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

With Power

Without Power

Least Critical

Most Critical
What’s different about our solution

• Everything can be uncertain (unknown future)
• Can easily update risk assessments with new data
  o New inspections
  o New retrofits, e.g., install extra backup power supply at pumping station
  o 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

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<thead>
<tr>
<th>PI: How has working with industry partner informed or impacted your work?</th>
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<tr>
<td>• What decisions are possible, worth considering</td>
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<td>• Probabilities (underlying #s) (\Rightarrow) impacts (why we care)</td>
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<tr>
<th>City: How did working with researcher change or inform how you will address future problems in your field?</th>
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<tbody>
<tr>
<td>• Shift in mindset (one system to many systems)</td>
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<td>• Work across siloes, coordinated decisions</td>
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Unanticipated challenges and lessons learned

<table>
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<tr>
<th>Researcher</th>
<th>Industry</th>
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<tr>
<td>• Data sharing across departments</td>
<td>• Changeovers in mayoral administrations and staffs</td>
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<td>• As early as possible, can shape possible research directions</td>
<td>• Importance of handoffs and briefings for continuity</td>
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