Local Land Use Strategies for Reducing Flood Risk

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Agenda

• Introductions
• Land use management tools
• Local comprehensive plans
• Case studies – land use planning
• Local land use regulations
• Case studies – zoning maps, site plans & regulatory language
• Wrap-up / Questions

Objective: Promote development patterns that reduce flood damage & protect the beneficial functions of flood-prone areas.
Land Use Management Tools

- Hurricane Harvey
Land Use Management Tools

• Municipal responsibilities:
  Protect health, safety, and welfare

• This should include integrating flood safety into community plans, policies, practices, regulations, and investment decisions.

Government has an affirmative duty to prevent harm.
Land Use Management Tools

• 44 Code of Federal Regulations § 60.1

Any community participating in the National Flood Insurance Program “must take into account flood, mudslide (i.e. mudflow) and flood-related erosion hazards, to the extent that they are known, in all official actions relating to land management and use.”
In formulating community development goals and in adopting flood plain management regulations, each community shall consider at least the following factors –

(1) Human safety;

(2) Diversion of development to areas safe from flooding in light of the need to reduce flood damages and in light of the need to prevent environmentally incompatible flood plain use;

(3) Full disclosure to all prospective and interested parties (including but not limited to purchasers and renters) that (i) certain structures are located within flood-prone areas, (ii) variances have been granted for certain structures located within flood-prone areas, and (iii) premium rates applied to new structures built at elevations below the base flood substantially increase as the elevation decreases;

(4) Adverse effects of flood plain development on existing development;” etc.
Land Use Management Tools

• Local plans
  • Hazard mitigation plan – Generally focused on existing risks
  • Comprehensive plan – Community vision. Goals and policies to achieve that vision.
  • Recovery planning – Strategy to build back safer and stronger.
  • Other – Economic development, infrastructure, watershed, etc.

• Local land use regulations
  • Zoning – Districts for different types of development
  • Site plan review – Proposed layout for a single parcel
  • Subdivision of land – Layout of lots and improvements
  • Other – Riparian buffers, stormwater, driveways, timber harvesting, etc.

Proactively manage land use patterns.
Local Comprehensive Plans

- **Expression of a community’s desires** – land use, housing, community services, public safety, economic development, transportation, infrastructure, natural resources
- **Guide to decision-makers** — blueprint for land use regulations
- **Legal document** – In NYS, adoption of zoning laws must in accordance with a comprehensive plan
Steps in Comprehensive Planning

- **Research** – existing conditions, future trends, potential problems
- **Community goals and objectives** – must strike a balance between multiple interdependent issues and diverse viewpoints
- **Policy formation** – land use regulations, capital projects, development guidelines, operating procedures
- **Plan implementation** – regulatory and non-regulatory actions
- **Review and updating**
Research: Flood Hazards

- Regulated floodplain
- Floodway, Coastal Barrier Resources System area, Otherwise Protected Area
- 500-year (0.2 % annual probability) floodplain
- Historic flooding, erosion, or drainage problems
- Flood insurance data
- Drainage infrastructure – bridges, culverts, stormwater practices
- Levees
- Dams

Planning starts with fact finding.
Research: Natural Features

- Rivers, streams, lakes, coasts
- Undeveloped floodplains and riparian buffers
- Wetlands
- Slope of the land
- Groundwater resources
- Parks and protected open space
- Other natural resource areas – forests, scenic vistas, critical habitat, recreation areas

Planning starts with fact finding.
Involve the Community

- **Effective communication** – Use lay terms. Focus on big issues (rather than technical details).
- **Maps** – Show streams, floodplains, other hazard information.
- **Historic flood photographs**
- **Stress safety issues**

Public engagement is essential for developing an effective comprehensive plan.
Flood Resilience Strategies

• Manage water where it falls
• Make room for water
• Live with floods
• Educate the public

It is the civic duty of local governments to protect the health, safety, and welfare of the people who are served.

Each community is challenged with finding the appropriate balance between environmental, economic, and social concerns.
Comprehensive Plan

• **Vision** for a safe community
  • Protect life and property
  • Floodplains are meant to flood
  • Make room for water

• Develop **goals and objectives** that aim high
  • Identify high risk areas that should be kept free of development
  • Protect natural features that reduce flooding
  • Future land use map

• Develop feasible **recommendations**
  • Regulations, municipal operations, outreach, funding needs
Case Studies – Land Use Planning

**Assignment:** Develop recommendations for land use planning in communities for which flood risk reduction appears to conflict with other community objectives.

- Group 1: Small levee-protected city
- Group 2: Town with a flood-prone hamlet
- Group 3: Historic Main Street in floodplain
- Group 4: Small flood-prone village
Case Studies – Land Use Planning

1. **Research:** What maps and information can be assembled to support incorporation of flood resiliency into the Comprehensive Plan?

2. **Community engagement:** Suggest strategies for including flood risks in the public engagement process in order to solicit suggestions from citizens, elected officials, community leaders, and those who own or use flood-prone property.

3. **Recommendations:** What are your suggestions for how this community can balance flood risks with other community objectives?
Case Study 1 – Levee-Protected City

Levee-protected area

Regulated floodplain

Levees overtopped in 1972
Case Study 2 – Flood-Prone Hamlet

Hamlet located in Special Flood Hazard Area

Comprehensive Plan Goal: “Revitalize the Hamlet area.”

Hamlet subject to repeated shallow flooding
Case Study 3 – Historic Main Street in Floodplain

Historic Main Street is protected by levees AND is in the regulated floodplain
Case Study 4 – Small Flood-Prone Village

Floodplain at confluence of a creek and a river

Repeated flooding from river and stream

High sediment loads from upstream erosion

1972

2011
Break
Local Land Use Regulations

Police Power

✓ Power to regulate for the purpose of the public health, safety, welfare, comfort, peace and prosperity
✓ The regulation of floodplains is for public safety
✓ So long as it is reasonable and not “arbitrary and capricious”
Home Rule versus the Dillon’s Rule
Where do municipalities get their authority?

Article IX of the State Constitution
  • Bill of Rights for Local Governments

Municipal Home Rule Law

Statute of Local Governments
Local Land Use Regulations

1. Zoning
2. Subdivision of Land
3. Site Plan Review
Zoning

The way land in a municipality is used and developed.

• the uses to which property may be devoted
• the siting of development on land
• the density of development on property
Zoning Examples

- Zoning districts/special use permits
- Incentive zoning (bonus zoning)
- Overlay zoning
- Performance or incentive zoning
- Floating zones
- Planned Unit development
- Transfer of Development Rights
Flood/Floodplain Zoning District

- Density controls (e.g., minimum lot sizes of 5 acres or larger)
- Uses that may be incompatible with flood risks
- Open space uses
- Conservation zone
Town of Eden - Zoning

Current Zoning:
- Rural Residential
- Agricultural
- Conservation
- General Business
- General Industrial
- Hamlet Residential
- Local Business
- Suburban Residential
- Office Business
- Planned Industrial
- Other

Province of Ontario, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, NSA, EPA, USDA, AAPG, NRCAN
Special Permits

• Conditional use in the land use district (e.g., cluster residential development)
Overlay Zoning

Common set of standards that apply to a designated area within several different “underlying districts”
✓ Floodplain management regulations

The standards of the overlay zone apply in addition to those of the underlying zoning district(s):
• Use restrictions (e.g. new construction, critical facilities, hazardous materials)
• Landscaping requirements (such as green infrastructure)
• Setback standards from streams (or environmentally sensitive areas)
Require green infrastructure and low-impact development techniques:

1) **Avoid** or minimize disturbance by preserving natural features and using conservation design techniques.
2) **Reduce** the impacts of development by decreasing impervious cover.
3) **Manage** the impacts of development by using natural features and runoff reduction practices to slow down the runoff, promote infiltration and evapotranspiration, and minimize the need for structural “end-of-pipe” practices.
Incentive Zoning

Development Incentive Bonuses - community benefits or amenities

*Examples*

- Public pedestrian and/or vehicular access to the waterfront and to water-dependent uses
- Publicly accessible waterfront promenades, pedestrian linkages, nature preserves, hiking and blue trails
- Publicly accessible open space and play areas, particularly on or close to the waterfront
- Restoration of wetlands
- Protect or restore connectivity between natural areas where needed to support ecosystem function
Floating Zones

- The standards and allowable uses for a floating zone are set forth in the text of the municipality’s zoning regulations, but the actual district is not mapped.
- The district “floats” in the abstract until a development proposal is made for a specific parcel of land and the project is determined to be in accordance with all of the applicable floating zone standards.
- At that time the municipality maps the floating zone by attaching it to a particular parcel or parcels on the zoning map.
Planned Unit Development

Mixed-Use PUD Concept

- Roadway network allows for future connections to surrounding properties
- Network of trails links uses and open spaces
- Modified grid of streets enhances connectivity for both pedestrian and vehicular traffic
- Centralized "Village Green"
- Existing wooded area integrated into plan as an open space/park
- Small plaza spaces and widened sidewalks integrated into all non-residential developments
- Coordinated access
- Focal Plaza
- Woods area and wetlands preserved as an amenity
- Existing drainage retained and enhanced as a greenway & trail corridor
- Village "Main Street"

CONCEPTUAL MAP LEGEND
- Retail/Restaurant (20%)
- Office (6%)
- Lowrise/walk-up apartments (8%)
- Townhouses (46%)
- Single Family (17%)

R1 ≤ 7.5

To I-5
Transfer of Development Rights

- **Sending Parcels**: Transfer existing development or development potential from sensitive remote parcels.
- **Receiving Parcels**: Transfer bonus incentives and development rights to Town Centers.
Subdivision of Land

How land is used - ensure that when development does occur, it will be accompanied by adequate services and facilities

Source: Subdivision Review in New York State
Common Subdivision Standards

- Lot layout
- Physical character of the land
- Environmentally sensitive lands
- Street layout
- Interconnected network of streets
- Utilities
- Bicycle lanes
- Sidewalks and curbs
- Water supply and sewage disposal systems
- Stormwater runoff
- Building design
- Other improvements such as lighting
Procedure

- Due Diligence and the Pre-Sketch Plan Meeting
- Sketch Plan
- Preliminary Plan
- Final Plat Approval
- Post-Approval Management
Locally adopted subdivision regulations for flood risk

Geographic Features

- Waterbodies without Identified Floodplains
- Riparian Areas
- Alluvial Fans
- Dams
- Levees

Source: Subdivision Design and Flood Hazard Areas (PAS 584)
Layout and Design

• Impact Analysis and Mitigation
• Use Restrictions

Infrastructure

• Ingress and Egress
• Local Road Systems
• Utilities

Source: Subdivision Design and Flood Hazard Areas (PAS 584)
Watershed Management
Cluster Development/Conservation Subdivision

• Needs to be outlined in subdivision regulations
• Consider “by-right” development option

Source: Subdivision Review in New York State
Site Plan Review

• Component of a zoning ordinance or separate enactment

• Review can apply to general class of uses (drive-in facility such as a fast food restaurant, bank or neighborhood convenience retailer) or to a proposed action in a particular area (coastal zone)
Site Plan Review

1. Illustrates the intended design, arrangement, and uses of the land to be improved

2. Describes the proposal’s physical, social and economic effects on the community
Typical Development Considerations

- Means of access
- Parking
- Landscaping
- Buffers
- Architectural features
- Location of structures
- Impact on adjacent land uses and other elements related to the health, safety and general welfare of the community
Review standards related to flood safety

• Preserve buffers along streams, rivers, shorelines, and wetlands.
• Avoid disturbance of sensitive resource areas by locating development to fit the terrain in areas that will create the least impact.
• Whenever practical, structures should not be located in the 100-year floodplain (e.g., 1% annual probability flood zone) or in a drainageway.
• Any development within the 100-year floodplain (e.g., 1% annual probability flood zone) shall comply with all provisions in the municipal Local Law for Flood Damage Prevention.
• New streets should be located outside of the 100-year floodplain (e.g. 1 % annual probability flood zone) or elevated to or above the base flood elevation when necessary to enable emergency vehicle access during a flood.
• Critical facilities should be kept out of the 100- and 500-year floodplain if at all possible. Stormwater and drainage facilities shall be adequate for runoff reduction and treatment; provisions shall be made for long-term maintenance of any permanent stormwater management practices.
Architectural Considerations – Resiliency

- Basement
- Flood openings
- Elevate/floodproof building utilities
- Flood damage-resistant materials
- Barrier measures

Source: Reducing Flood Risk to Residential Buildings That Cannot Be Elevated
<table>
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<tr>
<th>Item Number</th>
<th>Site Plan Review Checklist</th>
<th>Green Infrastructure Techniques</th>
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| 4.          | Location, design and type of construction of all parking and truck loading areas, showing access and egress. | ☐ Roadway reduction – Minimize roadway widths and lengths to reduce site impervious area.  
☐ Driveway reduction – Minimize driveway lengths and widths to reduce site impervious area.  
☐ Cul-de-sac reduction – Minimize the number of cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.  
☐ Parking reduction – Reduce imperviousness on parking lots by eliminating unneeded spaces, providing compact car spaces and efficient parking lanes, minimizing stall dimensions, using porous pavement surfaces in overflow parking areas, and using multi-storied parking decks where appropriate.  
☐ Porous Pavement – Previous types of pavements that provide an alternative to conventional paved surfaces, designed to infiltrate rainfall through the surface, thereby reducing stormwater runoff from a site and providing some pollutant uptake in the underlying soils. |
| 5.          | Provision for pedestrian access.                                                         | ☐ Sidewalk reduction – Minimize sidewalk lengths and widths to reduce site impervious area. |
Model Intermunicipal Floodplain Overlay District Local Law

Through funds provided by the Environmental Protection Fund under the authority of the New York Ocean and Great Lakes Ecosystem Conservation Act and by agreement with New York Sea Grant, GFLRPC has been awarded funding from the New York’s Great Lakes Basin Small Grants Program for the Model Intermunicipal Floodplain Overlay District Local Law project.

The purpose of the Model Intermunicipal Floodplain Overlay District Local Law project is to create a ready-to-use local law that promotes the No Adverse Impact approach to floodplain management by encouraging neighboring municipalities to coordinate during the planning and development review process in order to prevent increases in flood damage to other properties. This model local law will incorporate intermunicipal project review, such as those commonly found useful in the General Municipal Law 5298 Referral Process that promotes the coordination of land use decision-making and enhances consideration of potential intermunicipal and county-wide impacts, to foster a program that is effective in reducing and preventing flood problems. The overlay district aims to create more socially and environmentally responsible development beyond the floodplain; managing development in the watershed where floodwaters originate while still allowing the local government to have significant control over the approval process.

A Steering Committee will be formed to advise the drafting of this model local law. GFLRPC will research and gather information, serve as the facilitator for the Steering Committee, and draft the model local law.

The Model Intermunicipal Floodplain Overlay District Local Law project is based on recommendations from the Flood Smart Action Plan. Recommendation 3 of the Flood Smart Action Plan is to “Adopt intermunicipal floodplain protection overlay district (PDA) to require additional and intermunicipal review of site plans for building permits.” The intent of this project is to create a customizable template for an intermunicipal overlay district focusing on development in the floodplain for use by any interested municipality in New York State.

Model Ordinances
- Model Floodplain Protection Overlay District Intermunicipal Agreement
- Model Floodplain Protection Overlay District Intermunicipal Agreement
Sample Site Development Plan Review Checklist

To be used along with submission requirements for general Site Plan Review. This checklist applies to parcels of land that experience localized flooding.

Technical Considerations Satisfied:

☐ Location, width and purpose/description of all existing and proposed easements, setbacks, reservations, and areas dedicated to public use within and adjoining the property, such as conservation or drainage easements
☐ Fences, locations, elevations, and widths of adjacent streets
☐ Building elevations of adjoining parcels
☐ Conformity with local flood damage prevention, wetlands protection, and conservation development regulations
☐ Conformity with local hazard mitigation plan

Impact on Environments Satisfied:

☐ Use of future conditions—both land use and hydrology
☐ Identify levee protection areas
☐ Identify dam failure areas
☐ Flood response/evacuation plan

Existing Natural Features Satisfied:

☐ Location of floodplains adjacent to all stream channels (e.g., floodways, 1 percent annual chance and 0.2 percent annual chance floodplains), including Base Flood Elevations (BFE)
☐ Map waterbodies without identified floodplains (e.g., ditches, ponds, lakes)
☐ Hydrologic features, including all perennial and intermittent streams
☐ Natural grade elevation related to floodprone areas
☐ Geologic features, such as depth to groundwater and aquifers
☐ Topography at two-foot contour intervals

☐ Soil characteristics, such as field indicators of hydric soils and drainage capacity
☐ Vegetation, including all clearing, filling, and other proposed changes to the ground
☐ In V zones (coastal high hazard areas), the line of the mean high tide and Zone V/Zone A boundary if there is more than one Zone on the lot, the BFE and boundary locations should be depicted on the plans.
☐ Habitat assessment

Proposed Development:

☐ Retention and detention facilities based on the 24-hour, 100-year storm
☐ Location, elevation, and arrangement of site access and egress, including all paths for pedestrian and vehicular travel within the site
☐ Landscaping plans, including riparian buffer areas
☐ Architectural plans (e.g., building anchoring standards, utility standards)
☐ Materials specifications (e.g., identify flood resistant materials for areas below BFE + 2', flood vents)

Are any of the following located in a flood hazard area?

☐ Decks, access stairs and elevators, fences, retaining walls, swimming pools, or accessory buildings
☐ Underground electric connections serving lots
☐ Hazardous materials (e.g., storage tanks, on-site sewage disposal components)
☐ Wellheads for water
☐ Local road systems
Case Studies –
Zoning Maps, Site Plans, & Regulatory Language

1. How can the Land Conservation District be improved to accomplish better floodplain management?
2. How can establishing a riparian buffer be accomplished?
3. How can the flood damage prevention ordinance be improved?
4. Since a majority of the flood hazard area lies within residential zoning districts, how can incentives be incorporated into land use regulations?
Wrap-up / Questions
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