

Risks from Interconnected Infrastructure

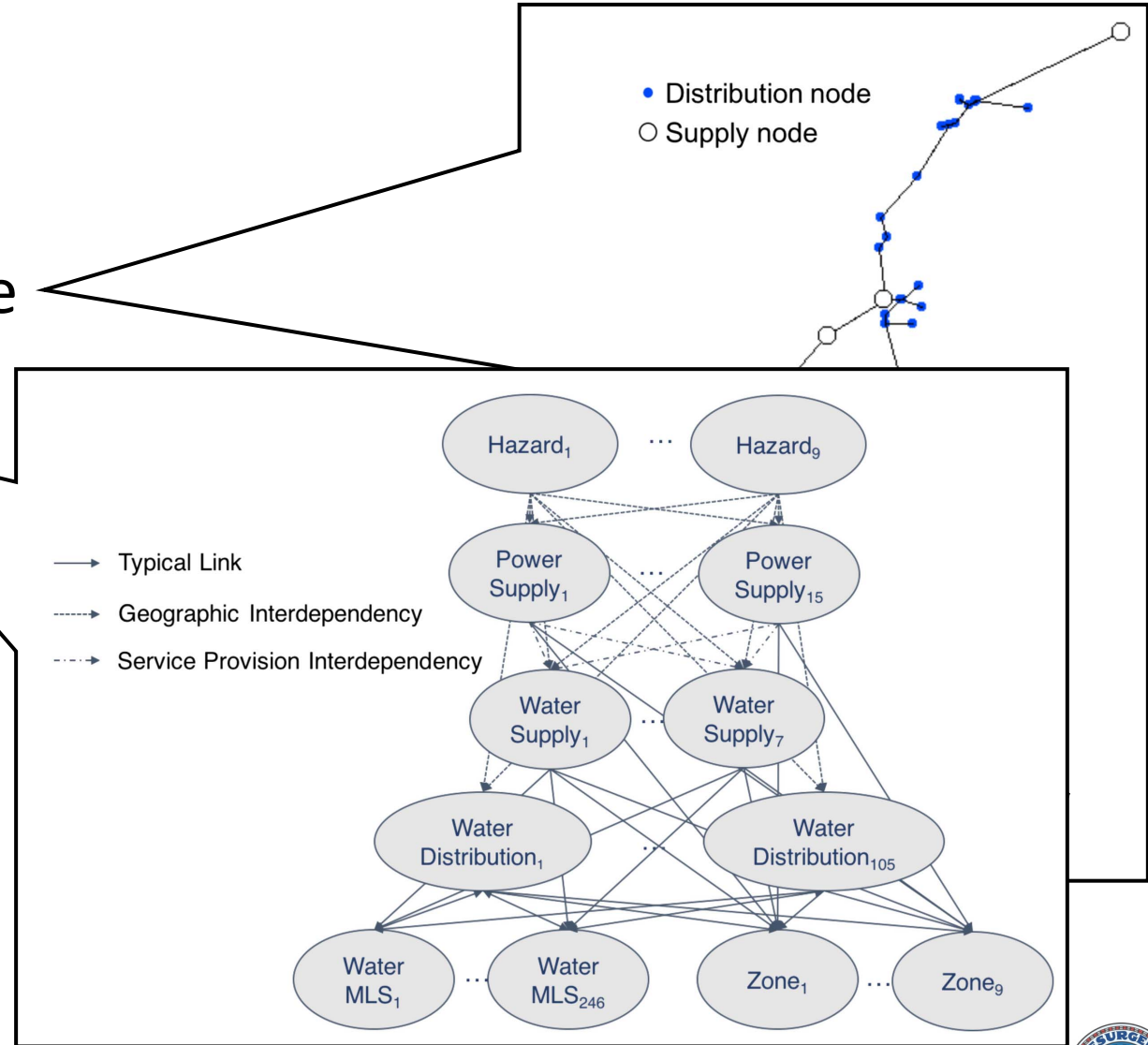
Problem statement from City perspective

- 1) What are the City's risks from interconnections between multiple infrastructure systems?
- 2) How do we decrease those risks and protect against attacks and failures?

Solution

- 1) Know where the connections are
- 2) Build a model of your system

What is connected to what
What depends on what

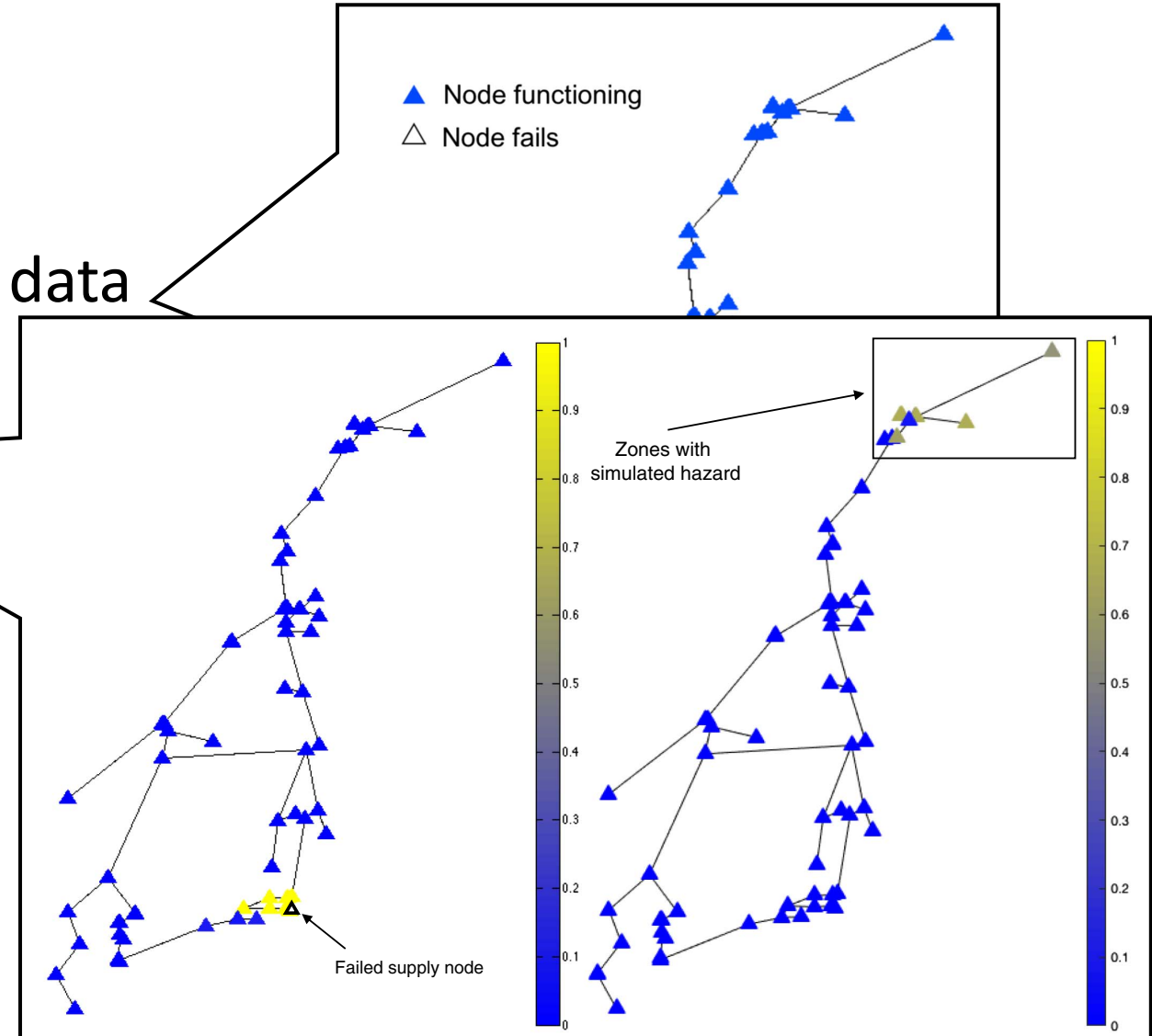


Solution

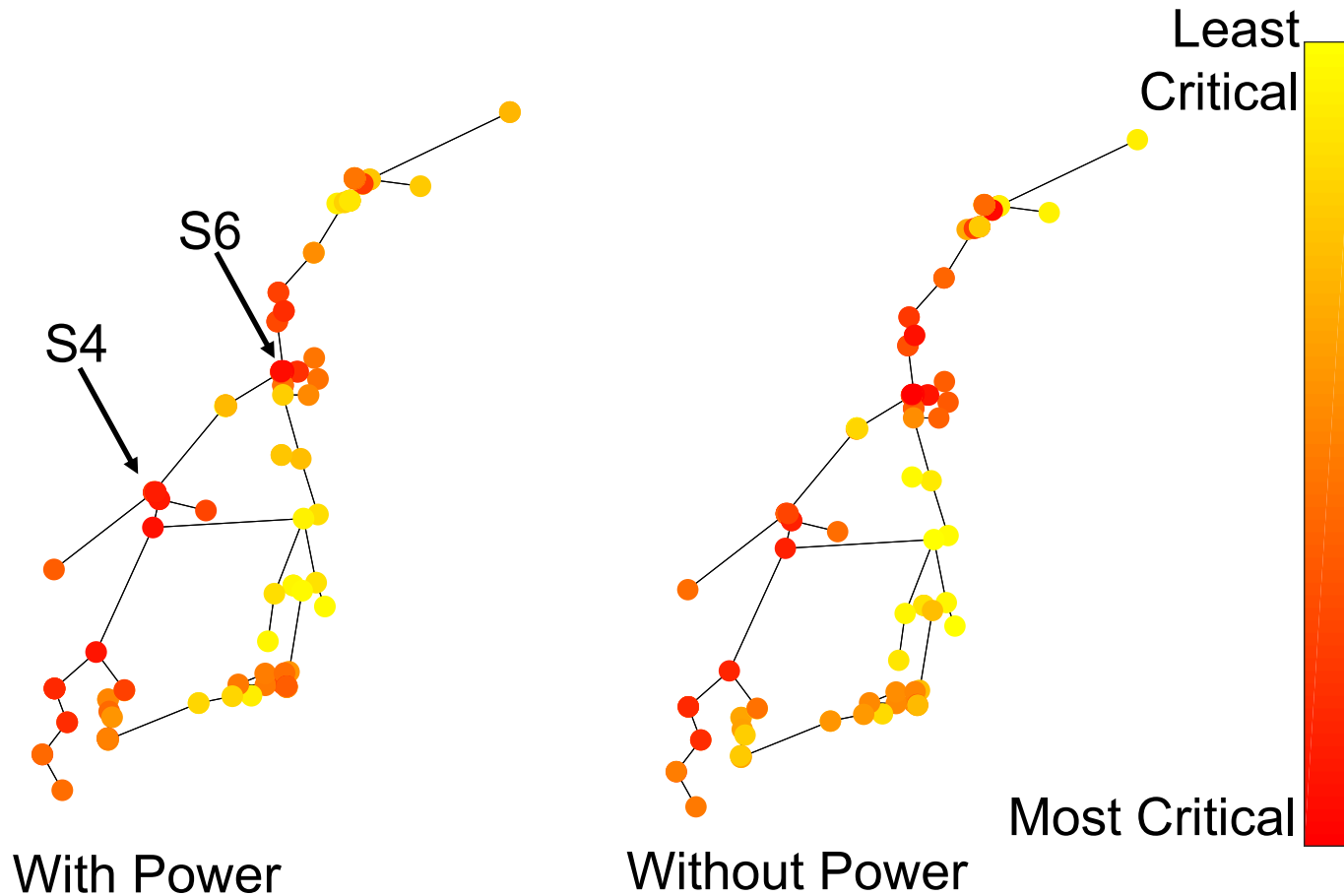
- 3) Test model with previous event data
- 4) Use model to predict what will happen in the future

What the connections will do

Outcome 1: risk scenarios



Outcome 2: find critical parts of system based on risk

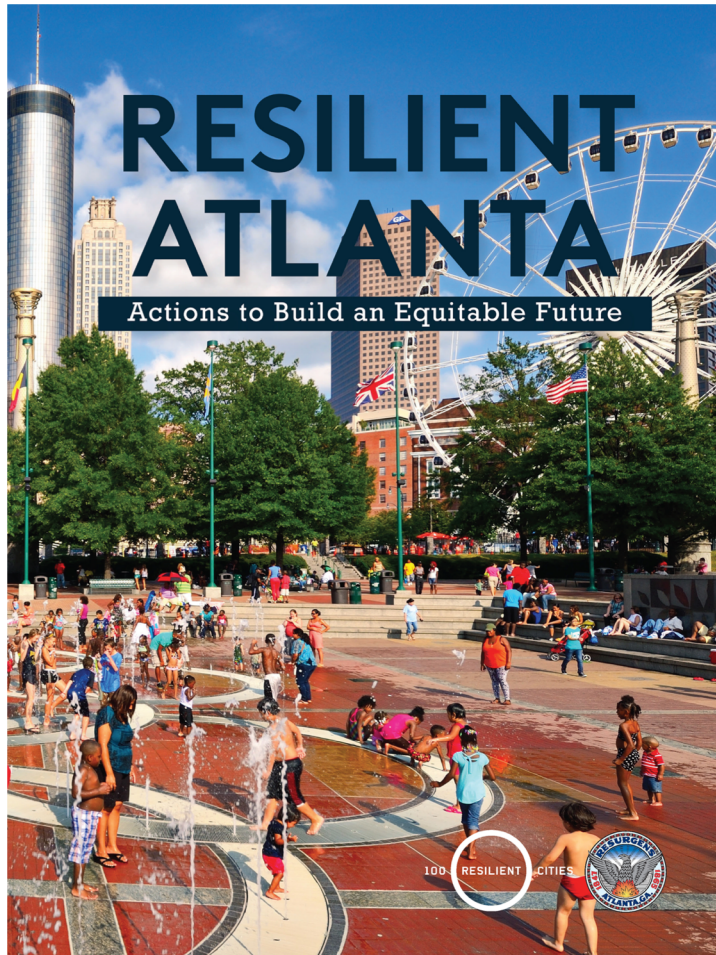


What's different about our solution

- Everything can be uncertain (unknown future)
- Can easily update risk assessments with new data
 - New inspections
 - New retrofits, e.g., install extra backup power supply at pumping station
 - Any other new information
- Includes infrastructure interconnections (interdependencies)



Impact of research: future investments



Action 4.1.2: Establish a system and evaluation process for joint infrastructure investments by 2020

Develop and implement a system and evaluation approach to City joint infrastructure investments that accounts for the benefits and efficiencies of coordinated investments across City departments and that could be funded through a coordinated capital plan, similar to that executed under the Renew Atlanta Bond Program. This process will promote long-term effectiveness and efficiency across operational departments. Under the leadership of a proposed City Joint Infrastructure Investment Committee, program and project investments will be evaluated, prioritized, and approved utilizing specific criteria designed to validate: (1) an efficient use of taxpayer dollars, (2) a consistent and measurable approach to planning and budgeting for joint infrastructure investments and sustained maintenance programs, and (3) a prioritization of investments that increase resilience and equity.

Resilience Value to Atlantans:



Primary Driver

Fosters Long-Term & Integrated Planning



Secondary Driver

Promotes Leadership & Effective Management

Lead Implementing Partners:

CoA Mayor's Office of Innovation and Delivery, All City general fund departments, Atlanta City Council, Local, state, federal grant funding agencies

Potential Metrics/Measures of Success:

- # of new cross-departmental programs implemented
- \$ change in long-term capital and operating budgets
- \$ change in short-term and long-term repair costs

Partnership

PI: How has working with industry partner informed or impacted your work?

- What decisions are possible, worth considering
- Probabilities (underlying #s) → impacts (why we care)

City: How did working with researcher change or inform how you will address future problems in your field?

- Shift in mindset (one system to many systems)
- Work across siloes, coordinated decisions

Unanticipated challenges and lessons learned

Researcher

- Data sharing across departments
- As early as possible, can shape possible research directions

Industry

- Changeovers in mayoral administrations and staffs
- Importance of handoffs and briefings for continuity

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