Flood Resilience
Text Amendment II

Presentation to the AIA Brooklyn
April 19, 2017
Agenda

1. Recap of DCP’s resiliency work program

2. Discussion on Flood Text II
   • Issues of height
   • Issues of floor area
   • Climate change preparedness
   • Bungalow typologies and small lots
   • Nonconforming Uses

3. Open Discussion
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.
Resiliency planning at DCP

**Flood Text** (2013) initial, temporary regulations building off EO 230

**SRNR** (2015) provides additional zoning relief to expedite recovery

**Flood Text II** (2018) to be updated and made permanent

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**Executive Order 230** (2012) mayoral override of zoning

**PFIRM + Freeboard** (2012) DOC requires most restrictive map; additional elevation

**SIRR Report** (2013) long-term, citywide resiliency framework

**Build it Back** (2015) lessons learned in rebuilding effort inform zoning changes

**One New York** (2015) moves from recovery to future resiliency

**Neighborhood Studies** (2014-17) will inform the text and local rezonings
Citywide Resiliency Outreach

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<th>2016</th>
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Identify key stakeholders, including local and citywide organizations and elected officials.

Brief CBs and other groups on resiliency and zoning issues, prepare for more in-depth conversations.

Public presentations and workshops on the zoning issues and options for addressing them.

Public presentations on full draft proposal in advance of formal ULURP process

*Schedule is tentative and subject to change*
NYC's flood risk is high.

The floodplain affects a large geography and most community and council districts.

### 100 Year Floodplain
FEMA 2013 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
100 Year Floodplain
FEMA 2015 PFIRM

Population: 164,800
Projected by 2050s: 331,100

Buildings: 26,900
Projected by 2050s: 51,600

11 of 18 Community Boards
FIRM vs. PFIRM

FIRM
1983; digitized 2007
Currently used for flood insurance purposes

PFIRM
2013, revised 2015
Currently used for building code purposes

Post-appeal PFIRM
Expected 2019+
Affected geography unknown

Not actual map – illustrative only
How are buildings in the floodplain regulated?

Flood Insurance Rate Maps: Determine where floodplain regulations apply.

National Flood Insurance Program: Rates encourage building elevation and other retrofits.


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

Flood resilient construction standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the design flood elevation (DFE).

- Use below DFE is restricted to parking, storage or access
- Site is filled to lowest adjacent grade
- Mechanical systems are elevated above DFE
- Living spaces are elevated above DFE
- WET FLOODPROOF (Water comes in and out)
Flood-resilient construction standards require certain buildings to elevate the lowest floor, as well as mechanical equipment, above the design flood elevation (DFE).
Flood-resistant construction
Required by DOB

Flood resilient construction standards allow commercial buildings to dry floodproof the lowest floor, as well as mechanical equipment, below the design flood elevation (DFE).
How are buildings in the floodplain regulated?

- **Flood Insurance Rate Maps**
  - Determine where floodplain regulations apply

- **National Flood Insurance Program**
  - Rates encourage building elevation and other retrofits

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

- **Zoning Resolution (DCP)**
  - Zoning accommodates these regulations and improves neighborhood character
Flood insurance rates
Set by FEMA

Raising or retrofitting your 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**
  - Annual premium: ~$9,000
- **AT BFE**
  - Annual premium: ~$1,400
- **3 FEET OR MORE ABOVE BFE**
  - Annual premium: ~$450
How are buildings in the floodplain regulated?

- **Flood Insurance Rate Maps**: Determine where floodplain regulations apply.
- **National Flood Insurance Program**: Rates encourage building elevation and other retrofits.
- **Building Code (DOB)**: Code requires new buildings and substantial improvements to meet FEMA standards.
- **Zoning Resolution (DCP)**: Zoning accommodates these regulations and improves neighborhood character.
DCP’s approach to future zoning + land use strategies

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.

**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.

*stakeholder input factored into zoning and land-use strategy throughout*
2013 Citywide Flood Resilience Text Amendment

- **Intended to be updated based on lessons learned. Expires 1 year after adoption of PFIRMs.**

- **Height:** increases the height limit of all buildings in the floodplain by allowing height to be measured from the Design Flood Elevation (DFE), and in some cases, a higher reference point

- **Floor area:** allows discounting of floor space when lost in order to come into compliance with the latest building standards (raised entryways, mechanical space, floodproofed areas)

- **Retrofitting older buildings:** overrides typical zoning rules for non-complying and non-conforming buildings, giving them wide latitude to retrofit and rebuild.

- **Design standards:** requires elevated buildings to mitigate their impact on the streetscape
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 for Neighborhood Recovery

Special rules to accelerate recovery from Hurricane Sandy.

Temporary regulations, expiring in 2020, in limited areas of Brooklyn, Queens, and Staten Island

In Brooklyn: Seagate, Brighton Beach, Sheepshead Bay, Gerritsen Beach, Canarsie
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

Citywide DCP Studies:

Neighborhood Studies:
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

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<th>NB 1,021</th>
<th>Alt-1 1,090</th>
<th>Alt-2 15,573</th>
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<tr>
<td>All 1,021 are Appendix G compliant</td>
<td>149 (14%) approved</td>
<td>36 (31%) approved</td>
<td>245 (46%) approved</td>
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<td>451 (44%) underway</td>
<td>24 (21%) underway</td>
<td>122 (23%) underway</td>
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<td>179 (17%) complete</td>
<td>0 (0%) complete</td>
<td>9 (1%) complete</td>
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<td>25% rejected/pending</td>
<td>48% rejected/pending</td>
<td>30% rejected/pending</td>
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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
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
   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

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 bungalow 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
The 2013 Flood Text allowed for zoning envelopes to be adjusted to the height of the flood elevation.

Where flood elevations-above-grade are moderate, additional height is given to ensure that large spaces beneath buildings can be utilized effectively:

1+2 Family Homes: 3’ (6’ > 9’)  
Commercial Buildings: 7’ (5’ > 12’)  
Multifamily: 5’ (5’ > 10’)

Where flood elevations-above-grade are moderate, additional height is given to ensure that large spaces beneath buildings can be utilized effectively:

1+2 Family Homes: 3’ (6’ > 9’)  
Commercial Buildings: 7’ (5’ > 12’)  
Multifamily: 5’ (5’ > 10’)
The 2013 Flood Text allowed for zoning envelopes to be adjusted to the height of the flood elevation.

**ISSUE**

- Should apply more broadly to single-family homes
- Should apply more extensively to large building due to the unique access issues they face
- Does not address the loss of subgrade space (which is expensive to preserve in the flood zone)
The 2013 Flood Text allowed for zoning envelopes to be adjusted to the height of the flood elevation.

**ISSUE**

- Prevents certain access solutions in “packed” envelopes
The 2013 Flood Text also allowed existing 1+2 family homes to be physically raised to the DFE.

- Even if these buildings were non-compliant, they were permitted to be raised regardless of height, yard, floor area, and other regulations.
The 2013 Flood Text also allowed existing 1+2 family homes to be physically raised to the DFE.

**ISSUE**

- Doesn’t apply to *other building types* (3 family homes, larger multi-family buildings, non-residential buildings)

- Doesn’t allow the **bump-up to apply** (the provisions are mutually exclusive)

- Doesn’t allow elevation to any higher level (i.e., BFE+3)

- Doesn’t provide a solution for **non-raisable building typologies**. (more on next slide)
The 2013 Flood Text also allowed existing 1+2 family homes to be physically raised to the DFE.

**ISSUE**

- Doesn’t provide a solution for non-raisable building typologies.
The 2013 Flood Text exempted resilient entryways from floor area

- Intended to ensure that compliance with new Appendix G requirements wouldn’t constitute a penalty against development rights.
To incentivize the retrofitting of existing buildings, the 2013 Flood Text allowed any floodproofed space to be exempted from floor area

- This space could be relocated to a new addition atop the building, (provided there is sufficient room), helping to finance a retrofit project.
To incentivize the retrofitting of existing buildings, the 2013 Flood Text allowed any floodproofed space to be exempted from floor area.

**ISSUE**

- 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.
To incentivize the dry floodproofing of at-grade spaces the 2013 Flood Text redefined “cellar” to exempt at-grade stories in certain cases.

- Allowed up to an additional 1 FAR in areas where the flood elevation above grade is more than half of the floor-to-ceiling height.

Typical cellar space  
(Exempt from floor area)

Above-grade cellar space  
(In flood zones where DFE > 4.6')
To incentivize the dry-floodproofing of at-grade spaces the 2013 Flood Text redefined “cellar” to exempt at-grade stories in certain cases.

**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
To incentivize the floodproofing of at-grade spaces the 2013 Flood Text redefined “cellar” to exempt at-grade stories in certain cases.

ISSUE

- Ongoing uncertainty regarding acceptable dry floodproofing methods:

  - Non-NFIP compliant (e.g. “Aquafence”; allowed for Pre-FIRM buildings)
  - Deployable floodgate (currently allowed only at doors and operable windows)
  - Integrated floodproofing (‘aquarium-grade’ glass for glazing or curtain-wall systems)
To incentivize the floodproofing of at-grade spaces the 2013 Flood Text redefined “cellar” to exempt at-grade stories in certain cases.

ISSUE

- Ongoing uncertainty regarding acceptable dry floodproofing methods:
  - Deployable floodgate
    (currently allowed only at doors and operable windows)
  - Deployable floodgate
    (allowed at perimeter only for pre-FIRM buildings)
Grandfathering

To facilitate the recovery of non-conforming and non-complying homes, the 2013 Flood Text gave greater relief to these homes:

- Non-conforming uses were allowed to remain even if they surpassed the damage and destruction thresholds, and given more time to do so:

  **Previous Rules**
  - Hurricane Sandy
  - House demolished
  - Pre-existing house
  - 2 years
  - Foundations complete

  **New Rules**
  - Hurricane Sandy
  - House demolished
  - Pre-existing house
  - 10 years after new FIRMs
  - New FIRMs adopted (~2018?)
  - Foundations complete (~2028)
To facilitate the recovery of non-conforming and non-complying homes, the 2013 Flood Text gave greater relief to these homes.

**ISSUE**

- **Over 500 residential buildings left out of 2013 relief:**
  1. 300 1+2 Family Homes
  2. 200 Multifamily Buildings

- **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**
To facilitate the reconstruction of the very small homes on small lots, the 2015 SRNR created a new contextual envelope.

- Shorter, but has a more rational layout

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

Proposed Envelope
- Minimum 3’ sideyards
- 19’/25’ height
- Fits 0.6 FAR
To facilitate the reconstruction of the very small homes on small lots, the 2015 SRNR created a new contextual envelope.

**ISSUE**

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

- Maximum NFIP premium reduction reached when house is BFE+2.5’
The current flood text doesn’t provide zoning relief to the future floodplain

- Today’s 500YR floodplain is roughly equivalent to 2050 100YR, and includes Sandy inundation area.
- Construction in this future floodplain has no special requirements or incentives.
- Close coordination is necessary to align zoning with FEMA “Climate Smart” maps.
Citywide Resiliency Outreach

Identify key stakeholders, including local and citywide organizations and elected officials.

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Thank you!

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

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