Flood Resilience
Zoning Text Update

Natural Resources Protective Association
September 5, 2017
A more resilient NYC is one where neighborhoods, buildings and infrastructure can withstand and recover quickly from flooding and climate events.

Coastal defenses are strengthened as first line of defense against flooding and sea level rise.

Buildings are designed to withstand and recover from flooding.

Infrastructure is protected from climate hazards.

Residents and businesses are prepared.
NYC’s flood risk is high.
The floodplain affects a large geography and most community and council districts.

100 Year Floodplain
FEMA 2015 PFIRM

Population: **400,000**
Buildings: **71,500**

50 of 59 Community Boards
45 of 51 Council Districts

- **Buildings:**
  - 80% 1-4 units
  - 7% 5+ units
  - 13% nonresidential

- **Residential Units:**
  - 30% 1-4 units
  - 70% 5+ units
FEMA Flood Map
Citywide Flood Risk

Population in Floodplain

<table>
<thead>
<tr>
<th>Year</th>
<th>Staten Island</th>
<th>Citywide</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>18,100</td>
<td>218,000</td>
</tr>
<tr>
<td>2013</td>
<td>30,700</td>
<td>400,000</td>
</tr>
<tr>
<td>2020s</td>
<td>38,600</td>
<td>605,300</td>
</tr>
<tr>
<td>2050s</td>
<td>44,900</td>
<td>808,900</td>
</tr>
<tr>
<td>2080s</td>
<td>56,300</td>
<td>1,113,500</td>
</tr>
<tr>
<td>2100</td>
<td>63,100</td>
<td>1,259,100</td>
</tr>
</tbody>
</table>

Buildings in Floodplain

<table>
<thead>
<tr>
<th>Year</th>
<th>Staten Island</th>
<th>Citywide</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>8,000</td>
<td>35,000</td>
</tr>
<tr>
<td>2013</td>
<td>11,800</td>
<td>71,500</td>
</tr>
<tr>
<td>2020s</td>
<td>14,200</td>
<td>93,600</td>
</tr>
<tr>
<td>2050s</td>
<td>16,700</td>
<td>118,000</td>
</tr>
<tr>
<td>2080s</td>
<td>19,800</td>
<td>152,900</td>
</tr>
<tr>
<td>2100</td>
<td>21,500</td>
<td>171,800</td>
</tr>
</tbody>
</table>

*Future flood zone impacts based on NPCC2 90th percentile sea level rise projections

2015 PFIRMs

2015 Projected 100 year flood plain

2050 Projected 100 year flood plain

46% increase

100% increase

41.5% increase

59% increase

FEMA Flood Map
Citywide Flood Risk

*2015 PFIRMs 2050 Projected 100 year flood plain

*Future flood zone impacts based on NPCC2 90th percentile sea level rise projections
Flood Resilience Zoning
Projects at DCP

2013
“Flood Text”
initial temporary regulations
to facilitate recovery

2018
“Flood Text Update”
improve upon, and make
permanent, the Flood Text
How are buildings in the floodplain regulated?

Flood Insurance Rate Maps (FIRMs)
- Determine where floodplain regulations apply

National Flood Insurance Program
- Set up Insurance Rates depending on building elevation and other requirements

Construction Standards (ASCE 24)
- Design minimum construction requirements for flood hazard areas

Building Code (DOB)
- Requires new buildings and substantial improvements to meet FEMA standards

Zoning Resolution (DCP)
- Zoning accommodates these regulations and improves neighborhood character
Flood resilient construction
Required by DOB

**Required** for all **new** buildings

**Not required** for **existing** buildings
(unless substantially damaged or improved)

**Building Code (DOB)**
**Requires** new buildings and substantial improvements to meet FEMA standards

*Substantially Damaged: Restoring Cost ≥ 50% Market Value*
*Substantially Improved: Improvement Cost ≥ 50% Market Value*
Flood resilient construction standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the Design Flood Elevation (DFE).

- Living spaces are elevated above DFE
- Site is filled to lowest adjacent grade
- Mechanical systems are elevated above DFE
- Use below DFE is restricted to parking, storage or access
- WET FLOODPROOF (Water comes in and out)
Flood insurance rates
Set by FEMA

Raising or retrofitting your building or home will reduce costs

FEMA’s flood insurance premiums are lowest when the lowest inhabited floor (any area not used solely for storage, access or parking) is elevated above the Base Flood Elevation (BFE).

- **4 FEET OR MORE BELOW BFE**: ~$9,000 Annual premium
- **AT BFE**: ~$1,400 Annual premium
- **3 FEET OR MORE ABOVE BFE**: ~$450 Annual premium
2013 Citywide Flood Text
Amended zoning in six key areas

1. **Height**
   - Measured from flood elevation

2. **Access**
   - Flexibility for stairs, ramps, lifts

3. **Parking**
   - Flexibility to relocate parking

4. **Systems**
   - Flexibility to relocate/elevate

5. **Ground Floors**
   - Account for costs of new flood risk

6. **Streetscape**
   - Require features to mitigate blank wall
2015 Special Regulations
Accelerate recovery in Sandy-damaged neighborhoods

Temporary regulations, expiring in 2020, in limited areas of Brooklyn, Queens, and Staten Island
2015 Special Regulations
Accelerate recovery in Sandy-damaged neighborhoods

Provided new zoning solutions in three key areas:

**Simplified process**
for documenting old homes

**Removed disincentives**
such as loss of basement space

**Established new envelope**
for rebuilds on small existing lots

Home in Gerritsen Beach
© Google 2015

1931 Sanborn Map
Used with permission from
The Sanborn Library, LLC
### Lessons learned since 2013

**Construction/retrofitting activity in the flood zone:**

The zoning relief we provided may not be achieving our goal of increasing code-compliant, flood-resistant projects.

**DOB Permit Filings**
in the flood hazard area, 10/2013 – 1/26/2016

<table>
<thead>
<tr>
<th></th>
<th>New Buildings</th>
<th>Major Alterations</th>
<th>Minor Alterations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NB</strong></td>
<td>1,021</td>
<td>1,090</td>
<td>15,573</td>
</tr>
<tr>
<td><strong>Alt-1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Alt-2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All 1,021 (100%) meet full resiliency standards</td>
<td>100%</td>
<td>10%</td>
<td>3%</td>
</tr>
<tr>
<td>149 (14%) approved</td>
<td>36 (31%) approved</td>
<td>245 (46%) approved</td>
<td></td>
</tr>
<tr>
<td>451 (44%) underway</td>
<td>24 (21%) underway</td>
<td>122 (23%) underway</td>
<td></td>
</tr>
<tr>
<td>179 (17%) complete</td>
<td>0 (0%) complete</td>
<td>9 (1%) complete</td>
<td></td>
</tr>
<tr>
<td>25% rejected/pending</td>
<td>48% rejected/pending</td>
<td>30% rejected/pending</td>
<td></td>
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</table>
Flood Text II
Need for a new citywide text amendment:

1. Make the provisions of the current, temporary 2013 Flood Text permanent

2. Fix and improve provisions based on studies and lessons learned in six key areas

3. Begin to promote new development + proactive retrofitting to high resiliency standards

4. Encourage good resilient construction that enhances the character of coastal communities
**Flood Text II**

**Zoning and land use strategies**

**Limit**
Zoning and other tools should limit exposure to damage and disruption by limiting the density of future development.

**Accommodate**
Adjust zoning to allow buildings to retrofit, by providing flexibility and removing obstacles to resiliency investments.

**Encourage**
Encourage construction of new development built to a higher standard of flood protection.

Where flood risk is exceptional, including where sea level rise will lead to future daily tidal flooding.

Where risk from extreme events can be managed and infrastructure and context support growth.

*stakeholder input factored into zoning and land-use strategy throughout*
Flood Text II
Fix and improve provisions based on lessons learned

1. **Height**
   Homeowners may face the loss of subgrade spaces when retrofitting.

2. **Height**
   Property owners may want to address future risk by over-elevating.

3. **Ground Floors**
   Current incentives to keep active ground floors may not be enough.

4. **Homes in M Districts**
   Existing homes in M. Districts, if damaged, may not be able to rebuild.

5. **Old Homes in Small Lots**
   Old homes on small lots may need more flexibility to rebuild in the future.

6. **Improve Streetscape**
   Mitigate the effects of elevated buildings on neighborhood character.
DCP plans a robust public engagement process:

As part of this outreach process, DCP will:

- **Partner with stakeholders** to educate and promote awareness of flood risk and resiliency issues
- **Explain how zoning tools** relate to resiliency
- **Explore unique neighborhood issues** through in-depth public presentations and workshops
- Develop a proposal through an **iterative process** that is shaped by feedback

*Schedule is tentative and subject to change*
Outreach Resources

NYC Flood Hazard Mapper
www.nyc.gov/floodhazardmapper

Info briefs on Flood Resilience Zoning, Flood Risk, Flood Resilient Construction, and Flood Insurance
www.nyc.gov/resilientneighborhoods
Thank you!

For more information, and to stay involved, email resilientneighborhoods@planning.nyc.gov