

APPROACHES TO RESILIENCE IN MICHIGAN: A NEW WAY FORWARD

Planning Michigan Conference
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ABOUT DELTA INSTITUTE

Who we are: Multidisciplinary team of 21 staff, 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.



**SUSTAINABLE
ENVIRONMENT.**



**SUSTAINABLE
ECONOMY.**

SEBEWAING, MICHIGAN



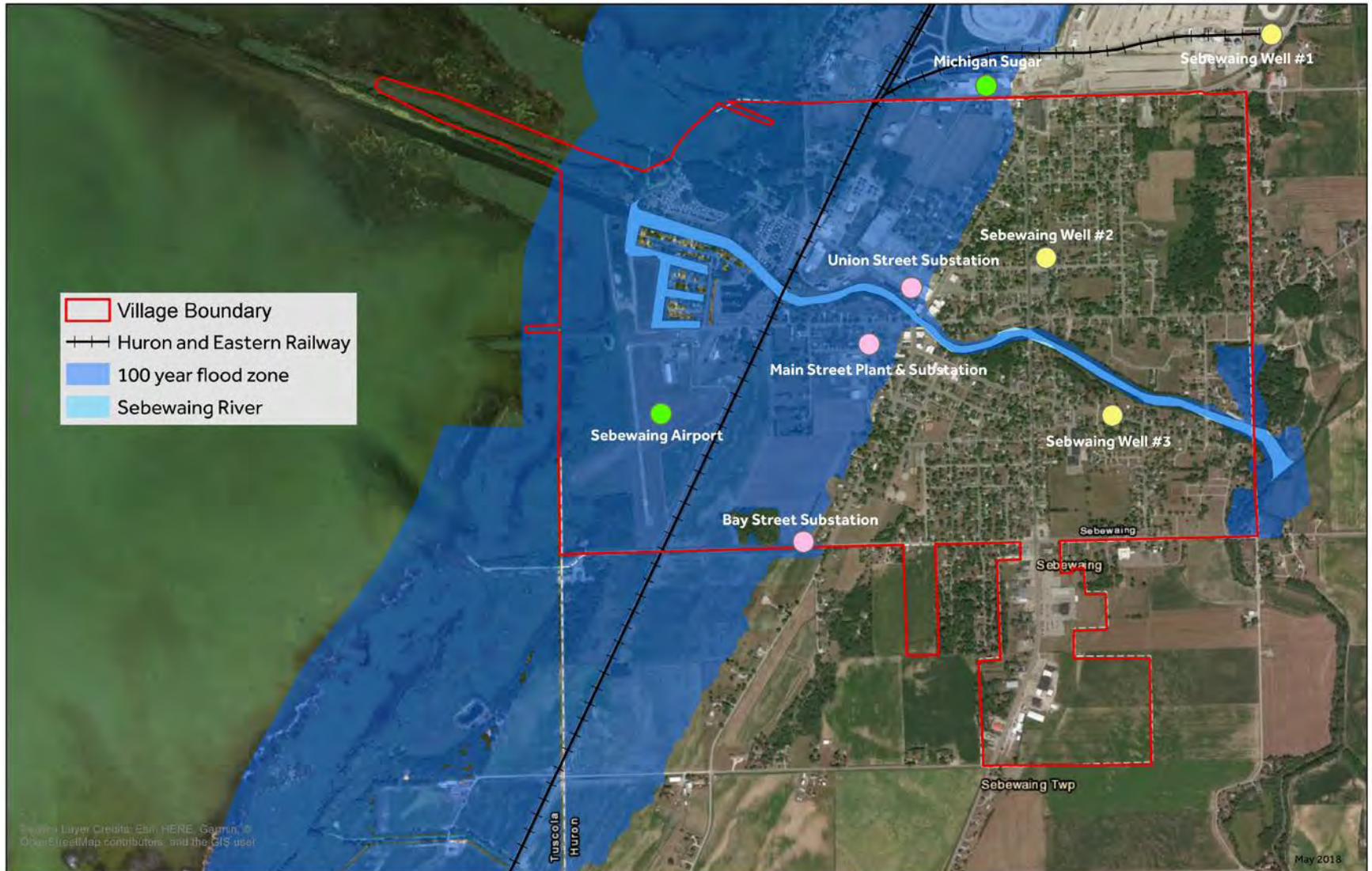
- Population: 1,610
- On the coast of Saginaw Bay
- Challenges:
 - Increase intensity and duration of rainfall
 - Ice jams in Sebewaing River
 - Increase in straight line winds, lightning strikes, flooding
 - Aging utilities

ICE JAMS ON THE SEBEWAING RIVER



Source: Mlive.com

RESILIENCY – FOCUS ON UTILITIES



WHAT'S IN SEBEWAING'S 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

Acknowledgements

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Vulnerability Levels of Assets	Resilience Strategies and Actions (Planning, Operational, and Capital Improvement)
Property value, roads, buildings	<p>Prevent development in sensitive areas and improve access;</p> <ul style="list-style-type: none"> • Rewrite Master Plan. • Amend and implement zoning ordinances. • Upgrade roads as needed for emergency access
All utility infrastructure	<p>Implement corrective measures to existing infrastructure to prevent damage from severe weather and flooding using both vegetative and built measures.</p> <ul style="list-style-type: none"> • Utilize green infrastructure • Ensure local storm water ordinances include resilience provisions • Retrofit/weatherize buildings • Provide generators at public facilities • Preplan for debris management
Backup power engines	<p>Improve reliability and redundancy of power engines.</p> <ul style="list-style-type: none"> • Create capital improvement program to purchase necessary equipment to provide both primary and backup power for the Village and industries.
Substations Lift Stations	<p>Implement corrective measures to existing infrastructure to prevent damage from severe weather and flooding using both vegetative and built measures.</p> <ul style="list-style-type: none"> • Retrofit/weatherize buildings • Continue to provide up to date water system reliability studies according to the Michigan Safe Water Drinking Act, PA 99 of 1976, as amended.

SEBEWAINING, MICHIGAN

Solutions

Planning

- Resilience Plan (2017)
- Master Plan (2018)
- Zoning updates *(future)*

Implementation

- Install new CHP engines
- Adopt new ordinance
 - Regulates siting and installation of new public utilities

ORDINANCE

In developing proposals to build, modify, or expand infrastructure for municipal utilities, the Village of Sebewaing and Sebewaing Light and Water Department shall:

- Seek to site new critical public infrastructure outside of the 100-year flood zone.
- Require that 100-year flood zone boundaries are mapped and used for siting purposes.
- Submit a plan for formal review through the public engagement process including cost, location, and timeline for installation of the proposed infrastructure.



HOW IT ALL FITS TOGETHER

SEBEWAING, MICHIGAN

Resilience Plan (2017)

Purpose: To guide the Village in the development and adoption of climate adaptation and resilience strategies.

Implemented Recommendation: Public Utility Siting Ordinance; CHP engines

Master Plan (2018)

Purpose: To reflect the ideas and vision of the community and to guide future development. Recommendations from the Resilience Plan are incorporated as Action Items in the Master Plan.

CONTINUE IMPLEMENTATION *(future)*

Update Zoning
(future)

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.

RESOURCES

- Agency resources
 - FEMA maps
 - Department of Environmental Quality
 - National Oceanic and Atmospheric Administration
- Community members knowledge
- Local leadership
- Tools
 - 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



GREEN INFRASTRUCTURE DESIGNS SCALABLE SOLUTIONS TO LOCAL CHALLENGES

JULY 2015

delta institute 

GUIDON 
SUSTAINABLE ARCHITECTURE + ENGINEERING DESIGN

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THANK YOU!

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