

Flood Resilience Zoning Text Update

Manhattan Community Board 1

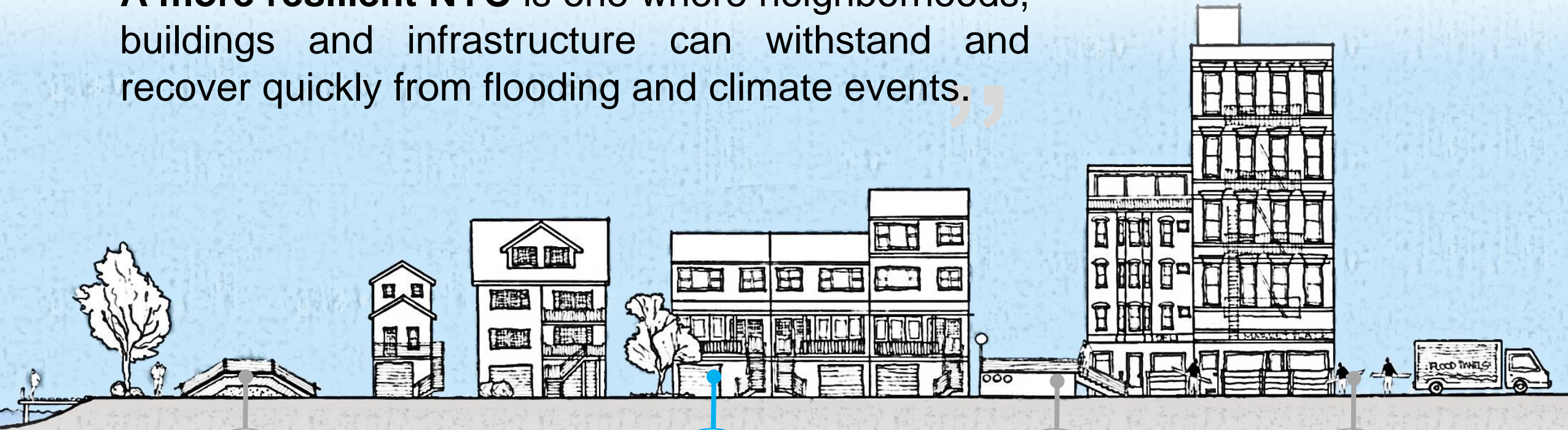
Land Use Committee

June 7, 2017



#ONENYC

“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

FEMA Flood Map

Citywide Flood Risk

NYC's flood risk is high.

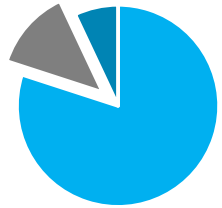
The floodplain affects a large geography and most community and council districts.

100 Year Floodplain

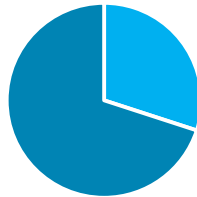
FEMA 2015 PFIRM

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

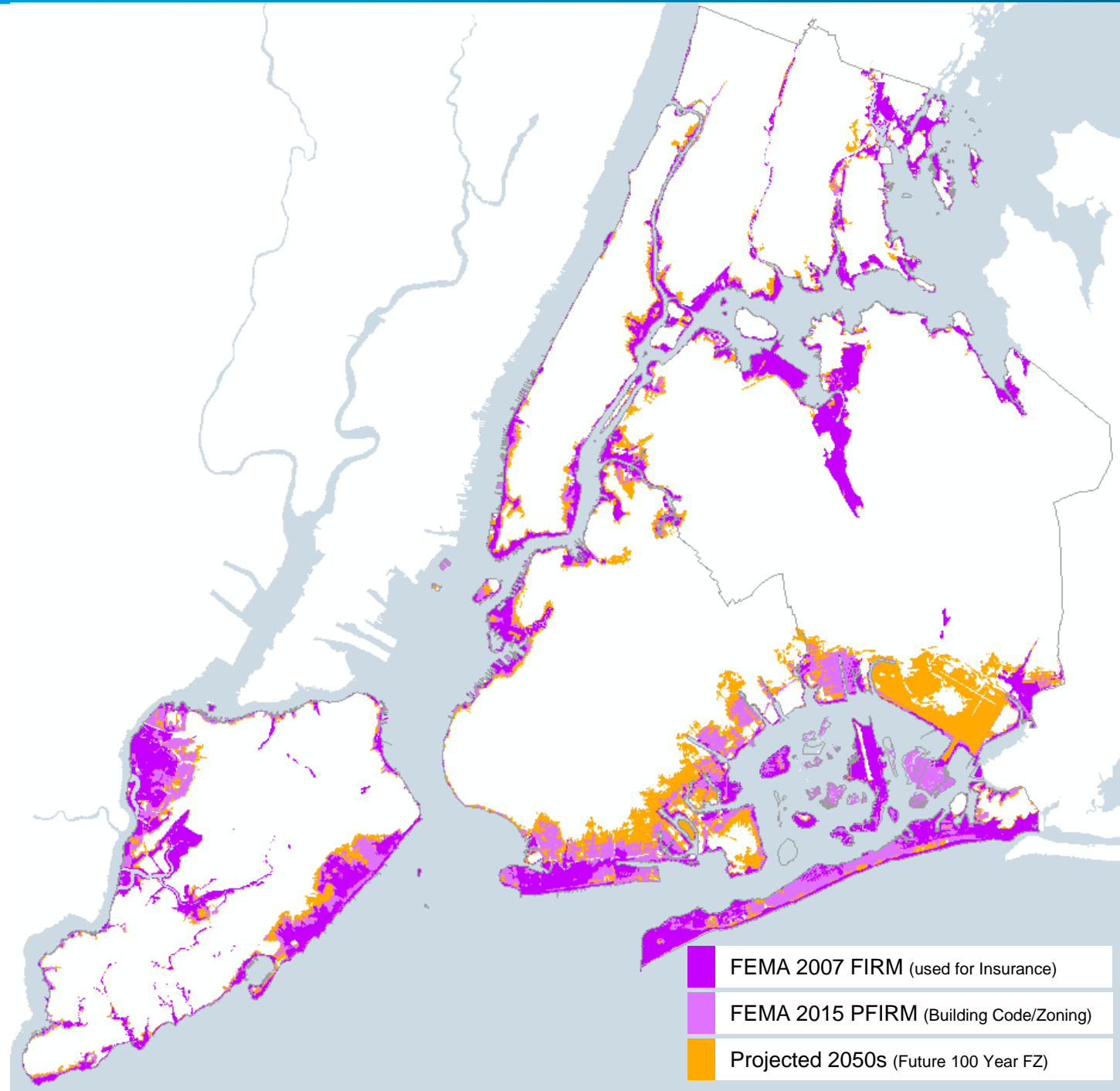
50 of 59 Community Boards
45 of 51 Council Districts



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



Residential
Units:
30% 1-4 units
70% 5+ units



FEMA 2007 FIRM (used for Insurance)

FEMA 2015 PFIRM (Building Code/Zoning)

Projected 2050s (Future 100 Year FZ)

Future Flood Map

Flood Risk in Manhattan

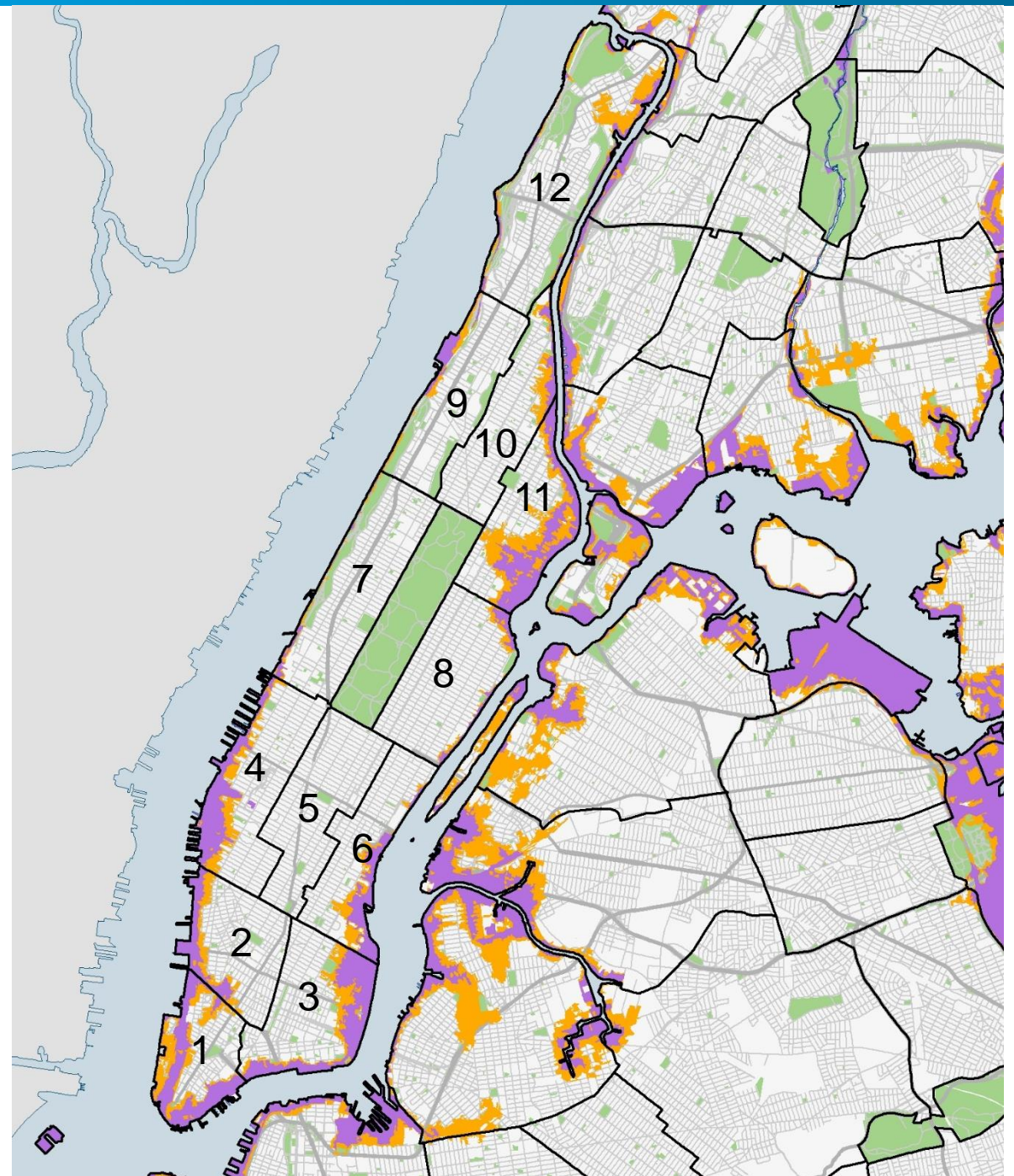
2015 PFIRMs	2050s Projected
89,100	214,500
3,100	5,900

Population in
Floodplain

↑
140%

Buildings in
Floodplain

↑
90%



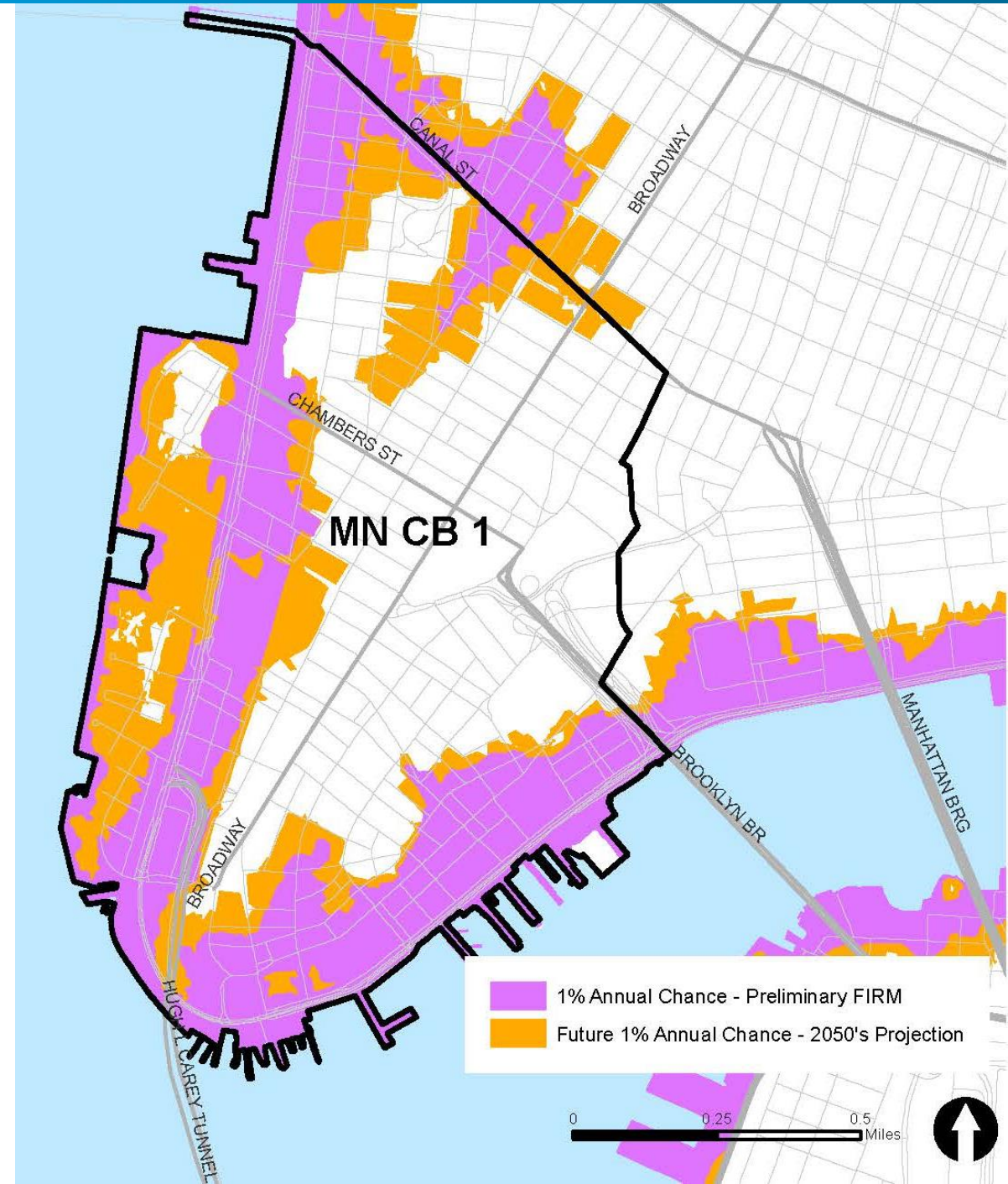
Future Flood Map

Flood Risk in MN CB 1

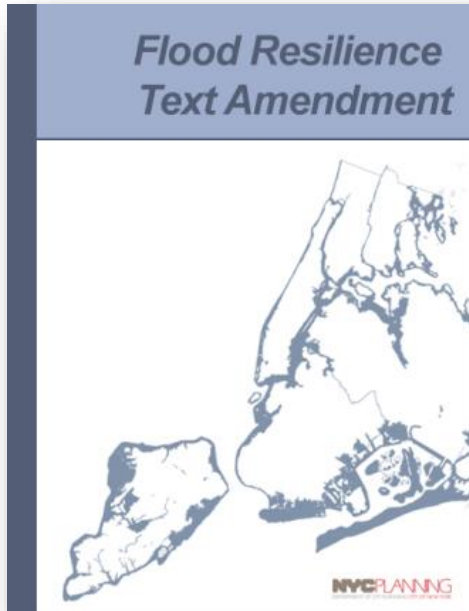
	2015 PFIRMS	2050's Projected
R units in floodplain	39,230	60,050
Buildings in floodplain	1,750	2,790
% buildings in MN CB 1	35%	56%

↑
53%

↑
60%



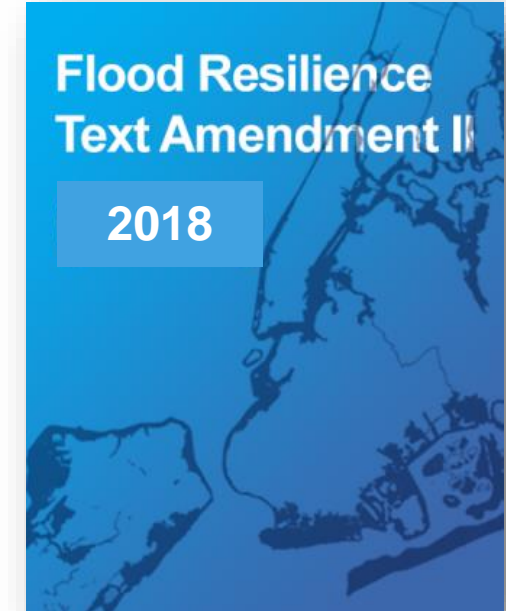
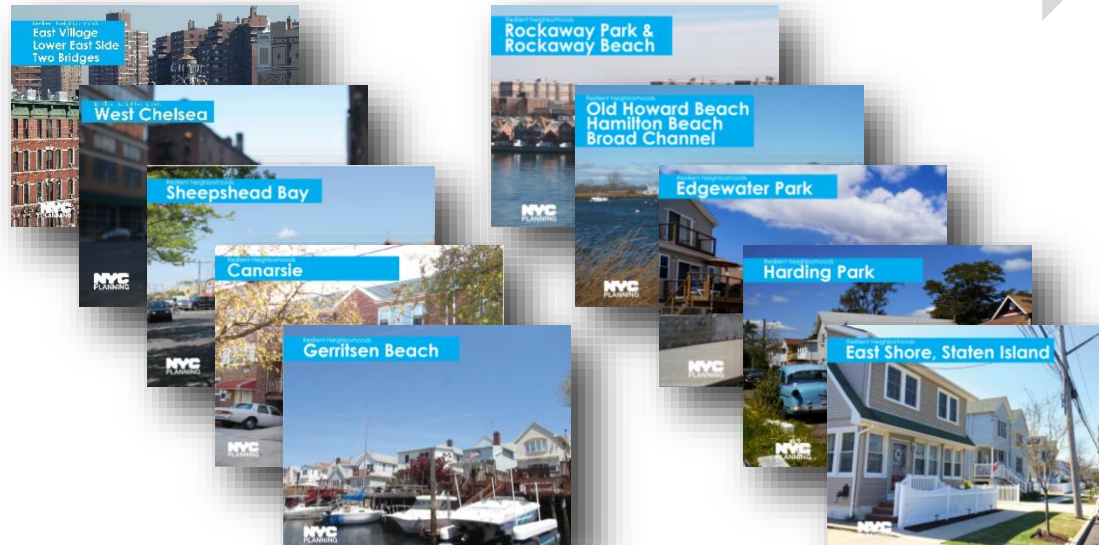
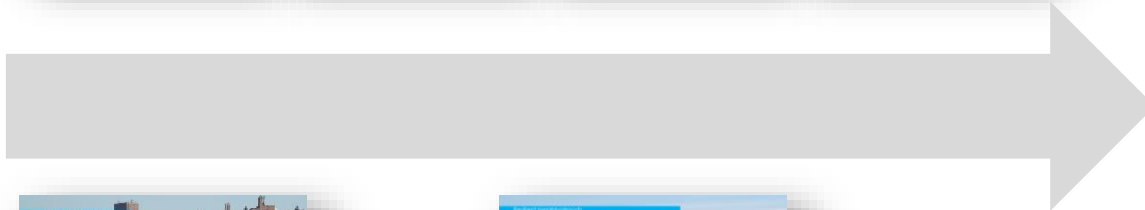
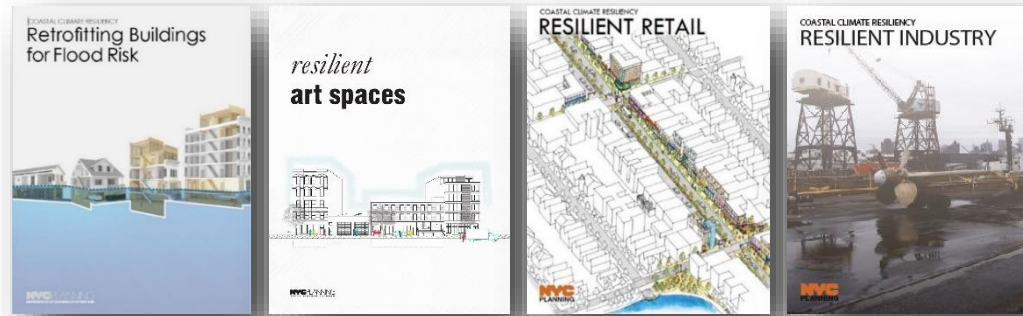
Flood Resilience Zoning Projects at DCP



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?

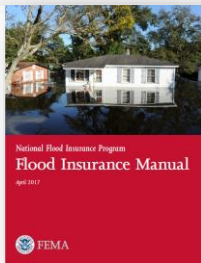


FEMA



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)

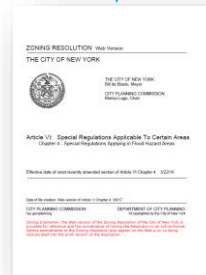
Design minimum construction requirements for flood hazard areas

NYC



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

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)

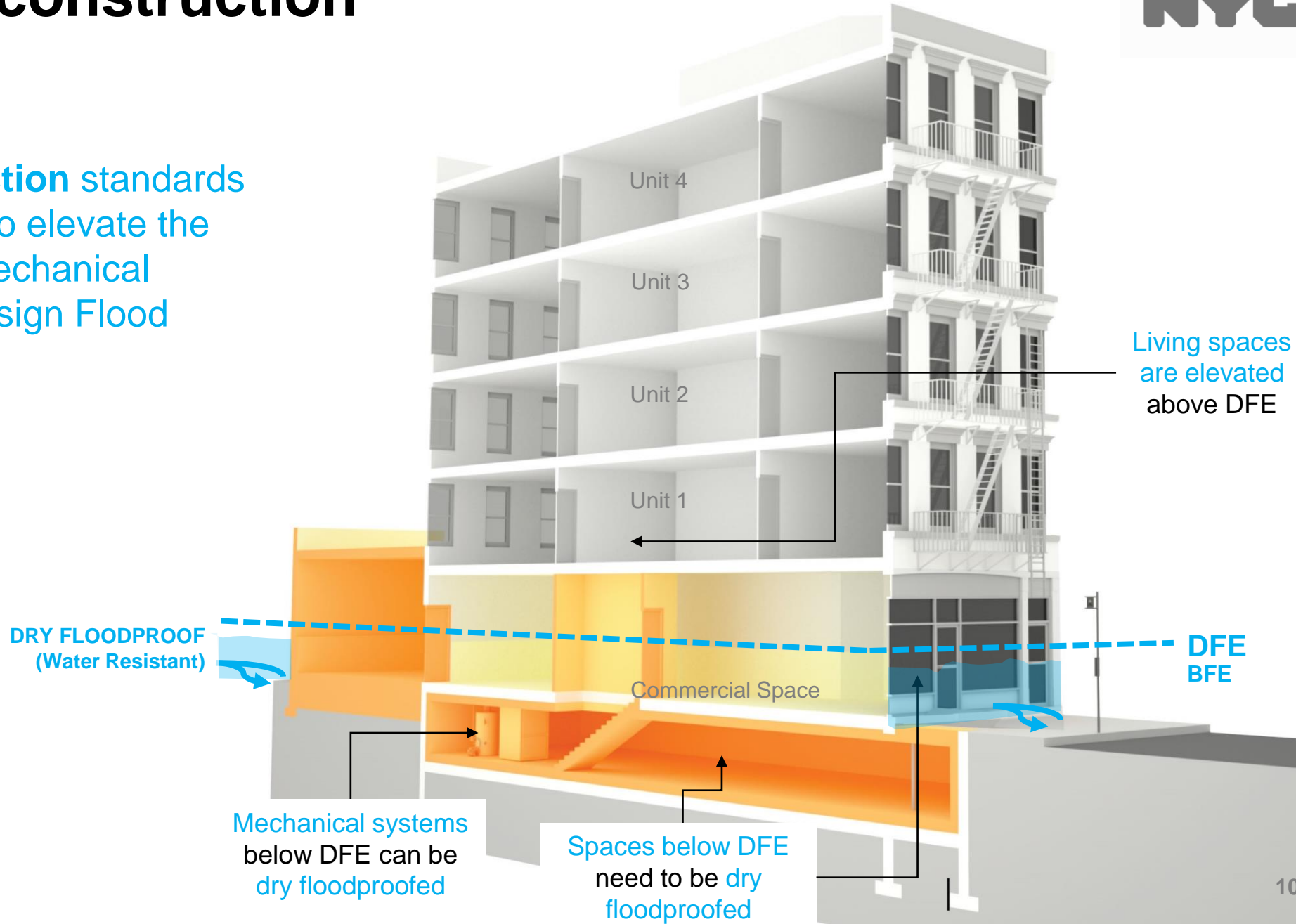


Residential Building
Elevated to DFE – 3' above grade

Flood resilient construction

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).

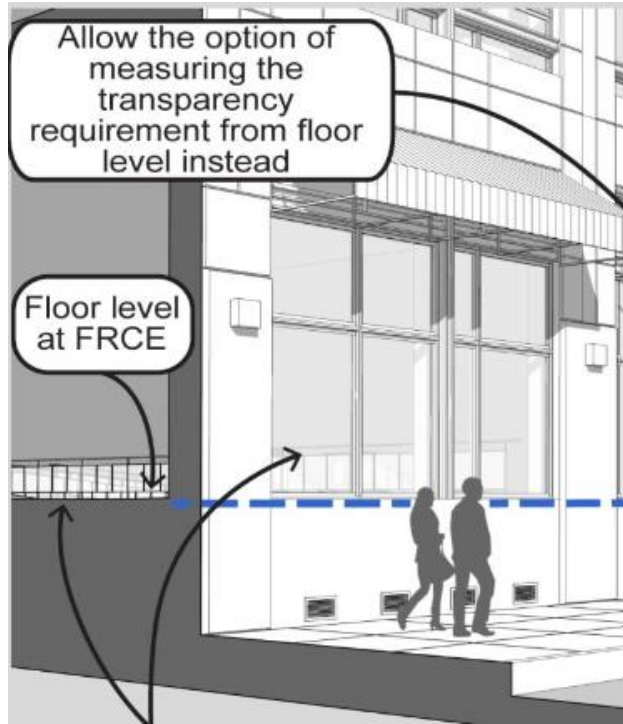


Flood resilient construction

Examples of floodproofing solutions

When the DFE >10', or when the bump-up has been used, any new or enlarged building must provide streetscape mitigations. For residential buildings, this involves a glazed, at-grade lobby. For **mixed-use or commercial buildings**, we require:

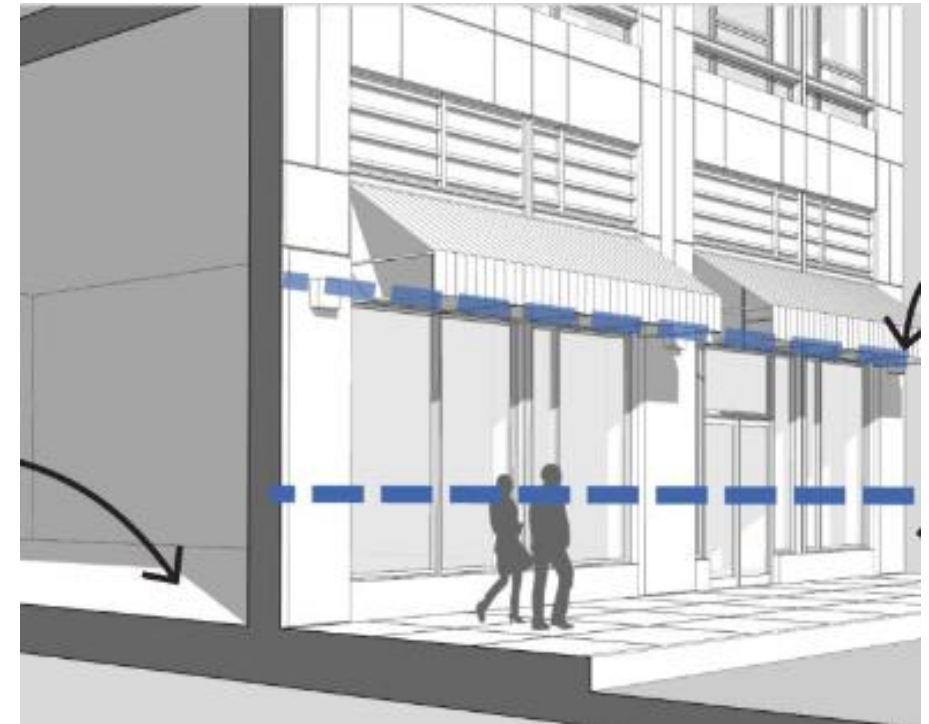
Elevation



Wet floodproofing



Dry floodproofing



For **mixed-use buildings in commercial districts**:
 ZR 64-64 requires 50% transparency between 2'-12' above *curb level*.

Flood resilient construction

Examples of Commercial Buildings



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

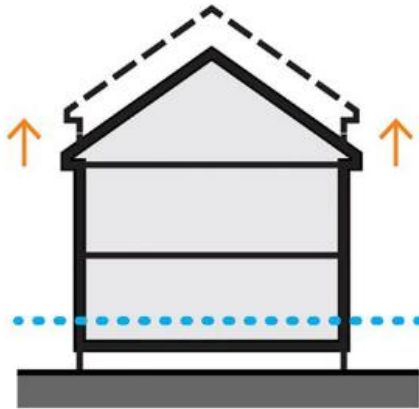


Commercial Ground Floor
Elevated to DFE – 2.5'

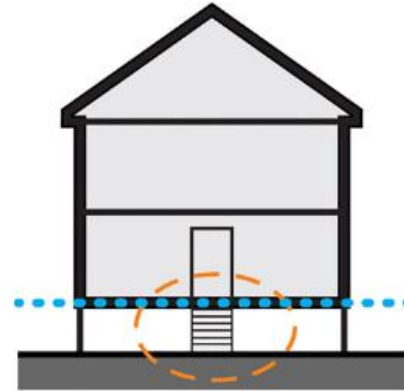
2013 Citywide Flood Text

Amended zoning in six key areas

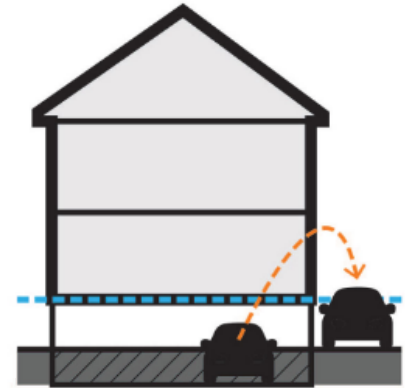
1
Height
Measured from
flood elevation



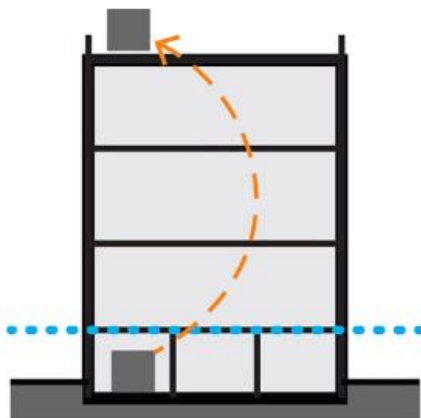
2
Access
Flexibility for
stairs, ramps, lifts



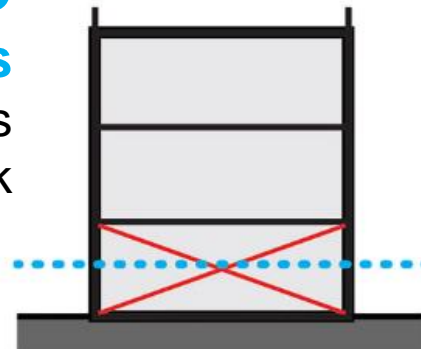
3
Parking
Flexibility to
relocate parking



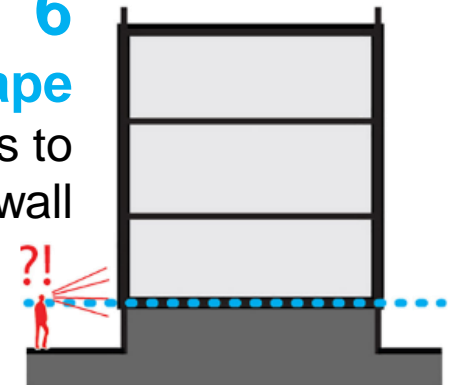
4
Systems
Flexibility to
relocate/elevate



5
Ground Floors
Account for costs
of new flood risk



6
Streetscape
Require features to
mitigate blank wall



Lessons learned since 2013

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



Based on these filings, only **1,600 (2%)** of the **71,000** buildings in the floodplain will be fully flood resilient.

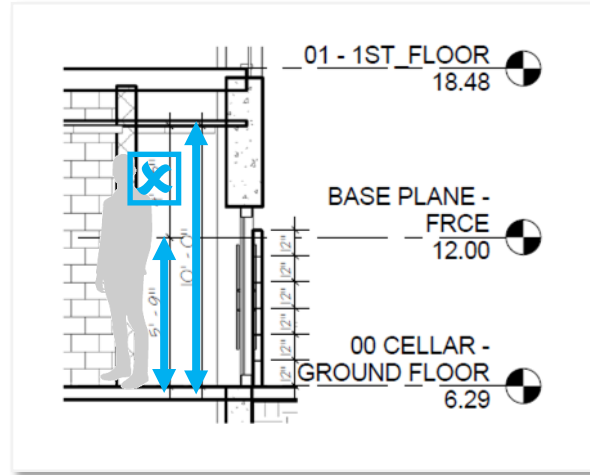
Flood Text Update

Need for a new citywide text amendment



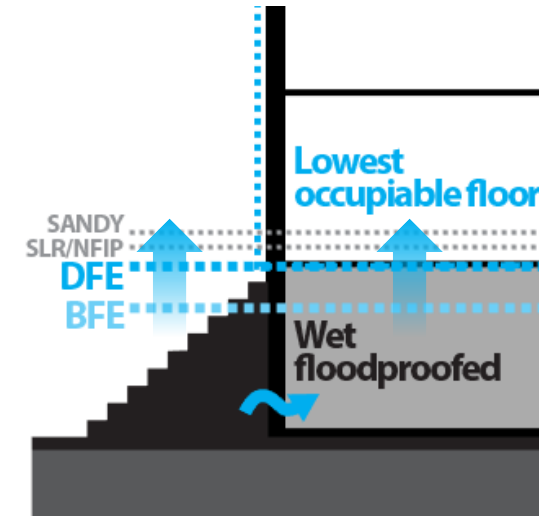
1

Make the provisions of the current, temporary 2013 Flood Text **permanent**



2

Fix and improve provisions based on studies, lessons learned, and outreach

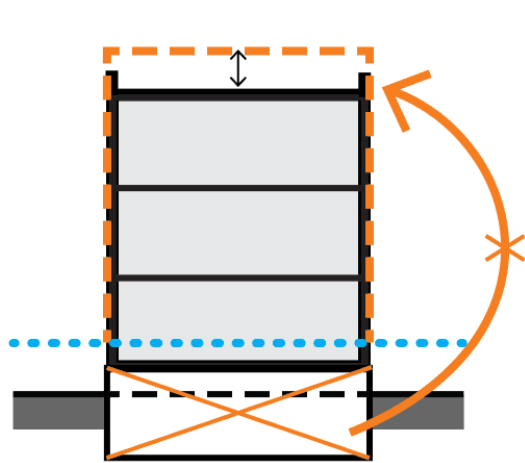


3

Begin to **promote** new development + proactive retrofitting to high resiliency standards

Flood Text II

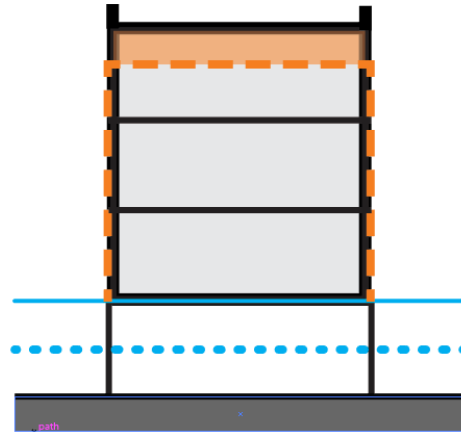
Fix and improve provisions based on lessons learned



1

Height

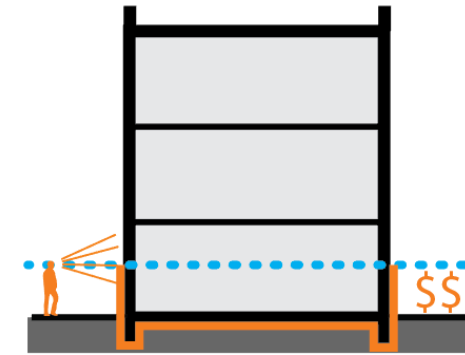
Study how to enable property owners to relocate lost subgrade spaces to upper levels



2

Height

Study how to enable property owners to build to higher resiliency standards



3

Ground Floors

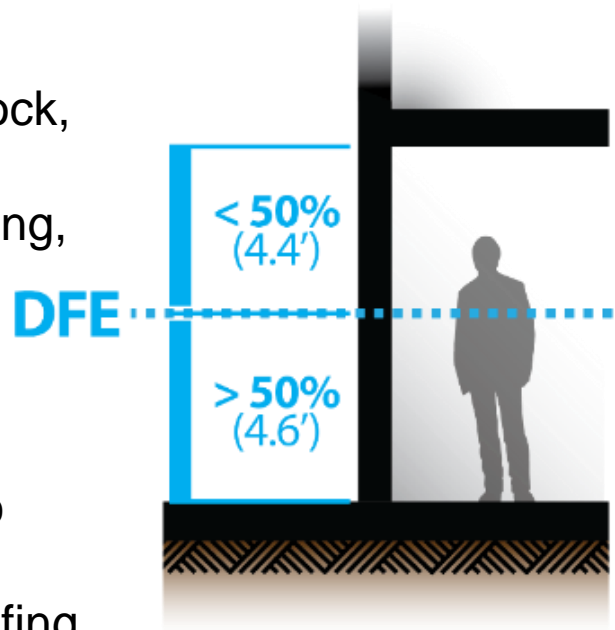
Study how to encourage active, visible ground floor uses

Commercial Ground Floors

Improvements and lessons learned

ISSUE

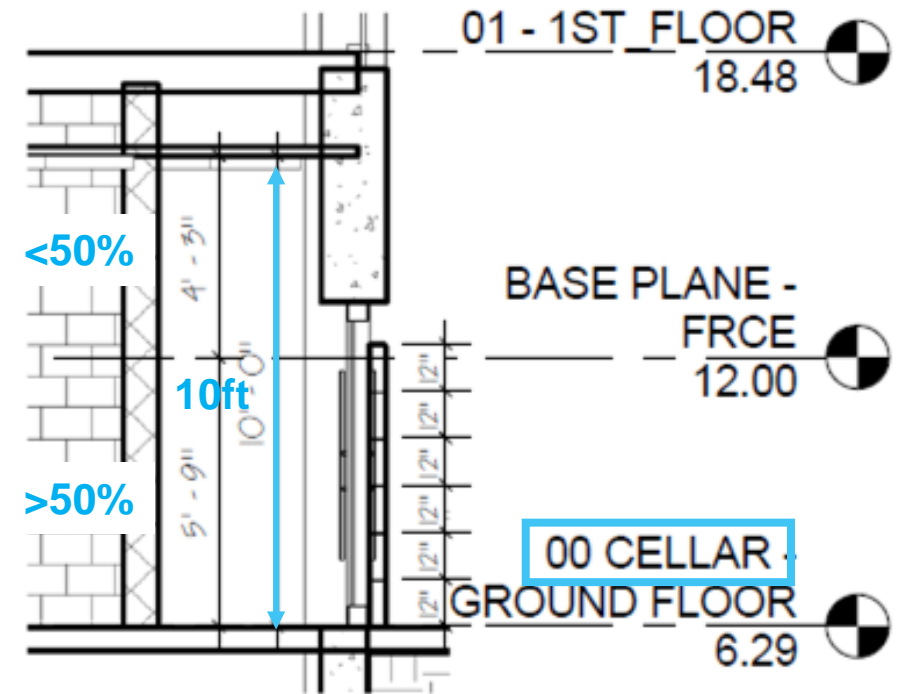
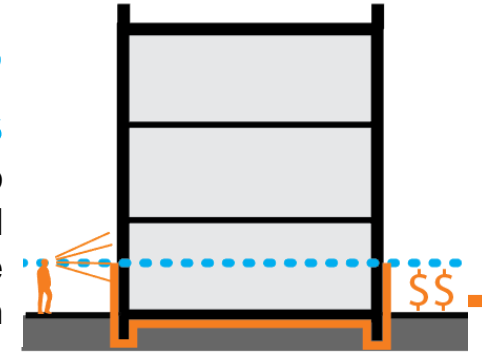
- Bad urban design outcomes due to “squishing” – dark, low-ceilinged establishments.
- Causes lower-grade commercial stock, limits the types of retail tenants and services that can locate in the building, such as restaurants.
- Doesn't apply to at least half of the floodzone.
- Doesn't create a zoning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



Above-grade cellar in the flood zone

3 Ground Floors

Current incentives to keep active ground floors may not be enough



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

Flood Text Update Outreach

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



NYC PLANNING Info Brief Flood Insurance

Flood insurance covers damages to property or personal contents from flooding caused by excessive rainfall, tidal flooding, or wind-driven storm surges. Changes to flood maps and reforms to the National Flood Insurance Program will lead to increases in flood insurance rates over time. In addition to flood resilient construction, insurance is another strategy for reducing flood risk.

Why is Flood Insurance Important?

- Floods can cause significant damage to your most valuable asset: your business.
- Even properties far from the coast are at risk of flooding.
- Homeowner and property insurance do not cover damage by flooding. You need a separate policy.
- Federal assistance is not guaranteed in the event of a flood.
- Many property owners are required by federal law to purchase and maintain flood insurance if the property is located in a high-risk flood zone of the 2007 FIRM (see map to the right), has a federally backed mortgage, or has received federal disaster assistance.

How Much Flood Insurance Must a Homeowner Purchase?

Properties with a federally backed mortgage in a high-risk flood zone and those that have received federal disaster assistance are required to maintain flood insurance up to the National Flood Insurance Program (NFIP) limits, or the outstanding mortgage balance, whichever is lower. Failure to do so may result in mortgage servicers purchasing a policy for the property—possibly at a higher price—on the cost through monthly mortgage payments.

Homeowners without a federally backed mortgage or outside a high-risk flood zone are not required to carry up to the maximum policy limit with additional contents coverage up to \$100,000 for owners or renters. Co-ops, multifamily buildings and business properties are covered up to \$500,000. Business and tenants can also purchase up to \$500,000 in contents coverage.

NYC Planning | November 2016

NYC PLANNING Info Brief Flood Risk in NYC

New York City is highly vulnerable to flooding from coastal storms due to its intensively used waterfront and its extensive coastal geography. Floods have the potential to destroy homes and businesses, impair infrastructure, and threaten human safety. With climate change and sea level rise, these risks are expected to increase in the future, but will most adversely affect low-lying neighborhoods.

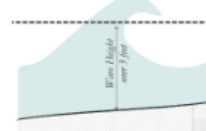
Flood Risks

Hurricanes, tropical storms, nor'easters, intense rain storms, and even extreme tides are the primary causes of flooding in NYC.

For building code, zoning, and planning purposes, flood risk in NYC is represented on FEMA's 2015 Preliminary Flood Risk Rate Maps (PFIRMs).

- PFIRMs show the extent to which floodwaters are expected to rise during a storm event that has a 1% annual chance of occurring. This height is denoted as Flood Elevation (BFE) on the maps.
- The 1% annual chance floodplain, sometimes referred to as the 100-year floodplain. However, this term is used since these floods can occur multiple times within 100 years. In the 1% annual chance floodplain, there is a 26% chance over the life of a 30-year mortgage that a flood will occur.

For flood insurance purposes, the 1% annual chance floodplain with a federally backed mortgage are mandated by law to purchase flood insurance.



The 1% annual chance floodplain is divided into different degrees of flood risk: V and Coastal Flood Risk. The V Zone is the area which has a lower annual chance of flooding.

NYC Planning | November 2016

NYC PLANNING Flood Resilience Zoning

City Planning is working with communities throughout the floodplain to identify zoning and land use strategies to reduce flood risks and support the city's vitality and resiliency through long-term adaptive planning. The Flood Resilience Zoning Text is one part of a wide range of efforts by the City to recover from Hurricane Sandy, promote rebuilding, and increase the city's resilience to climate-related events.

NYC PLANNING Info Brief Flood Resilient Construction

Flood resilient construction reduces potential damages from flooding and can lower flood insurance premiums. New buildings in the floodplain are required to meet flood resilient standards. Existing buildings can reduce their risk by retrofitting or rebuilding to meet these standards, or can take partial, short-term measures to address safety concerns.

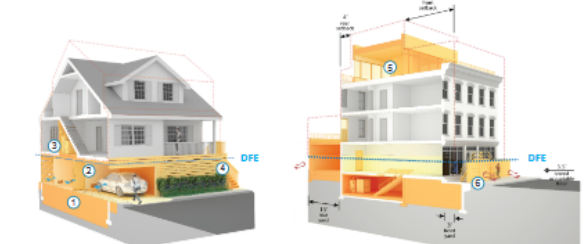
Overview

There is a wide range of accepted flood resilient construction practices for buildings to better withstand floods and recoupy more quickly following a storm. These include:

- Elevating the lowest floor.
- Elevating mechanical equipment such as electrical, heating, and plumbing equipment.
- Wet floodproofing by utilizing water resistant building materials and limiting uses below the Design Flood Elevation (DFE) to parking, building access, and minor storage. This allows water to move in and out of uninhabited, lower portions of the building with minimal damage.
- Dry floodproofing sealing the building's exterior to flood waters and using removable barriers at all entrances below the expected level of flooding in mixed-use and non-residential buildings.

Examples of Flood Resilient Construction

Visit www.nyc.gov/resilientneighborhoods to see more examples in the *Retrofitting for Flood Risk* report.



- Site is filled to the lowest adjacent grade.
- Space below the DFE is for parking, building access or minor storage.
- Mechanical systems are above the DFE.
- Plants and stair turns improve the look of the building from the street.
- Rooftop addition replaces lost below grade space.
- Commercial space is dry floodproofed with removable barriers.

NYC Planning | March 2017 | Flood Resilient Construction

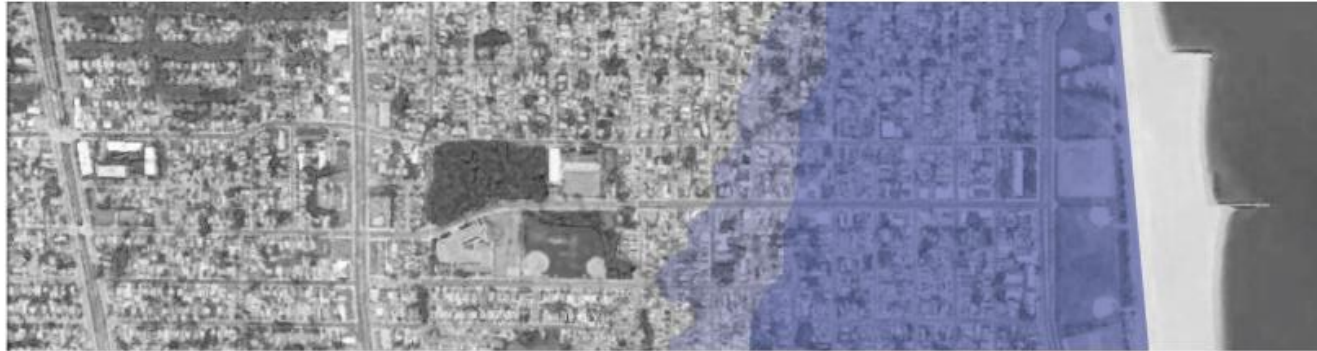


Thank you!

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

Appendix

FIRM vs. PFIRM



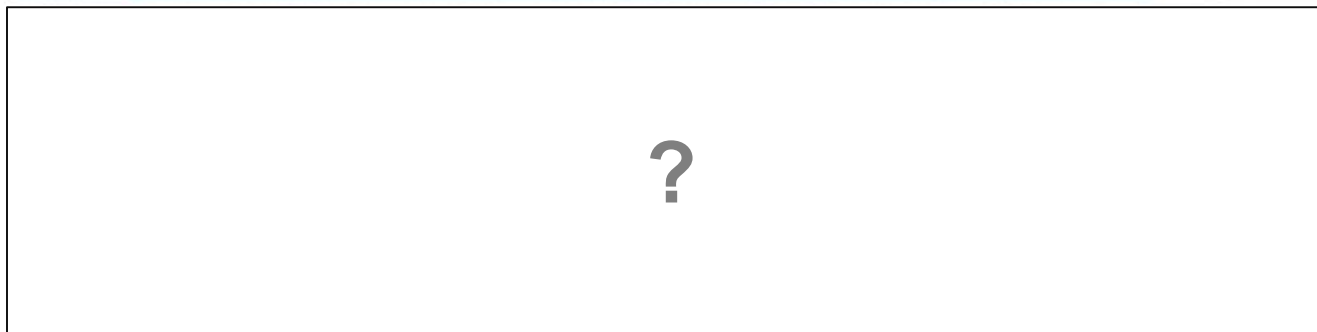
FIRM

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

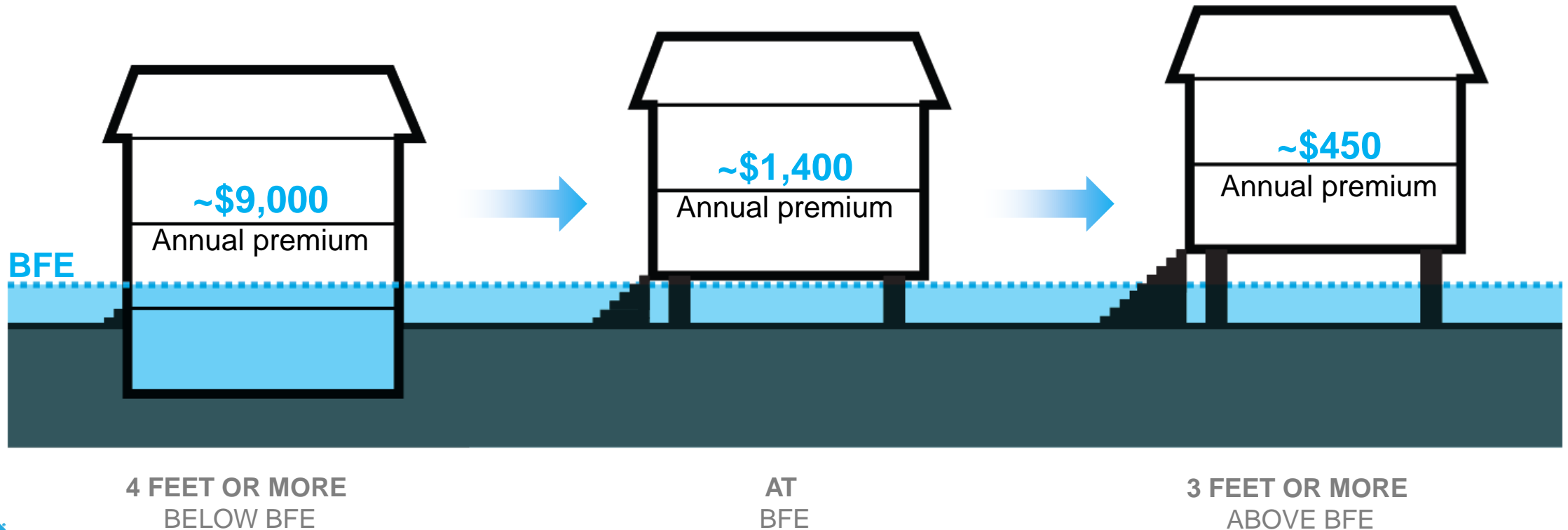
Flood insurance rates

Set by FEMA



Raising or retrofitting your building or home will reduce costs

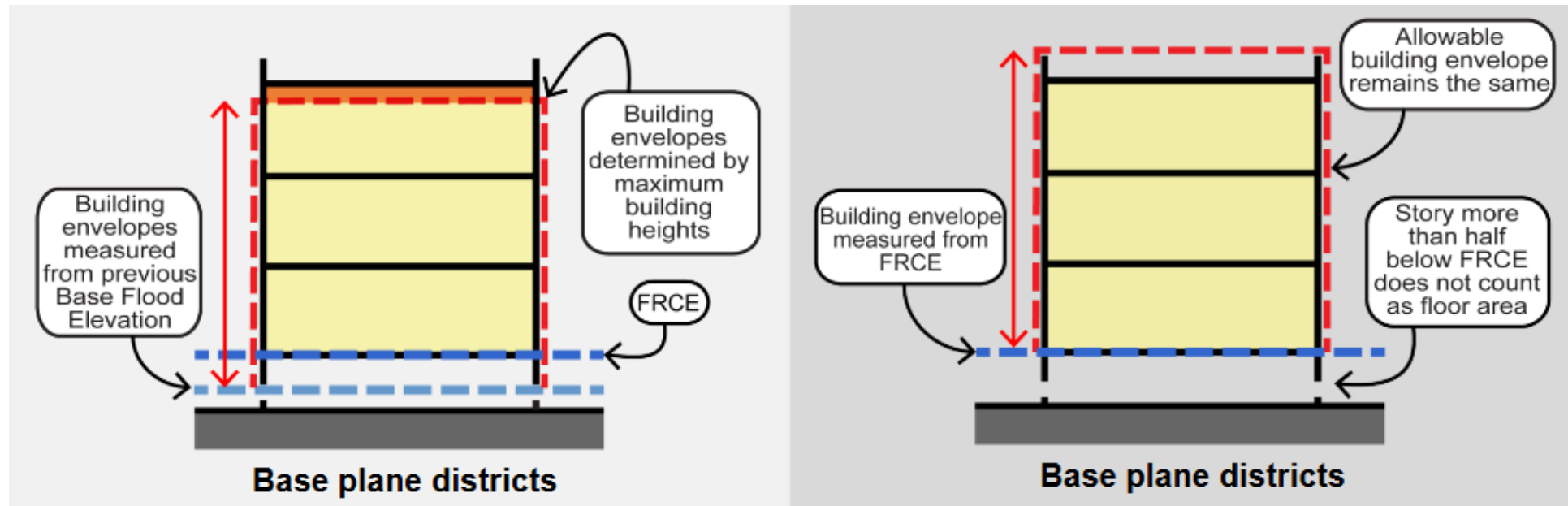
FEMA's flood insurance premiums are lowest when the lowest inhabited floor (any area not used solely for storage, access or parking) is elevated above the **Base Flood Elevation (BFE)**.



2013 Citywide Flood Text

The reference for height was changed from grade to the flood level

This change in how zoning envelopes are measured was intended to ensure that a new building in the flood zone need not be significantly smaller than the same building (in the same zoning district) outside of the flood zone. While the average flood elevation above grade is 3' to 5', in some areas this change allowed 13' of extra height.



2013 Citywide Flood Text

Bump-up: where DFE is moderate, additional height was given

To ensure the utility of spaces subject to flooding, further height (“the bump-up”) is available

Residential buildings:

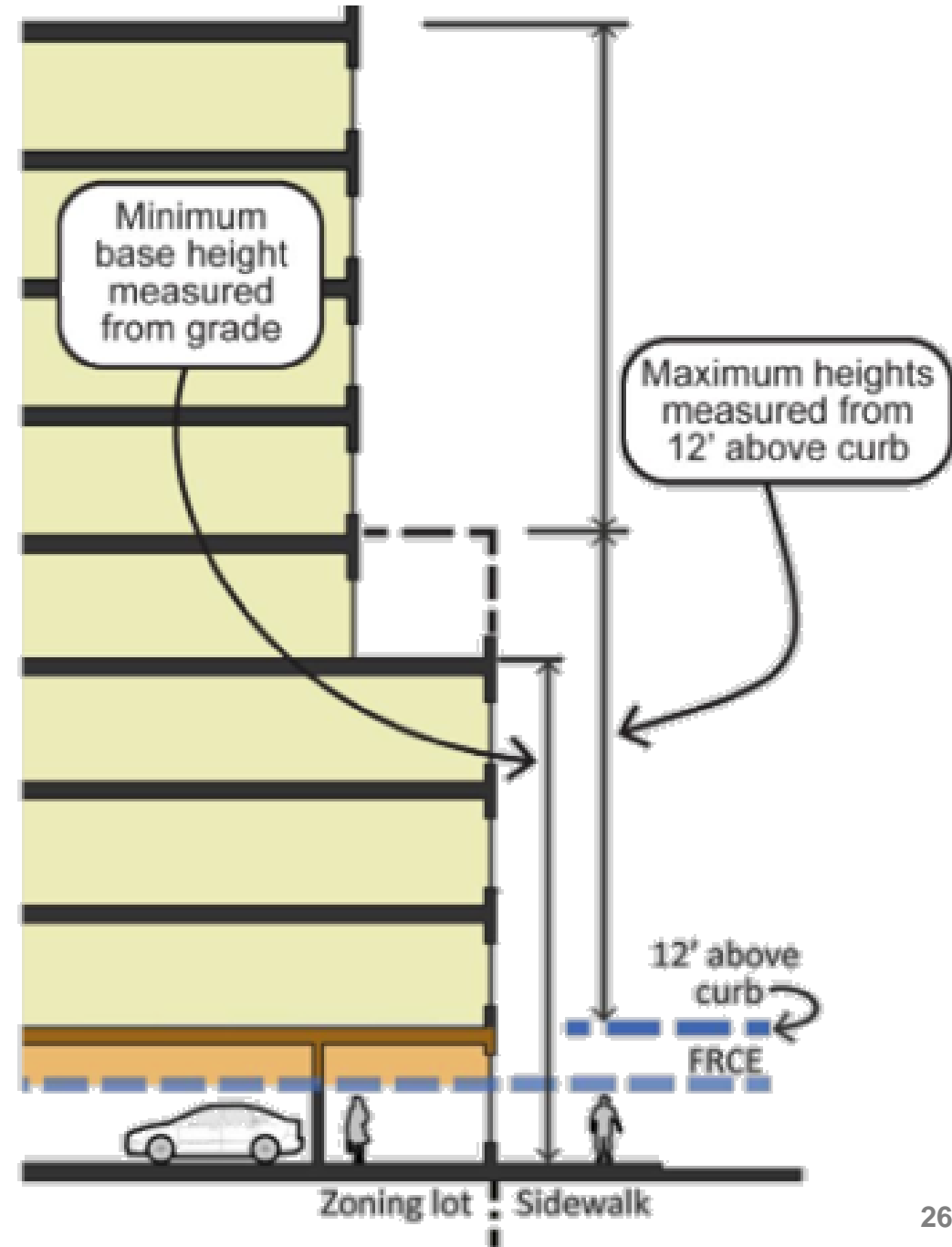
Where the DFE is between **5’-10’** above grade, you can “bump-up” all heights to **10’**

Commercial / mixed buildings:

Where the DFE is between **5’-12’** above grade, you can “bump-up” all heights to **12’**

(depicted at right)

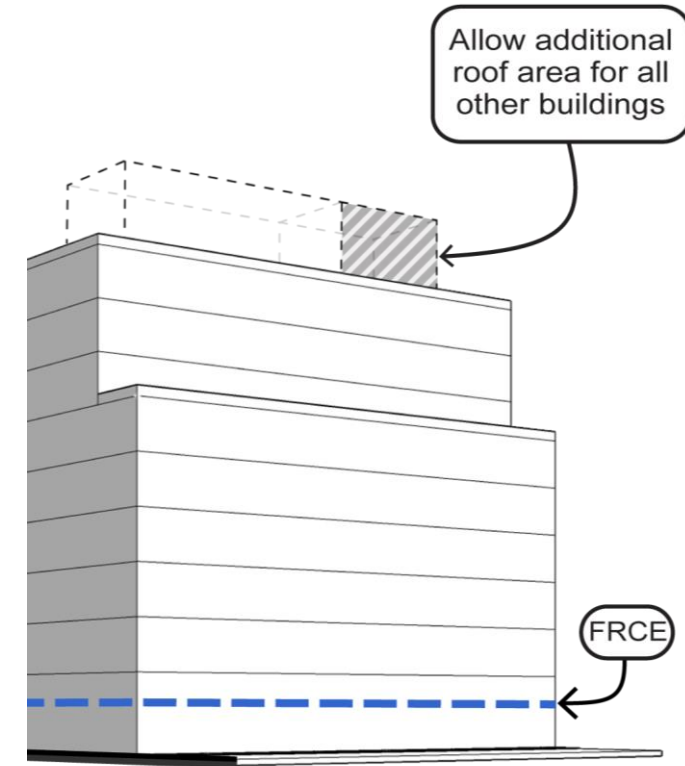
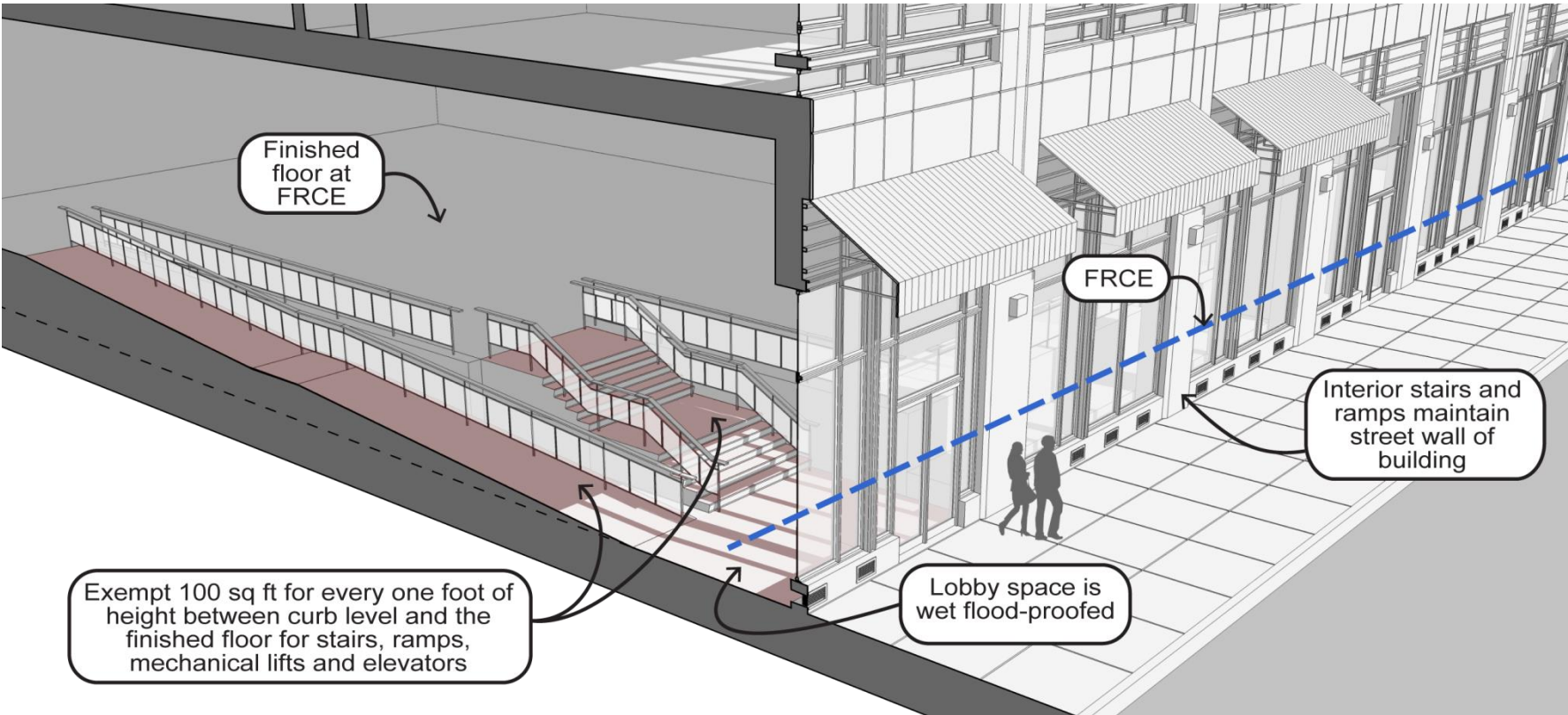
This extra height is designed to promote a **full, floodproofed, at-grade** story – as opposed to an elevated story at the DFE.



2013 Citywide Flood Text

Penalties for complying with new code requirements were lifted

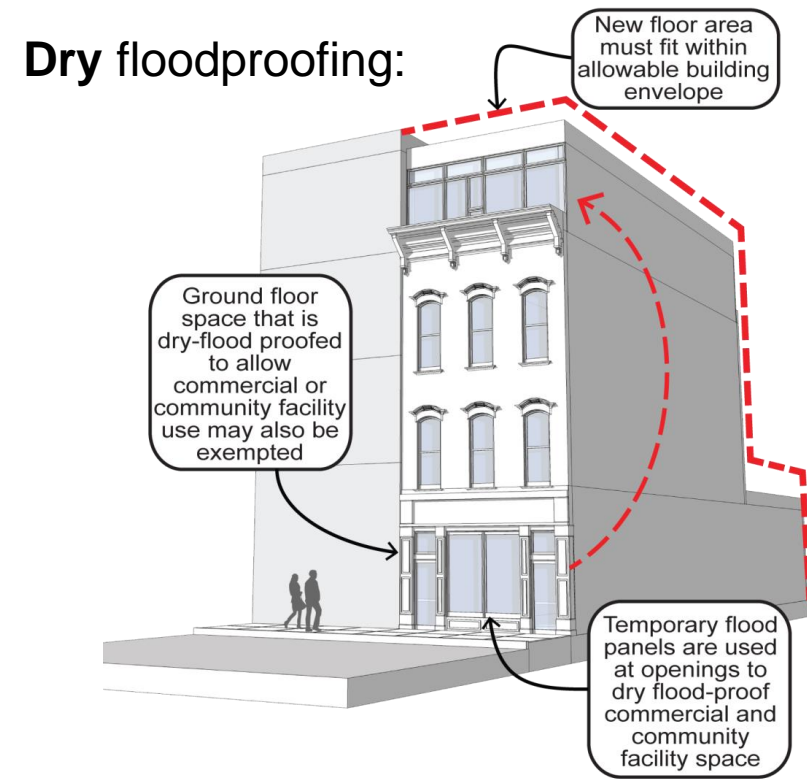
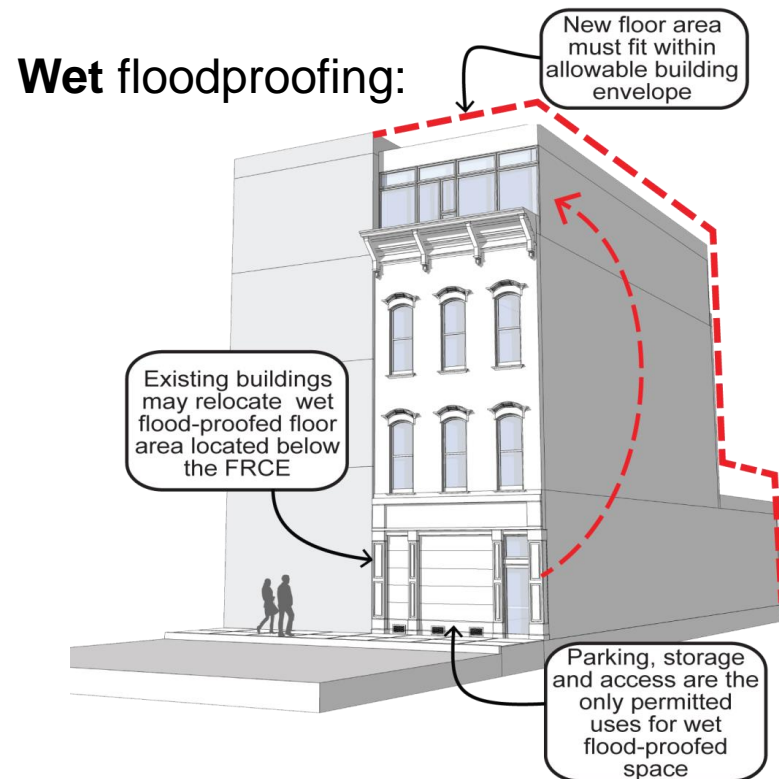
New buildings have a number of new design challenges that existing, grandfathered buildings did not face – these include having to provide ample access to elevated levels (stairs, ramps, and lifts) and locating vital mechanical equipment somewhere other than a cellar. To ensure these did not create a ‘zoning penalty’ these components were exempted from floor area.



2013 Citywide Flood Text

To incentivize the costly retrofitting and floodproofing of old buildings, a floor area incentive was provided.

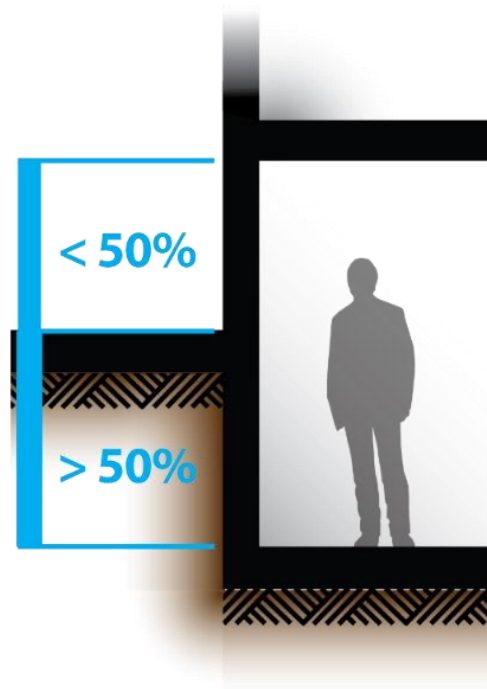
A building owner could floodproof their bottom story, and then add an additional story (or equivalent amount of space) elsewhere in their building, helping to finance a retrofit.



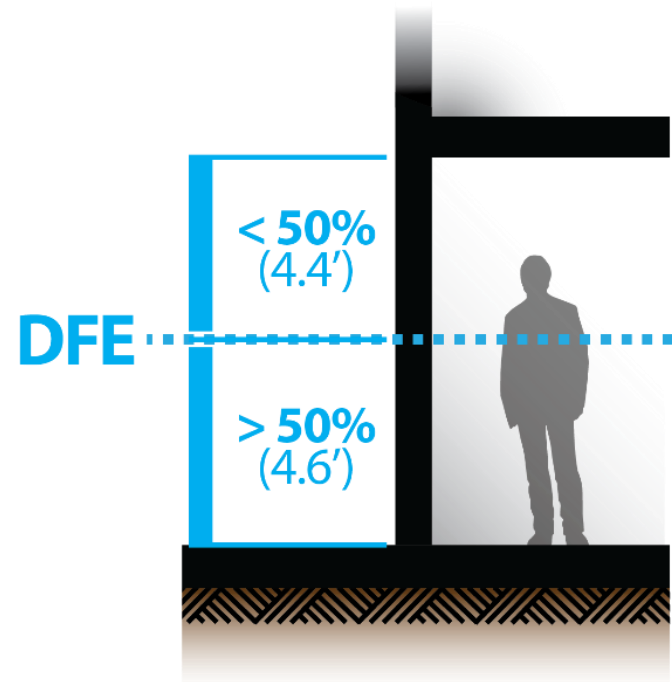
2013 Citywide Flood Text

To offset the cost of floodproofing, a floor area incentive was offered

In some areas, where the flood elevation is moderate-to-high above grade, the entire ground floor can be exempt from floor area, without limitation, if it is wet or dry floodproofed, by virtue of a changed definition of a “cellar”. (Cellars are generally exempt from floor area)



Typical cellar space
(Exempt from floor area)

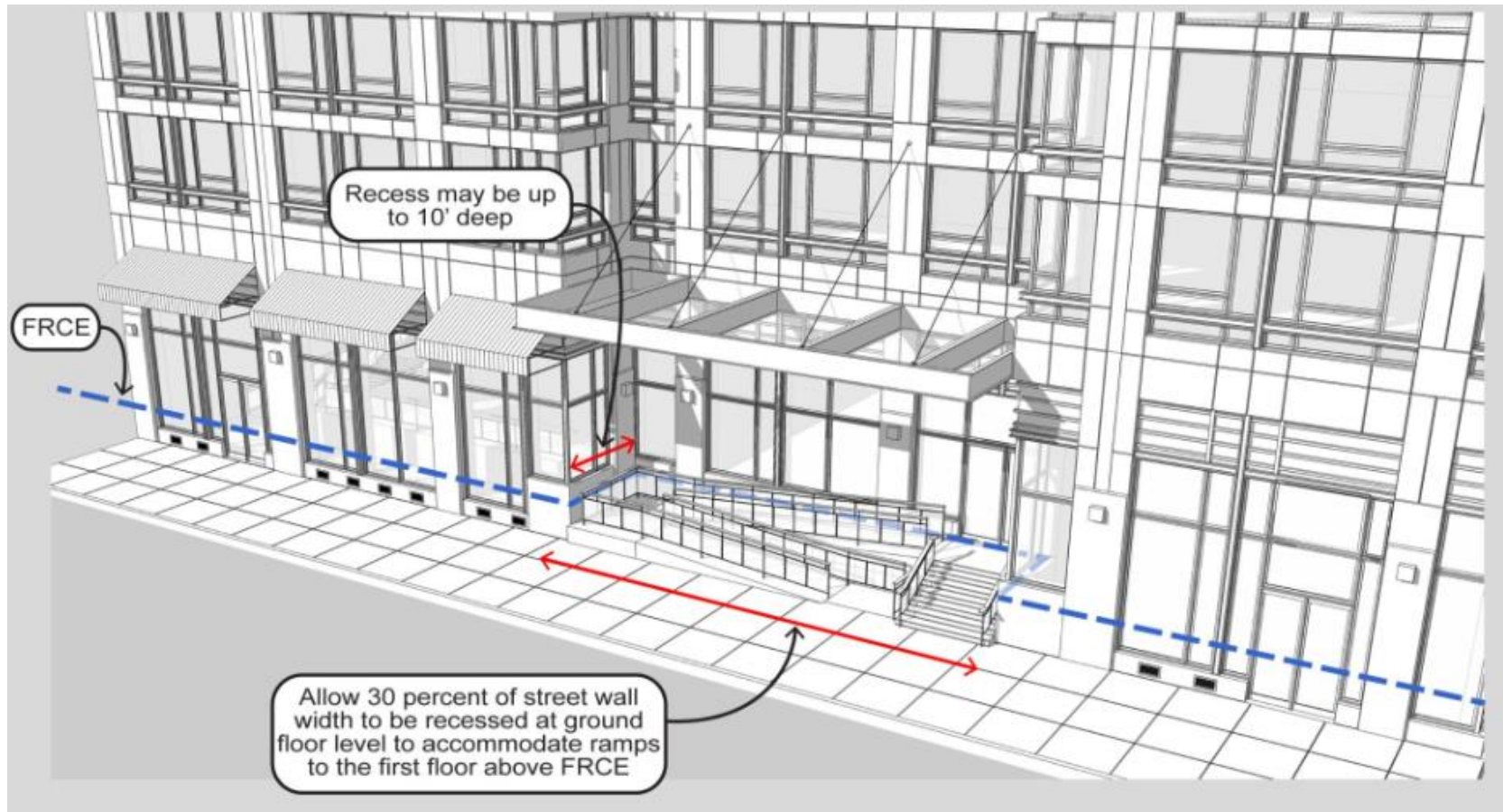


Above-grade cellar space
(Also exempt, in flood zones where
DFE above grade is more than 4½ ft.)

2013 Citywide Flood Text

Certain zoning design requirements were updated

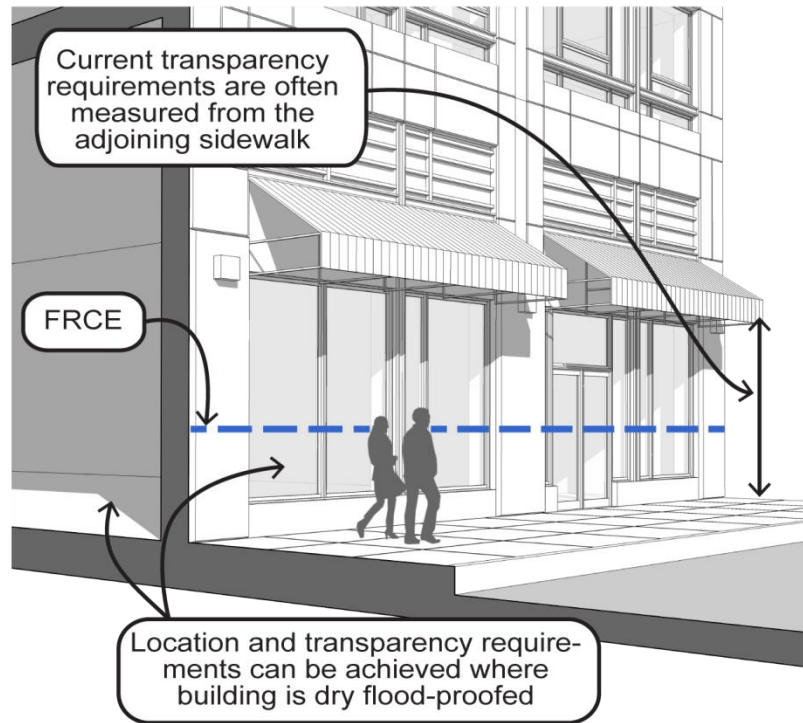
Elements of zoning which predate the new FEMA PFIRM and did not take significant flood levels (and flood resistant construction difficulties) into account were updated to ensure that new buildings could comply with these requirements while complying with Appendix G – these include street wall location requirements (below)



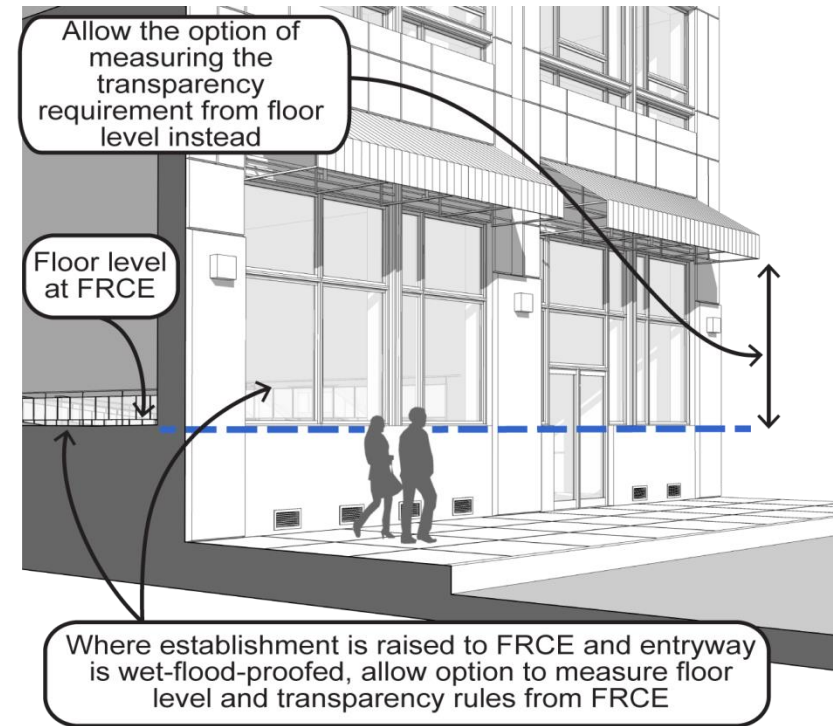
2013 Citywide Flood Text

Certain zoning design requirements were updated

Elements of zoning which predate the new FEMA PFIRM and did not take significant flood levels (and flood resistant construction difficulties) into account were updated to ensure that new buildings could comply with these requirements while complying with Appendix G – these include transparency requirements (depicted below) and ground floor use requirements.



Typical transparency requirements

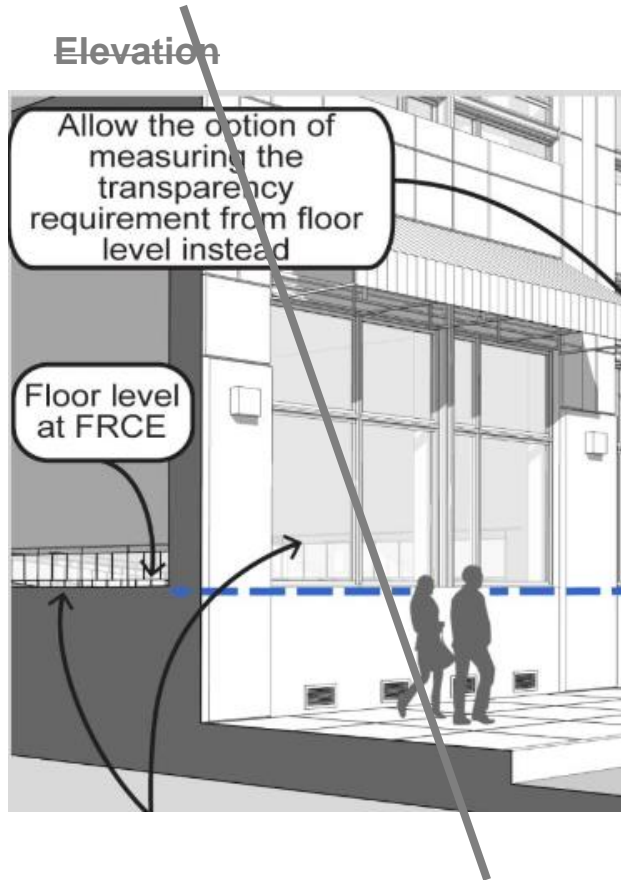


Optional reduced transparency

2013 Citywide Flood Text

Streetscape mitigations

When the DFE >10', or when the bump-up has been used, any new or enlarged building must provide streetscape mitigations. For residential buildings, this involves a glazed, at-grade lobby. For **mixed-use or commercial buildings**, we require:



Wet floodproofing



Dry floodproofing



For **mixed-use buildings** in **commercial districts**:
ZR 64-64 requires 50% transparency between 2'-12' above *curb level*.