RESILIENCE SOLUTIONS FOR FLOODING AND EXTREME WEATHER

Great Lakes and St. Lawrence Cities Initiative
2018 Annual Conference
Thursday, June 14, 2018
ABOUT DELTA INSTITUTE

Who we are: Multidisciplinary team of 20 FTE, including urban planners, civil engineers, economists, scientists, architects, LEED APs, GIS experts.

What we do: We collaborate with communities to solve complex environmental challenges throughout the Midwest.

How we do it:
• Work with public and private partners to identify opportunities for market-based environmental solutions
• Design, test, and share on-the-ground solutions that yield social, environmental, and economic benefits for communities.
CURRENT INITIATIVES

- Resilient Communities
- Sustainable Buildings
- Waste Reduction
- Regenerative Food Systems
- Land Stewardship
- Green Infrastructure

Resiliency planning and implementation in:
- Gary, Indiana,
- Hobart, Indiana
- Michigan City, Indiana
- Muskegon, Michigan
- Sebewaing, Michigan
- Tuscola, Michigan
WHY RESILIENCE?

Build capacity to deal with unexpected changes and come back stronger than before.

Integrates
• People
• Infrastructure & systems
• Environment
WHAT’S IN A RESILIENCE PLAN?

ENGAGE STAKEHOLDERS & IDENTIFY COMMUNITY ASSETS
- e.g. outdoor recreation, utilities

EVALUATE DISTURBANCES
- e.g. floods, demand for recreation

ASSESS VULNERABILITY
- e.g. sensitivity, capacity to adapt

Resilience Strategies

ADOPT PLAN & IMPLEMENT

VILLAGE OF SEBEWAING RESILIENCY PLAN
FEBRUARY 2017

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Don’t have to undertake a resilience plan to incorporate resiliency into your planning, operations, and maintenance.

Address resilience in:
• Transportation Plans
• Parks Plans
• Energy Plans
• Master Plans
Many municipalities already have tools that they can use to promote resiliency:

- **Zoning**
  - Floodplain – define and regulate
  - Parking – permeable surfaces
  - Underground wiring

- **Ordinances**
  - Siting utilities

- **Budgeting**
  - Capital improvements
SEBEWAING, MICHIGAN

- Population: 1,610
- On the coast of Saginaw Bay
- Challenges:
  - Increase intensity and duration of rainfall
  - Ice jams in Sebewaing River
  - Increase in straight line winds, lightning strikes, flooding
  - Aging utilities
SEBEWAING, MICHIGAN
FOCUS ON UTILITIES
# SEBEWAING, MICHIGAN

**FOCUS ON UTILITIES**

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<td><strong>Planning</strong></td>
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<tr>
<td>• Resilience Plan (2017)</td>
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<td>• Master Plan (2018)</td>
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<tr>
<td>• Zoning updates (2019)</td>
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<tr>
<td>• Install new CHP engines</td>
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<td>• Adopt new ordinance</td>
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<td>• Regulates siting and installation of new public utilities</td>
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Implemented Recommendation: Public Utility Siting Ordinance

Purpose: To regulate the use of land. Contains rules to regulate the vision described in the Master Plan. The zoning ordinance was reviewed for where resilience efforts could be incorporated.
GARY, INDIANA

- Population: 76,424
- On the coast of Lake Michigan
- Challenges:
  - Weather events
  - Urban run-off and stormwater management issues
  - Disinvestment and vacant land
  - Unclear municipal processes
GARY, INDIANA
FOCUS ON VACANT LAND

Solutions

Planning

• Gary Asset Mapping (2015)
• Green Infrastructure Plan (2016 - 2018)

Implementation

• Hybrid poplar forests for stormwater management
RESILIENCE IS A LONG-TERM PROCESS

PEOPLE

Engage stakeholders

INFRASTRUCTURE & SYSTEMS

Assess vulnerabilities in policy landscape and built assets

ENVIRONMENT

Understand ecological systems

Develop Goals

Rethink community institutions’ role
PEOPLE

• Who needs to be at the table when resilience planning?
• How can communities ensure planning for the most vulnerable populations?
• Who will benefit from resilience efforts?
INFRASTRUCTURE & SYSTEMS

• What are the global drivers and local impacts?
• How does the built environment provide opportunities/challenges?
• How can community institutions work together to layer resiliency into each aspect of planning, operations, maintenance?
ENVIRONMENT

• What should the system be resilient to?
  – Is the 100-year floodplain the right frame?

• How do people and systems interact and depend on ecological systems?
  – Residential use of water: drinking, washing
  – Commercial use of waterways: navigable channels
  – Recreational use of waterways: kayaking, swimming
RESOURCES

• Green Infrastructure Toolkit
  – Templates, plan sets, cross sections, costs, and material specifications
• Resilience Plans for Muskegon, Michigan and Sebewaing, Michigan
  – Examples of resilience assessments and analysis of disturbances
• Urban Tree Farms Toolkit (by end of 2018)
Planning and implementation of resilience efforts increasingly rely on cooperation from private and public parties.

Below are possible public funding sources:

- State Department of Environmental Quality
- National Oceanic and Atmospheric Administration
- EPASmart Growth Grants
- FEMA
  - Pre-Disaster Mitigation Program
  - Flood Mitigation Assistance Program
  - Hazard Mitigation Grant Program

* Programs may require applicant to have an approved Hazard Mitigation Plan
THANK YOU!

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