Workshop Three: USING COASTAL DATA TO IMPACT LOCAL PLANNING

Using Scenario Planning to Assess Land Use, Fiscal, and Environmental Impacts
BACKGROUND
# Scenario-Based Planning Framework

## Climate Futures

<table>
<thead>
<tr>
<th>Management Options</th>
<th>Climate Futures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lucky</td>
</tr>
<tr>
<td><strong>Current Development</strong></td>
<td>Scenario 1A</td>
</tr>
<tr>
<td><strong>Current Zoning Build-Out</strong></td>
<td>Scenario 2A</td>
</tr>
<tr>
<td><strong>BMP Build-Out</strong></td>
<td>Scenario 3A</td>
</tr>
</tbody>
</table>
Future Climate Conditions

- Possible climate futures (*not predictions*)

- Varying:
  - Storminess
  - Great Lakes still water levels

- Derived by:
  - FEMA FIRMs (existing & proposed – Coastal Flood Study)
  - Observed Lake Michigan water levels (gauge data)
  - Available Digital Elevation Models (DEM)

- “Planning storm” ~ 50 year storm
Growth Management Options

• Possible build-out futures (*not predictions*)
• Use current structures & infrastructure as a base
• Varying:
  – Zoning regulations & other growth policies
  – Allowable development in or near high risk flood areas
• Derived by:
  – Community master plan, zoning ordinance, and any other ordinances (e.g., stormwater management ordinance)
  – Spatial avoidance best management practices
  – CommunityViz software
GROWTH MANAGEMENT OPTIONS
Growth Management Options

- Current Structures & Infrastructure
- Potential Build Outs (Completed with CommunityViz)
  - Current Zoning Build-Out
  - BMP Build-Out
Coastal Resiliency Training Workshop
Coastal Resiliency Training Workshop

Current Zoning Build Out
- Single Family Residential
- Multi-Family Residential
- Non-Residential
- Building Footprints
- City of Grand Haven

Legend:

- Yellow: Single Family Residential
- Brown: Multi-Family Residential
- Orange: Non-Residential
- Black: Building Footprints
- Light Blue: City of Grand Haven

North

Scale: 0 - 0.2 - 0.4 - 0.8 Miles

Sources: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community
## Potential Build-Out Futures in High Risk Flood Areas

<table>
<thead>
<tr>
<th></th>
<th>Lucky</th>
<th>Expected</th>
<th>Perfect Storm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Development</strong></td>
<td>17</td>
<td>142</td>
<td>189</td>
</tr>
<tr>
<td><strong>Current Zoning Build-Out</strong>*</td>
<td>+1</td>
<td>+182</td>
<td>+234</td>
</tr>
<tr>
<td><strong>BMP Build-Out</strong>*</td>
<td>+2</td>
<td>+25</td>
<td>+41</td>
</tr>
</tbody>
</table>

* Additional potential structures in high risk flood areas
Takeaways from Potential Build-Outs

• Wetland & water buffer BMPs reduce the number of potential future structures at risk of being flooded

Other best management practices:

• Structural regulations
• Downzone development in high risk flooding areas
• Low Impact Development (LID) practices
FISCAL IMPACT ANALYSIS
Fiscal Impact: Total Property Value at Risk Under Each Climate Future

<table>
<thead>
<tr>
<th></th>
<th>Lucky</th>
<th>Expected</th>
<th>Perfect Storm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Development</td>
<td>~ $4 Million</td>
<td>~ $47 Million</td>
<td>~ $71 Million</td>
</tr>
<tr>
<td>Current Zoning Build-Out†</td>
<td>~$110 Million</td>
<td>~$310 Million</td>
<td>~$340 Million</td>
</tr>
<tr>
<td>BMP Build-Out†</td>
<td>~$17 Million</td>
<td>~$214 Million</td>
<td>~$230 Million</td>
</tr>
</tbody>
</table>

* The current total property value for the City of Grand Haven is about $2.4 Billion. So, Roughly 3% or less of the current total property value is at risk.

† Based on previously mapped climate futures
ENVIRONMENTAL ASSESSMENT
Environmental Assessment

- Total Acres of Tree Canopy:
  - 980.2 acres (~52% of Bridgman)
Environmental Assessment

- Total Acres of Wetlands:
  - 80 acres (~4% of Bridgman)
Environmental Assessment

- **Total Acres of Imperviousness:**
  - 341 acres (~18% of Bridgman)
Environmental Assessment

<table>
<thead>
<tr>
<th></th>
<th>% Tree Canopy</th>
<th>% Wetlands</th>
<th>% Impervious</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lucky</td>
<td>53%</td>
<td>26%</td>
<td>3%</td>
</tr>
<tr>
<td>Expected</td>
<td>44%</td>
<td>22%</td>
<td>6%</td>
</tr>
<tr>
<td>Perfect Storm</td>
<td>41%</td>
<td>17%</td>
<td>7%</td>
</tr>
<tr>
<td>Bridgman Total</td>
<td>52%</td>
<td>4%</td>
<td>18%</td>
</tr>
</tbody>
</table>
Environmental Assessment

<table>
<thead>
<tr>
<th></th>
<th>% Tree Canopy</th>
<th>% Wetlands</th>
<th>% Impervious</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lucky</td>
<td>53%</td>
<td>26%</td>
<td>3%</td>
</tr>
<tr>
<td>Expected</td>
<td>44%</td>
<td>22%</td>
<td>6%</td>
</tr>
<tr>
<td>Perfect Storm</td>
<td>41%</td>
<td>17%</td>
<td>7%</td>
</tr>
<tr>
<td>Bridgman Total</td>
<td>52%</td>
<td>4%</td>
<td>18%</td>
</tr>
</tbody>
</table>

**Takeaways:**

- Want % Tree Canopy and % Wetlands to trend up from Lucky to Perfect Storm
  - To help mitigate flooding, prevent runoff, and filter pollutants prior to entering water features

- Want % Impervious to trend down from Lucky to Perfect Storm
  - To reduce runoff vulnerability
Environmental Assessment

<table>
<thead>
<tr>
<th></th>
<th>% Tree Canopy</th>
<th>% Wetlands</th>
<th>% Impervious</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lucky</td>
<td>53%</td>
<td>26%</td>
<td>3%</td>
</tr>
<tr>
<td>Expected</td>
<td>44%</td>
<td>22%</td>
<td>6%</td>
</tr>
<tr>
<td>Perfect Storm</td>
<td>41%</td>
<td>17%</td>
<td>7%</td>
</tr>
<tr>
<td>Bridgman Total</td>
<td>52%</td>
<td>4%</td>
<td>18%</td>
</tr>
</tbody>
</table>

**Takeaways:**
- Want % Tree Canopy and % Wetlands to trend up from Lucky to Perfect Storm
  - To help mitigate flooding, prevent runoff, and filter pollutants prior to entering water features
- Want % Impervious to trend down from Lucky to Perfect Storm
  - To reduce runoff vulnerability

**IDEALLY:**
- A Lot More
- A Lot More
- A Little Less

Coastal Resiliency Training Workshop
CRITICAL DUNE AREAS
Coastal Resiliency Training Workshop

Grand Haven Charter Township's Fire and Rescue team have access such as the photo above to help access hard to reach areas. In the case of fire, however, large trucks are often needed to haul heavy equipment.

This condemned structure in Grand Haven Charter Township has been damaged by the natural movement of dune systems over time. Homes within the shorelands may be subject to erosion, sand movement, and other coastal dynamics.

Decades of development in the township’s dunes have created challenges for emergency response and fire department workers to reach homes.

The Wilderness community of the township prides itself on having a strong rural character built around the dunes, yet coastal residents often do not anticipate increased response times that their remote location causes for emergency service providers.

The Grand Haven Township Fire and Rescue Department has 7 full-time and 24 part-time staff. The average response time community-wide to emergencies is three minutes, but narrow roads in the dunes make it difficult and sometimes impossible for fire trucks to reach homes.
Bridgman, MI: State Designated Critical Dune Area

- Total Acres of Critical Dune Area:
  - 675.5 acres
  (~36% of Bridgman)
Coastal Resiliency Training Workshop

Bridgman, MI: Vacant Parcels in RL District

- Total Vacant Parcels in RL District Under 20,000 sqft:
  - 34 parcels
  (~43% of Vacant Parcels in RL District)
A significant amount of land located within the RL District, which is part of the state designated CDA, cannot be built on because of its slope.

- Areas where the slope is > 1 on 3 or 33%

Total Vacant Parcels in RL District that have steep slopes:
- 64 parcels (~81% of Vacant Parcels in RL District)

Total Vacant Parcels in RL District that have steep slopes AND small parcels:
- 29 parcels (~37% of Vacant Parcels in RL District)
QUESTIONS?