Flood Resilience
Zoning Text Update

Manhattan Community Board 6
Land Use Committee
June 7, 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

Units:
- 30% 1-4 units
- 70% 5+ units
FEMA Flood Map
Flood Risk in Manhattan

<table>
<thead>
<tr>
<th>2015 PFIRMs</th>
<th>Population in Floodplain</th>
<th>Buildings in Floodplain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>89,100</td>
<td>3,100</td>
</tr>
</tbody>
</table>
Future Flood Map
Flood Risk in Manhattan

<table>
<thead>
<tr>
<th></th>
<th>2015 PFIRMs</th>
<th>2050s Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population in Floodplain</td>
<td>89,100</td>
<td>214,500</td>
</tr>
<tr>
<td>Buildings in Floodplain</td>
<td>3,100</td>
<td>5,900</td>
</tr>
</tbody>
</table>

140% increase
90% increase
### Future Flood Risk

#### Flood Risk in MN CB 6

<table>
<thead>
<tr>
<th></th>
<th>2015 PFIRMS</th>
<th>2050’s Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td>R units in floodplain</td>
<td>18,394</td>
<td>20,905</td>
</tr>
<tr>
<td>Buildings in floodplain</td>
<td>163</td>
<td>255</td>
</tr>
<tr>
<td>% buildings in MN CB 6</td>
<td>5%</td>
<td>8%</td>
</tr>
</tbody>
</table>

**Change:**
- R units in floodplain: 14%
- Buildings in floodplain: 56%

**Legend:**
- 1% Annual Chance: Preliminary FIRM
- Future 1% Annual Chance: 2050’s Projection
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 standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the Design Flood Elevation (DFE).
Flood resilient construction
Examples of Residential Buildings

Residential Building
with access at grade (wet-floodproofed)

Residential Building
Elevated to DFE – 3’ above grade
Flood resilient construction standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the Design Flood Elevation (DFE).
Flood resilient construction
Examples of Commercial Buildings

Commercial Ground Floor
Existing Building with access at grade (deployable flood shields)

Commercial Ground Floor
Elevated Retail
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
**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>Category</th>
<th>New Buildings</th>
<th>Major Alterations</th>
<th>Minor Alterations</th>
</tr>
</thead>
<tbody>
<tr>
<td>NB</td>
<td>1,021</td>
<td>1,090</td>
<td>15,573</td>
</tr>
<tr>
<td>Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>1,021 (100%)</td>
<td>Only 113 (10%)</td>
<td>Only 532 (3%)</td>
</tr>
<tr>
<td>meet full</td>
<td></td>
<td>meet full</td>
<td>meet full</td>
</tr>
<tr>
<td>resiliency</td>
<td></td>
<td>resiliency</td>
<td>resiliency</td>
</tr>
<tr>
<td>standards</td>
<td></td>
<td>standards</td>
<td>standards</td>
</tr>
<tr>
<td>Approved</td>
<td>149 (14%)</td>
<td>36 (31%)</td>
<td>245 (46%)</td>
</tr>
<tr>
<td>Underway</td>
<td>451 (44%)</td>
<td>24 (21%)</td>
<td>122 (23%)</td>
</tr>
<tr>
<td>Complete</td>
<td>179 (17%)</td>
<td>0 (0%)</td>
<td>9 (1%)</td>
</tr>
<tr>
<td>Rejected/Pending</td>
<td>25%</td>
<td>48%</td>
<td>30%</td>
</tr>
</tbody>
</table>
Flood Text Update
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, lessons learned, and outreach

3. Begin to promote new development + proactive retrofitting to high resiliency standards
Flood Text II
Fix and improve provisions based on lessons learned

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

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

3. **Ground Floors**
   Current incentives to keep active ground floors may not be enough.
Height Improvements and lessons learned

ISSUE

The 2013 Flood Text allowed for zoning envelopes to be adjusted to the height of the flood elevation. Although, it may still prevent certain access solutions in “packed” envelopes, and it may discourage long-term planning:

Without bump-up

Zoning Envelope

With bump-up

Properties owners may want to address future risk by over-elevating
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
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
Height
Improvements and lessons learned

ISSUE
The 2013 Flood Text doesn’t provide a solution for non-raisable building typologies:

Homeowners may face the loss of subgrade/at grade spaces when retrofitting.
Commercial Ground Floors
Improvements and lessons learned

ISSUE

• Bad urban design outcomes due to “squishing” – dark, low-ceilinged establishments.
• Causes lower-grade commercial stock, limits the types of retail tenants and services that can locate in the building, such as restaurants.
• Doesn’t apply to at least half of the floodzone.
• Doesn’t create a zoning incentive to prefer dry floodproofing implementations over wet floodproofing (active over passive).

Example of ‘squished’ retail (1809 Emmons Ave., BK)