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 50 of 59 Community Boards
Buildings: 71,500 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

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

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

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

2015 PFIRMs  46% increase  100% increase  2050 Projected 100 year flood plain

2050 Projected 100 year flood plain

46% increase

41.5% increase

59% increase
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 standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the Design Flood Elevation (DFE).
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
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
###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><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%)</td>
<td></td>
<td>Only 113 (10%)</td>
<td>Only 532 (3%)</td>
</tr>
<tr>
<td>meet full resiliency standards</td>
<td><strong>1,090</strong></td>
<td>meet full resiliency standards</td>
<td>meet full resiliency standards</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>
</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 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 Highly Vulnerable Areas
Density may need to be limited in highly vulnerable areas
Flood Text II
Lesson learned: Cellar and Residential living space lost

EXAMPLE ISSUE

The 2013 Flood Text allowed for adjustment of “zoning envelopes” to facilitate the retrofitting and replacement of living space above the DFE, out of harm’s way, but this flexibility applies unevenly:

**Case study 1:** Replacement of ‘cellar’ story in a high-DFE retrofit

**Case study 2:** Loss of living space in a low-DFE retrofit
Flood Text II
Lesson learned: FAR incentive to retrofit buildings not effective

EXAMPLE ISSUE

The 2013 Flood Text allowed for floodproofed space to be exempted from floor area to incentivize the retrofitting of existing buildings but had the following issues:

• Analysis of DOB permitting indicates this incentive likely has not been used since it was introduced.

• Restrictions accompanying this flexibility (only applies in certain districts, up to 10,000 sq. ft., C space cannot be replaced atop R, prohibition against creating new units, requirement to provide new parking spaces) may be too onerous.

• Only applies to existing buildings – not new buildings.
EXAMPLE ISSUE

The 2013 Flood Text redefined “cellar” to exempt at-grade stories to incentivize the retrofitting of existing buildings but had the following issues:

• 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)
Flood Text II
Lesson learned: Additional height not permitted for future flood projections

EXAMPLE ISSUE
The 2013 Flood Text doesn’t provide zoning relief for accommodating future flood risk

- Zoning relief is “minimum necessary” to elevate only to the DFE – nothing higher.
- Some building owners may want to take sea level rise, future flood heights, or more powerful storms (e.g., Hurricane Sandy) into account when building. No incentives.
- Close coordination is necessary to align zoning with FEMA “Climate Smart” maps.
Lesson learned: Cottage envelope is not permanent

**EXAMPLE ISSUE**

The 2015 SRNR created a new contextual envelope to facilitate the reconstruction of the very small homes on small lots, however these rules were temporary:

- Not available permanently (past 2022)
- Doesn’t apply outside of “Neighborhood Recovery Areas”
- Doesn’t prevent “candlesticks” on currently vacant lots

Currently allowed:
- Minimum 5’ sideyards
- 21’/35’ height
- Fits 0.6 FAR

Proposed Envelope:
- Minimum 3’ sideyards
- 19’/25’ height
- Fits 0.6 FAR
Flood Text II
Lesson learned: Not all existing buildings were grandfathered

**EXAMPLE ISSUE**

To facilitate the recovery of non-conforming and non-complying homes, the 2013 Flood Text gave greater relief to these homes, but 500+ residential buildings in C8/M Districts were left out.

- **Underlying Article V** rules always allow 1+2 family homes to be rebuilt, regardless of level of damage, except R in C8/M
- **FT I** allowed any non-conforming building damaged >50% by Hurricane Sandy to rebuild, except R in C8/M

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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