Living Above the Street

Stewarding New York City's Historic Built Environment Towards Flood Resilience

DIGITAL REPORT 05

Adaptation Design Study: East Harlem

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About

This report is part of the independent research project “Living Above the Street: Stewarding New York City’s Historic Built Environment Towards Flood Resilience,” which is supported by Onera Foundation under 2022 Onera Prize for Historic Preservation.

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Further Readings

To view and download the whole series of policy & design reports, please visit:
https://www.livingabovethestreet.nyc/reports.

This Onera Prize research project is developed upon the author’s M.S. Historic Preservation thesis:
Wang, Ziming. 2022. “Living Above the Street: Flood Retrofitting and Adaptive Streetscape of New York City’s Historic Districts.” M.S. Historic Preservation Thesis, Columbia University.
https://doi.org/10.7916/fn43-vb19.

Cover Image:
Adapted Streetscape of East 118th Street in East Harlem Historic District During a Flood Event.
Rendering by the Author.

East Harlem Historic District possesses a residential character made up of speculative row houses, flats and tenements predominantly built in the late 19th century centering East 116th Street. The impressively long and intact rows of residential buildings contribute to a streetscape that is still typical of Harlem, but rarely found elsewhere in Manhattan.

See Designation Report of East Harlem Historic District, National Park Service, 2019.

1940 Tax Photo for 440 East 118th Street (Block 1711, Lot 32).
Courtesy of NYC Department of Records and Information Services.

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Executive Summary

Executive Summary

Paired with **Digital Report 04: Adaptation Design Study — South Street Seaport** which lays out flood adaptation strategies for the vibrant retail corridor of Front Street in South Street Seaport historic district, this report envisions the flood adaptation of East 118th Street — a **historic residential corridor** in East Harlem, New York City. Encompassing long and impressively intact groups of speculative row houses and embellished by larger-scaled residential buildings such as flats and tenements, the streetscape of the East 118th Street corridor represents the typical residential building types and urban forms found in New York City's historic neighborhoods. Contrary to the South Street Seaport design study where the author proposes more radical and experimental flood adaptation strategies in order to balance flood resilience with street-level interactivity, **the intention of the East Harlem Design Study is to identify feasible and relatively low-cost flood retrofitting strategies friendly to residential property owners, preferably involving limited spatial alterations.**

The findings of this design study demonstrate that by using already mature flood retrofitting solutions such as wet-floodproofing, dry-floodproofing and internal elevation, **residential structures (especially small-scaled structures like row houses) can be feasibly adapted towards flood resilience without substantial spatial alteration or streetscape change. However, such conclusion is valid only if necessary reforms and updates in historic preservation standards and flood regulations are made.** While the Landmarks Preservation Commission has published technical guidelines for equipment relocation and flood shield installation on locally designated historic structures, more extensive policy-making is needed to guide the whole process of flood retrofitting, as well as to cover a broader range of floodproofing interventions and regulate potential contradictions between preservation standards and general flood regulations; on the other hand, reforms in local flood regulations (Building Codes and Flood Zoning) that allow for more flexible choice of retrofitting strategies and better recognize streetscape-sensitive design treatments identified in this study will also benefit the adaptive transformation of historic streetscapes towards flood resilience.

Compared and contrasted with each other, Digital Reports 04 and 05 have together showcased how urban historic streetscapes may have different functions, characters and adaptation priorities, which lead to drastically divergent design strategies and outcomes. Such observation calls for the establishment of a site-specific scenario-planning procedure on block or neighborhood scale that helps set basic parameters for adaptation interventions, which will be further discussed in *Digital Report 06: Policy & Procedural Recommendations*.

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Adaptation Design Study:

East Harlem

Designation, Streetscape Significance, and Street Corridor Selection

Designated as a National Register Historic District in 2019, the East Harlem Historic District possesses a largely residential character made up of speculative row houses, flats and tenements centering the commercial spine of East 116th Street. Mostly built in the 1870s and 1880s in Italianate style, an extensive stock of row houses still exist today in long, impressively intact rows along cross streets in the district; they are supplemented by flats and tenements built slightly later and in smaller numbers, as well as some public and commercial buildings scattered among residential buildings. The large, intact groups of row houses and other historic residential buildings have contributed to a streetscape that is still typical of Harlem, but "rarely found elsewhere in Manhattan"; the historic transformation of housing typology in Harlem from row houses to flats and tenements also reflects the neighborhood's evolution from a middle-class enclave to an immigrant district housing working-class residents from East Europe, Italy, Puerto Rico and other regions (NPS 2019).

To compare and contrast with the South Street Seaport design study (see Report 04) which features a mixed-use street corridor with vibrant commercial atmosphere, this design study seeks to focus on a residential street corridor that represents the historic district's predominant building types. Upon consulting designation data and FEMA's flood maps, **East 118th Street between 1st Ave. and Pleasant Ave**. is selected for design study. As a residential street flanked largely by contributing buildings of the historic district, intact groups of row houses and tenements have created a consistent historic streetscape and a continuous street wall along this residential corridor; at the same time, the street's sloped topography poses interesting challenges for flood retrofitting. Due to its inclined terrain, the west end of the street section has an elevation of around 7.5 ft above sea level, while the east end is around 12.5 ft above sea level. Therefore, according to FEMA's PFIRM map, only the west two-thirds of the street section falls within the 1% floodplain, which has a local BFE of 12 ft above sea level; while the remaining east one-third falls within the 0.2% floodplain — where flood retrofitting is encouraged by New York City's Flood Zoning, but not required by the city's Building Code. In this study, flood retrofitting strategies are envisioned for buildings located in either the 1% or the 0.2% floodplain.

Residential structures have been placed at the center of New York City and FEMA's flood adaptation policy-making, and row houses ("Attached/Semi-Attached Residential Buildings") are identified as one of the most populous building types in New York City's floodplain (see Report 03). For these reasons, the East Harlem design study may be able to elicit findings that are not only of local applicability, but also relevant to other flood-threatened historic residential corridors across the city; discussions made in this design study may also be able to connect historic buildings with existing flood adaptation policy-making for residential homes at-large.

Site Map

National Register Historic District
NR District Contributing Buildings
1% Annual Chance Floodplain
0.2% Annual Chance Floodplain
LPC Individual Landmarks
Street Section for Design Study

0 500 ft

Historic Designation and Flood Risk Map.

Base Map: FEMA PFIRM Panels 3604970087G (2013) & 3604970091G (2015);
Data Sources: CRIS/Map PLUTO/LPC Landmarks Map.

Existing Condition Documentation

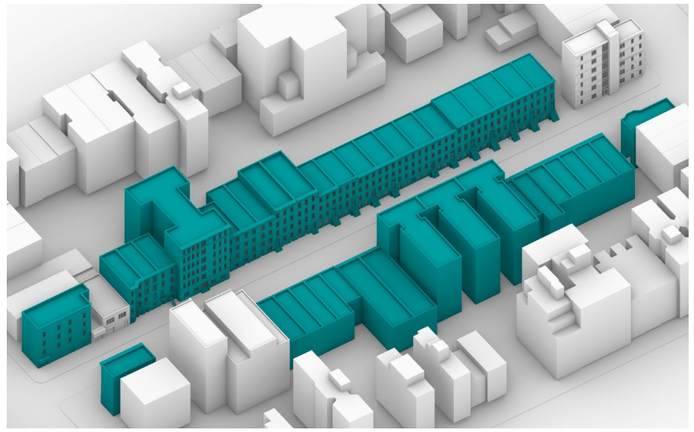
East 118th Street Between 1st Avenue & Pleasant Avenue, North Side.

East 118th Street Between 1st Avenue & Pleasant Avenue, South Side.

Current Street Elevation with DFE & Primary Residential Floor Elevations.

Street Elevation Data Source: NYC Open Data. Building Basement Data Source: MapPLUTO.

0 100 ft

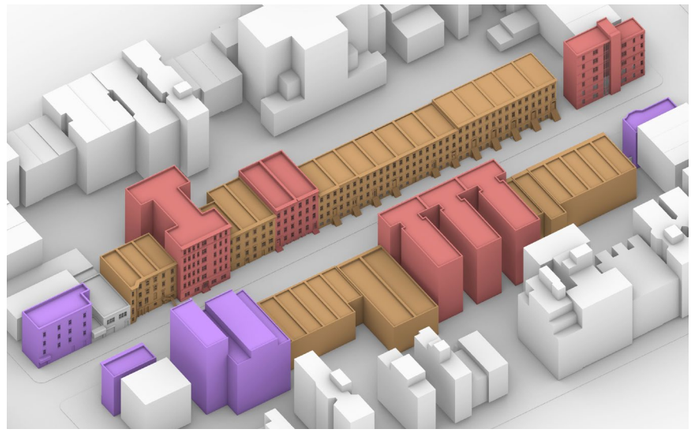


Building Age

Contributing

Non-Contributing

All three major historic building types of East Harlem — row houses, flats and tenements — are represented along the street. This street corridor retains an impressively intact human-scaled historic streetscape, with the only exception of two large-scaled contemporary developments.



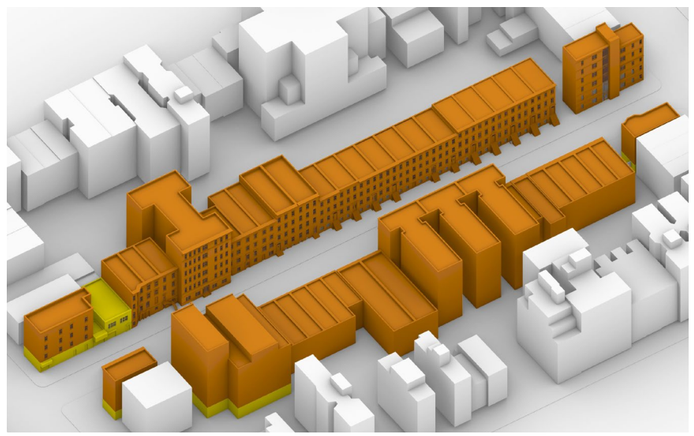
Building Type

Attached Residential

Mid-Rise Residential

Mid-Rise Mixed-Use

Attached residential buildings (row houses) make up the majority of the street corridor's building stock, supplemented by several mid-rise residential or mixed-use buildings (flats, tenements, new developments).



Building Use by Floor

Retail

Residential

The 118th street corridor showcases a largely residential character. Several retail units (e.g. grocery store and barbershop) exist on the street floor of residential buildings near 1st and Pleasant Avenues.

Building Profile: Age, Type, and Use.

Existing Streetscape & Evaluation

Flood Resilience

1.75

Building Integrity & Visual Consistency

4.00

Streetscape Experience & Social-Spatial Relationship

4.40

Floor Area Transfer

Estimated Overall FAR: 2.71 ;

Estimated Total Usable Floor Area: 255,800 sqft.

Retrofitting Strategy Mapping & Key Retrofitting Treatments

Streetscape Evaluation & Overall Intention

Unlike the case for profit-generating commercial structures, residential property owners may be more sensitive to the cost and feasibility of flood retrofitting projects; furthermore, potential reductions in flood insurance premium may also serve as an important incentive. To transform the East 118th street corridor towards flood resilience while preserving its intact historic fabric and human-scaled, residential characters, this design study seeks to:

- **Develop low-cost and practical retrofitting strategies that involve limited spatial alterations, which help to both enhance the feasibility of retrofitting projects, and preserve the street corridor's historic characters;**
- **If possible, prioritize strategies recognized by New York City's Building Code, FEMA's floodplain management standards, and NYCLPC's technical guidelines on equipment relocation and dry floodproofing. Compliance with these rules will streamline the permit process for property owners, as well as bring opportunities in flood insurance premium reduction.**

Under the intentions set above, the following sections lay out possible retrofitting strategies for the street corridor's major building types (row houses/attached residential, mid-rise residential, and mid-rise mixed-use), and assign them for each building along the street corridor.

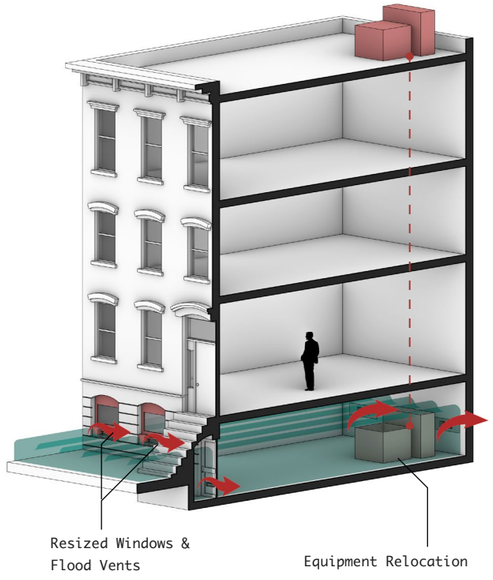
Row Houses: Low DFE Scenario vs. High DFE Scenario

If a row house along the street corridor has a stoop and a partially above-ground basement, then local DFE (which is on average 4 feet above street level) is likely below its primary residential floor; on the contrary, if a row house doesn't have a stoop and is directly entered at street level, then local DFE will be above its primary residential floor (which means floodwater may directly impact living spaces). For easier reference, this report names the former situation "Low DFE Scenario," and the latter "High DFE Scenario."

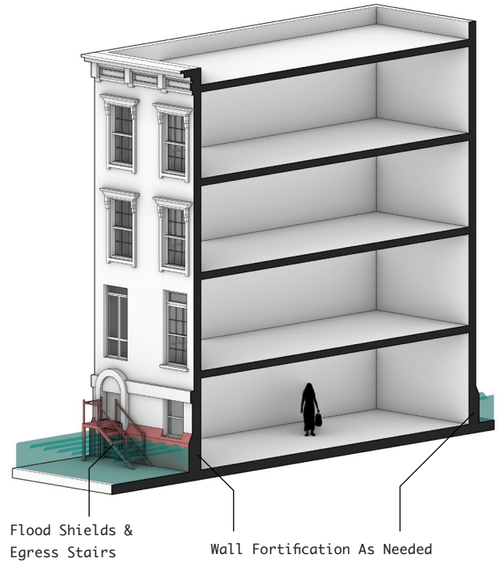
Low DFE Scenario: Wet-Floodproofing the Basement

If the established flood level is beneath a row house's primary residential floor, then the structure can be simply wet-floodproofed under DFE. Specifically, flood vents shall be installed on basement walls, and basement windows shall either be replaced with flood damage-resistant materials, or be relocated above flood level. Critical equipment inside the basement shall be relocated onto the rooftop, pursuant to NYC Landmarks Preservation Commission's technical guideline for relocating mechanical equipment.

The wet-floodproofing strategy complies with the general rule for residential structures set out by Appendix G of New York City's Building Code. However, **it should be noted that besides wet-floodproofing measures, both NYC's current Building Code and NFIP's insurance premium reduction standards require the whole basement to be filled in residential structures** (see NYC Building Code G304.1.1; NYCDCP 2014). Nevertheless, for feasibility considerations, a number of studies have advocated for the wet-floodproofing or dry-floodproofing, instead of elimination, of basement spaces (NYCDCP 2014, 69; NYCDCP 2016, 4; Boston 2018, 16). In this case, given considerations on feasibility, historic fabrics and streetscape implications, wet-floodproofing of the basement is recommended. **If the property owner chooses to fill the basement instead of wet-floodproofing, the areaway should still be retained, and decorative fenestration shall be made on the basement wall facing areaway** (see "Attached Residential" section of Report 03).



Low DFE Scenario



High DFE Scenario

High DFE Scenario: Dry-Floodproofing First-Floor Door & Windows

If a row house is directly entered from street level, then local DFE is likely several feet above its first floor. In this case, the structure is recommended to be dry-floodproofed. First-floor doors and windows shall be sealed with deployable flood shields, and wall sections under the DFE may be fortified as needed; alternatively, first-floor window openings may be relocated above flood level, if such intervention only involves minimal form change. In addition to main entrances on street level, some buildings along the street corridor have stairs leading from the street to the second floor (see street elevation documentation); if no such arrangement is present and all egress routes are blocked by dry-floodproofing shields, then egress stairs shall be designed and installed together with

flood shields (see “Attached Mixed-Use” section of Digital Report 03; Digital Report 04; and case studies in this report for instances). Since structures along the street corridor typically incorporate front yards, the installation of deployable egress stairs is not likely to cause intrusion to sidewalk spaces.

Dry-floodproofing may be a far more feasible solution in the High DFE Scenario as compared to wet-floodproofing, which requires either abandoning the first residential floor and turning it into storage or access use, or relocating the first residential floor up to the rooftop through rooftop addition (see “Attached Residential” section of Digital Report 03). **Although NYCLPC’s technical guidelines for flood shields and barriers encourages the dry-floodproofing of historic structures, dry-floodproofing a residential structure is not yet recognized by NYC Building Code or FEMA standards. Some policy reform would be needed to address this contradiction, and further recognize dry-floodproofing as a feasible retrofitting strategy for historic residential structures that involves minimal spatial change and structural reconfiguration.**

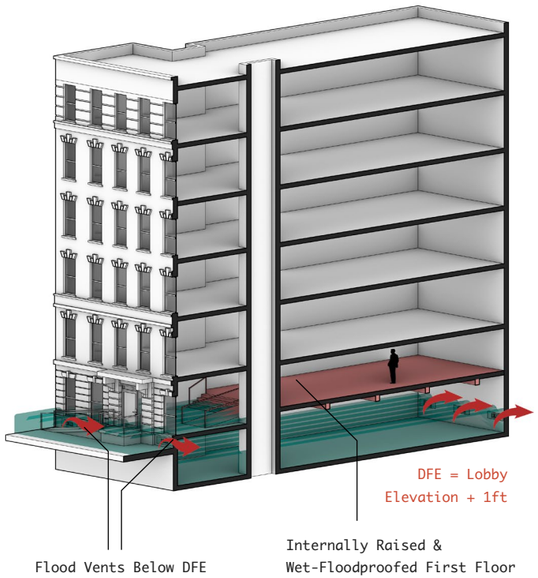
Mid-Rise Residential: Interior Elevation or First-Floor Function Conversion

The mid-rise residential buildings (mostly tenements) along the street corridor typically have lobbies slightly raised from street level and accessed through several steps of stairs. Based on the height difference between DFE and the first floor, two different strategies may be adopted:

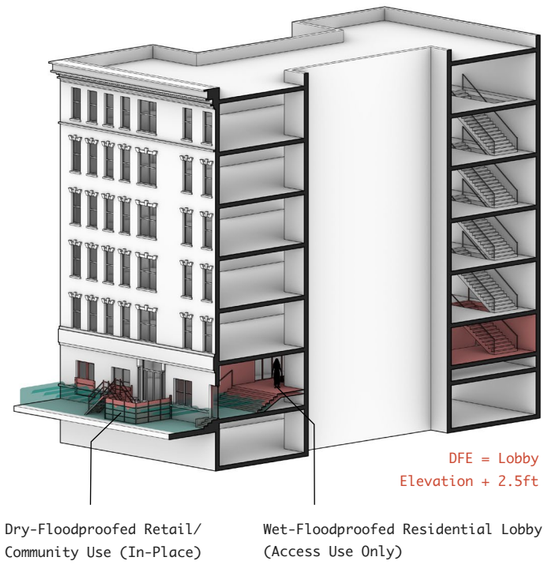
If local DFE is only slightly (e.g. 1 ft) higher than a building’s first floor, then a modest elevation of the first floor’s floorplate would suffice to bring all living spaces above flood elevation. Accompanying the elevation of the first floor, the basement space shall be wet-floodproofed.

If local DFE is significantly (e.g. 3 ft) higher than a building’s first floor, and that interior elevation intervention would seriously impact the first floor’s ceiling height, then the building’s first floor is recommended to remain at the original height, and be converted into community or retail use. This intervention turns the structure from Mid-Rise Residential to Mid-Rise Mixed-Use; then, the new community or retail use on street level shall be dry-floodproofed, while the residential lobby shall be wet-floodproofed.

These two strategies are both relatively feasible, and respectful to historic tenement buildings’ spatial layouts. **Similar to the case of row houses, although these strategies are in accordance with the general rules set out by New York City’s Building Code (wet-floodproofing and structural elevation for residential structures, and in-place dry-floodproofing option for non-residential structures), some policy reforms — such as allowing the existence of basements and allowing the “mix-and-match” of floodproofing treatments (see Digital Report 04 for instances) — are needed for these strategies to be fully recognized by Building Code.** As recommended practices for the flood retrofitting of mid-rise residential structures, both of the strategies listed above are discussed in more detail in the “Mid-Rise Residential” section of Digital Report 03.



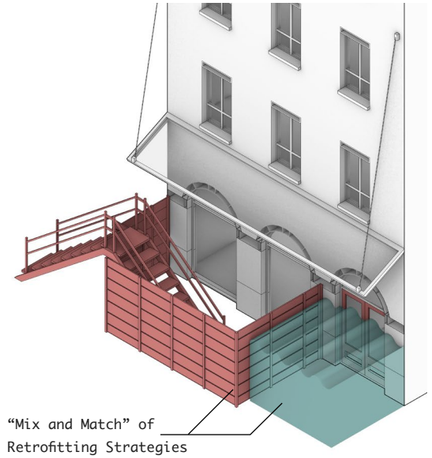
Mid-Rise Residential: Interior Elevation



Mid-Rise Residential: First-Floor Function Conversion

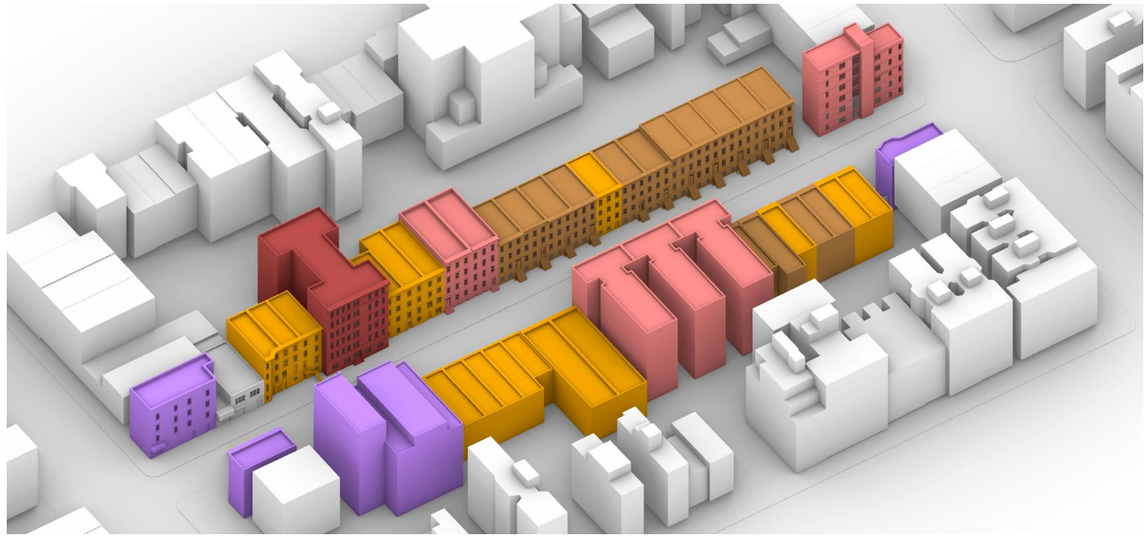
Mid-Rise Mixed-Use: “Mix-and-Match”

For the small number of mid-rise mixed-use structures along the street corridor, dry-floodproofing for retail or community use on street level is recommended, while the residential lobby shall be wet-floodproofed. Such “mix-and-match” strategy brings the same result as the second scenario (first-floor function conversion) discussed above for mid-rise residential structures; more detailed design strategies and case studies may be seen in the “Mid-Rise Mixed-Use” section of Digital Report 03, as well as the South Street Seaport design study featured in Digital Report 04.



Retrofitting Strategy Mapping

Corresponding to flood retrofitting strategies laid out in the previous sections, the illustration on the next page maps overall retrofitting methods assigned to each structure along the street corridor.



A1 Row House | Low DFE Scenario

A2 Row House | High DFE Scenario

B1 Mid-Rise Residential | Interior Elevation

B2 Mid-Rise Residential | First-Floor Function Conversion

C Mid-Rise Mixed-Use | “Mix-and-Match”

Streetscape Change and Policy Reforms

Since this design study seeks to explore feasible flood retrofitting strategies suitable for historic residential structures, most recommended practices are in-place wet-floodproofing or dry-floodproofing treatments that won’t involve significant spatial alteration or layout modification (major spatial changes are more frequently proposed for mixed-use structures studied in Digital Report 04). Therefore, not much permanent streetscape change would result from these flood retrofitting interventions — which potentially helps property owners to go through preservation design review processes. However, as mentioned in previous sections, key policy reforms are still necessary in order for retrofitting strategies identified in this design study to be recognized by current flood regulations on local and Federal level. Key areas of potential policy reform include:

- **Allowing the basements of residential structures to continue to exist, on condition that they are wet-floodproofed or dry-floodproofed;**
- **Allowing dry-floodproofing for residential structures with relatively mild flood risk;**
- **Allowing the “mix-and-match” of dry-floodproofing and wet-floodproofing on mixed-use structures.**

Retrofitted Streetscape | Permanent

Flood Resilience

3.00 (▲ 1.25)

Building Integrity & Visual Consistency

4.00 (▼ 0.00)

Streetscape Experience & Social-Spatial Relationship

4.29 (▼ 0.11)

Floor Area Transfer

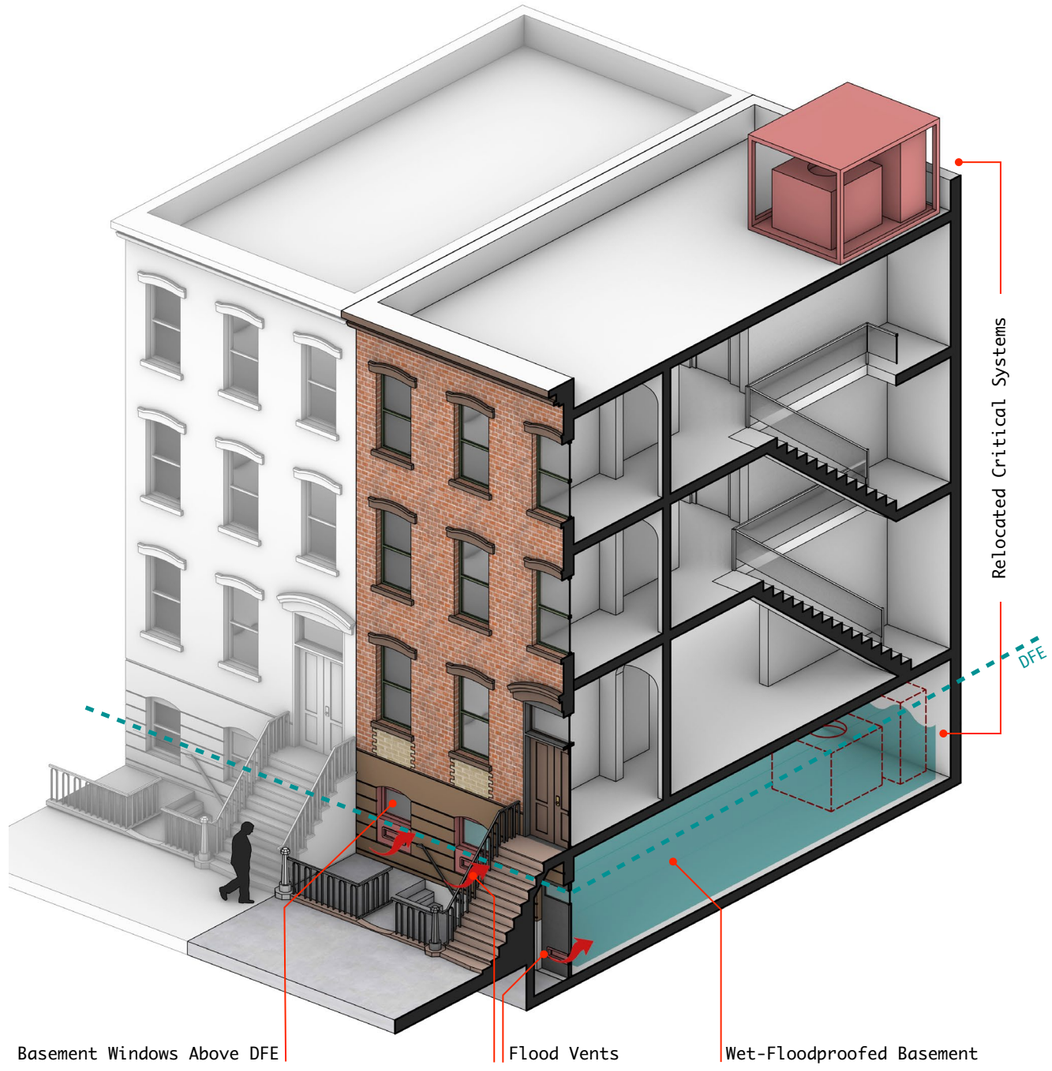
Est. Overall FAR: 2.67 (▼ 0.04) ;

Est. Total Usable Floor Area: 252,400 (▼ 3,400) sqft.

Retrofitted Streetscape | During Flood Event

In advance of anticipated flood events, deployable flood shields shall be set up for row houses adapted under the High DFE Scenario as well as for all non-residential uses. Temporary egress stairs shall also be placed next to dry-floodproofing enclosures, in order to serve emergency evacuation needs. Row houses adapted under the Low DFE Scenario and tenements and flats with their first floors elevated will utilize flood vents to allow floodwater to enter and exit beneath primary residential floor.

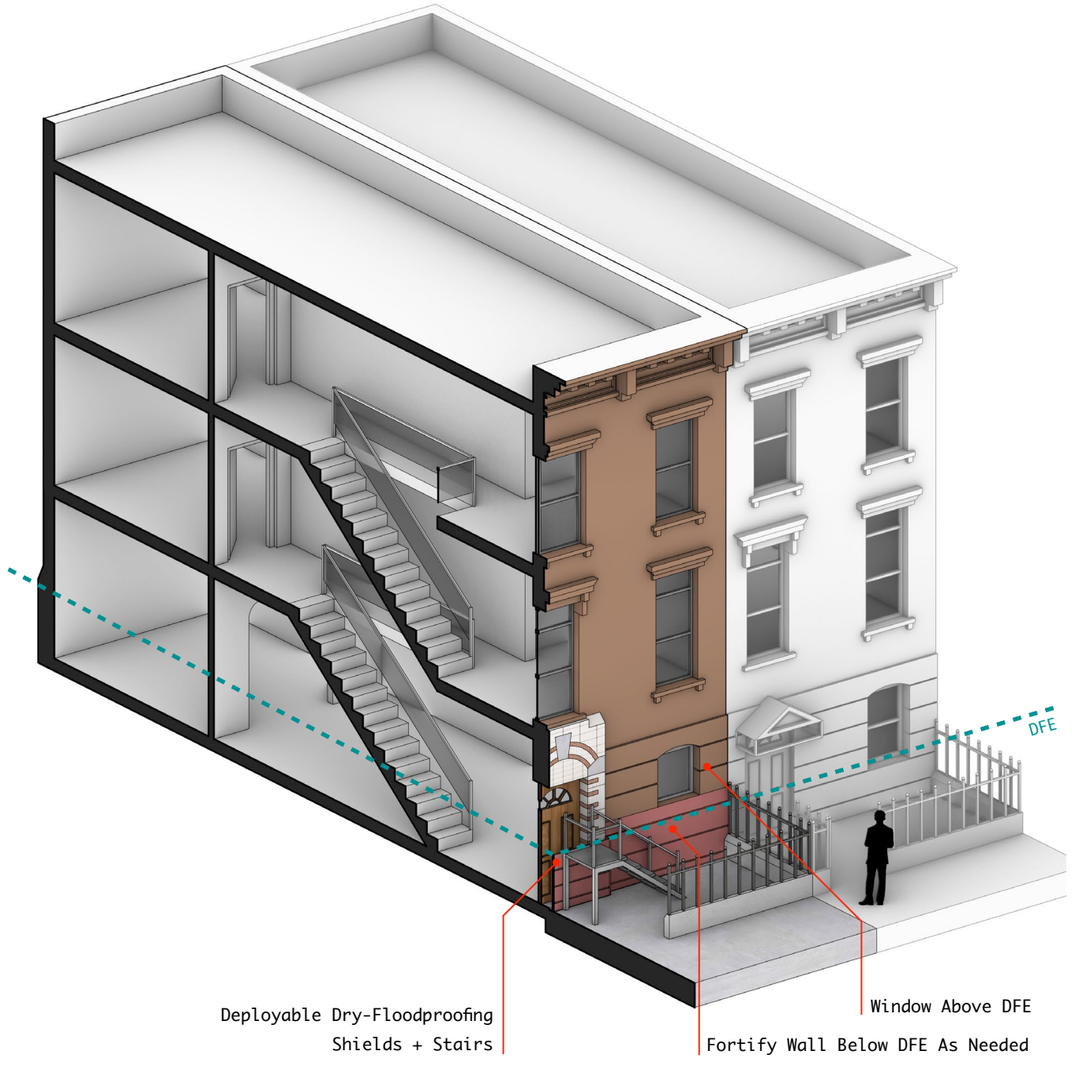
Case Study | 429 East 118th Street



Built Year: c. 1875 (NPS Data). **Type:** Row House with Stoop and Basement.
Retrofitting Strategy: Wet-Floodproofing ("Low DFE Scenario").

This row house with front stoop represents the **"Low DFE Scenario"** — where local DFE is below the primary residential floor. In this case, the structure shall be wet-floodproofed, with the basement serving as a temporary storage for flood water. Necessary interventions under this scenario include placing flood vents, relocating basement windows above DFE, and moving critical systems onto the rooftop.

Case Study | 412 East 118th Street

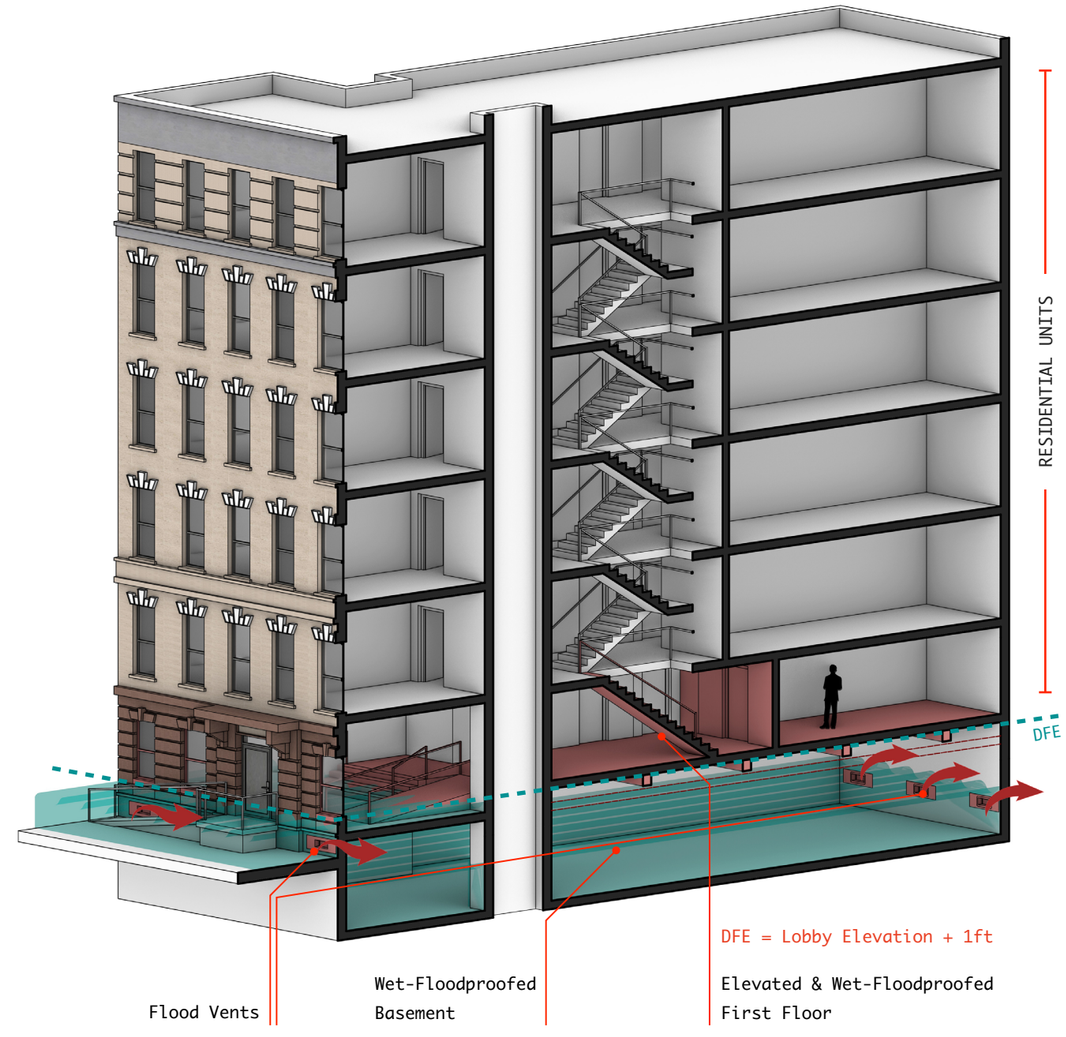


Built Year: 1877; Subsequently Refaced (NPS Data). **Type:** Row House without Stoop.

Retrofitting Strategy: Dry-Floodproofing ("High DFE Scenario").

Entered directly from street level, this row house represents the **"High DFE Scenario"** where local DFE is several feet higher than the primary residential floor. Given the relatively mild flood height (about 3.5 ft above ground), this structure is recommended to be dry-floodproofed. First-floor windows shall be moved above DFE; wall below DFE shall be fortified as needed; deployable flood shields and egress stairs shall be installed prior to flood events.

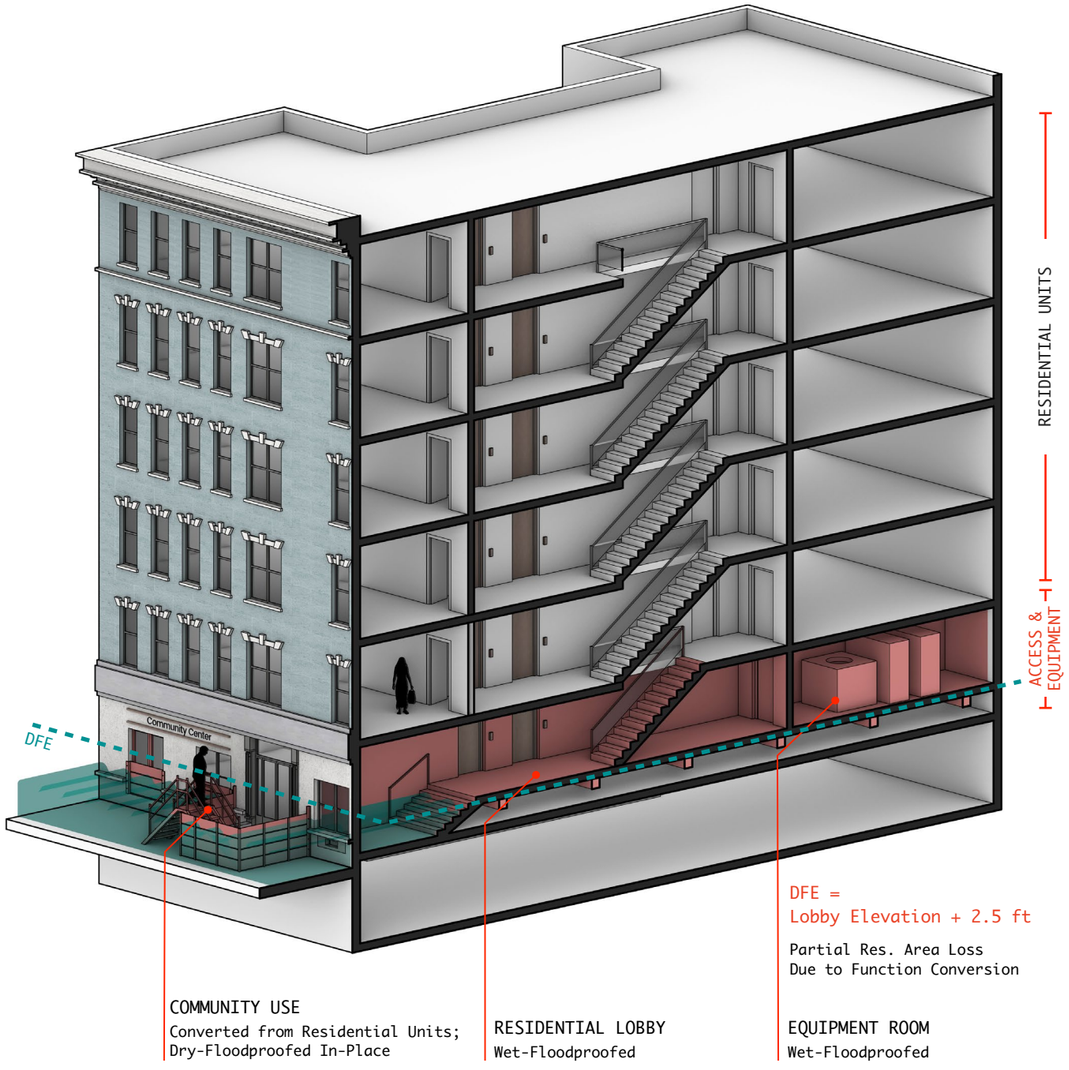
Case Study | 430 East 118th Street



Built Year: 1906 (NPS Data). **Type:** Mid-Rise Residential.

Retrofitting Strategy: Wet-Floodproofing and Interior Elevation.

This tenement building has its lobby above street level, and local DFE is just around 1 ft higher than existing lobby elevation. In this case, slightly raising the first floor from the interior would suffice to bring all residential spaces above DFE. As stairs and ramp are added into the lobby space, all residential units may remain in place; and the basement shall be wet-floodproofed utilizing flood vents.



Built Year: 1907; Subsequently Refaced (NPS Data). **Type:** Mid-Rise Residential.

Retrofitting Strategy: First-Floor Function Conversion.

This tenement building has a local DFE 2.5 ft higher than lobby level, which restricts the applicability of interior elevation because such intervention would significantly impact ceiling height. In this case, the first floor is recommended to be converted into community use and dry-floodproofed in-place; the remaining residential lobby shall be wet-floodproofed, and serve access and storage functions only.

Flood Adaptation, Streetscape Change & Policy Reform

This design study has revealed that by utilizing already-mature flood retrofitting solutions such as wet-floodproofing, dry-floodproofing and internal elevation, residential structures (especially small-scaled structures like row houses) can be feasibly adapted towards flood resilience without substantial spatial alteration or streetscape change. Unlike the design schemes proposed for mixed-use structures in Digital Report 04 which largely involve wholesale rehabilitation, the flood retrofitting of residential structures may often be achieved through a combination of incremental interventions (e.g. installation of flood vents, relocation of critical equipment, and dry-floodproofing wall sections under DFE).

However, such vision is valid only if necessary reforms and updates in historic preservation standards and flood regulations are made. Although New York City's Landmarks Preservation Commission has already published technical guidelines for equipment relocation and flood shield installation on locally designated historic structures, more extensive policy-making is still urgently needed to guide the whole process of flood retrofitting, as well as to cover a broader range of floodproofing interventions and to regulate potential contradictions between preservation standards and general flood regulations. On the other hand, reforms in local flood regulations (Building Codes and Flood Zoning) that recognize the continued existence of basements, dry-floodproofing option for residential structures, and "mix-and-match" of dry and wet-floodproofing for mixed-use structures will also be critical, since they will help resolve standard compliance issues for streetscape-sensitive retrofitting design strategies identified in this study, and open up opportunities for flood insurance premium reduction and other potential financial incentives.

Tradeoffs in Streetscape Significance

Comparing two sets of streetscape evaluation scores before and after proposed adaptation intervention, it can be observed that the mostly in-place interventions recommended in this study are not likely to bring major impacts to the formal and experiential values of East Harlem's residential historic streetscape. However, due to several interior elevation and function conversion cases that require additional space for access use, some usable floor area loss would still be inevitable.

Given the repetitive and grouped nature of speculative row houses and tenements, new forms on street level created by flood adaptation interventions (e.g. flood vents under basement windows) will have the potential to achieve a rhythm compatible with historic architectural and urban forms, which may be considered as an additional layer of the streetscape's formal evolution and historic significance.

Appendix: Current Streetscape Evaluation Sheet

Flood Resilience | 1.75

	1	2	3	4	5
Average lowest residential floor elevation as compared to BFE & DFE	< BFE – 4ft	≥ BFE – 4ft	≥ BFE	≥ DFE	≥ DFE+1ft
Percentage of areas with active use on street level	≥ 80%	80 – 60%	60 – 40%	40 – 20%	< 20%
Percentage of flood-proofed area on street level	< 20%	20 – 40%	40 – 60%	60 – 80%	≥ 80%
Percentage of basement area as compared to street-floor building floor area	≥ 80%	80 – 60%	60 – 40%	40 – 20%	< 20%

Building Integrity & Visual Consistency | 4.00

	1	2	3	4	5
Percentage of identifiable historic structures along both sides of the corridor	< 20%	20 – 40%	40 – 60%	60 – 80%	≥ 80%
Current condition of historic structures	Poor	Fair	Average	Good	Excellent
Extent of existing modification to historic facades	Extensive	High	Medium	Low	Very Low
Number of identifiable historic architectural elements and ornaments on street level	Scarce	Few	Moderate	Frequent	Abundant
Permanent material impact brought by flood retrofitting (for retrofitted streetscape only)	Extensive	High	Medium	Low	Very Low
Permanent visual impact on rooftops brought by flood retrofitting (for retrofitted streetscape only)	Extensive	High	Medium	Compatible	Invisible
Permanent physical impact on street space brought by flood retrofitting (for retrofitted streetscape only)	Extensive	High	Medium	Compatible	Invisible

Streetscape Experience & Social-Spatial Relationship | 4.40

	1	2	3	4	5
Percentage of continuous street wall along both sides of the street corridor	< 20%	20 – 40%	40 – 60%	60 – 80%	≥ 80%
Percentage of street-level transparency (for mixed-use/commercial corridor only)	< 20%	20 – 40%	40 – 60%	60 – 80%	≥ 80%
Percentage of active use along both sides of the street	< 20%	20 – 40%	40 – 60%	60 – 80%	≥ 80%
Percentage of storefronts with outdoor dining/seating (for mixed-use/commercial corridor only)	< 20%	20 – 40%	40 – 60%	60 – 80%	≥ 80%
Average main entrance elevation of structures on both sides of the street as compared to street level	≥ 4ft	3–4ft	2–3ft	1–2ft	< 1ft
Identifiable architectural patterns (fenestration, pilasters, etc.) on street level	Scarce	Few	Moderate	Frequent	Abundant
Number of storefronts, awnings, canopies and signage (for mixed-use/commercial corridor only)	Scarce	Few	Moderate	Frequent	Abundant
Liminal space for pedestrian passage / Ability to walk along the sidewalk	Very Low	Low	Acceptable	Good	High
Permanent visual impact on rooftops brought by flood retrofitting (for retrofitted streetscape only)	Extensive	High	Medium	Compatible	Invisible
Estimated pedestrian behavioral/mind map change brought by flood retrofitting (for retrofitted streetscape only)	Extensive	High	Medium	Low	Very Low

Appendix: Retrofitted Streetscape Evaluation Sheet

Flood Resilience | 3.00

	1	2	3	4	5
Average lowest residential floor elevation as compared to BFE & DFE	< BFE – 4ft	≥ BFE – 4ft	≥ BFE	≥ DFE	≥ DFE+1ft
Percentage of areas with active use on street level	≥ 80%	80 – 60%	60 – 40%	40 – 20%	< 20%
Percentage of flood-proofed area on street level	< 20%	20 – 40%	40 – 60%	60 – 80%	≥ 80%
Percentage of basement area as compared to street-floor building floor area	≥ 80%	80 – 60%	60 – 40%	40 – 20%	< 20%

Building Integrity & Visual Consistency | 4.00

	1	2	3	4	5
Percentage of identifiable historic structures along both sides of the corridor	< 20%	20 – 40%	40 – 60%	60 – 80%	≥ 80%
Current condition of historic structures	Poor	Fair	Average	Good	Excellent
Extent of existing modification to historic facades	Extensive	High	Medium	Low	Very Low
Number of identifiable historic architectural elements and ornaments on street level	Scarce	Few	Moderate	Frequent	Abundant
Permanent material impact brought by flood retrofitting (for retrofitted streetscape only)	Extensive	High	Medium	Low	Very Low
Permanent visual impact on rooftops brought by flood retrofitting (for retrofitted streetscape only)	Extensive	High	Medium	Compatible	Invisible
Permanent physical impact on street space brought by flood retrofitting (for retrofitted streetscape only)	Extensive	High	Medium	Compatible	Invisible

Streetscape Experience & Social-Spatial Relationship | 4.29

	1	2	3	4	5
Percentage of continuous street wall along both sides of the street corridor	< 20%	20 – 40%	40 – 60%	60 – 80%	≥ 80%
Percentage of street-level transparency (for mixed-use/commercial corridor only)	< 20%	20 – 40%	40 – 60%	60 – 80%	≥ 80%
Percentage of active use along both sides of the street	< 20%	20 – 40%	40 – 60%	60 – 80%	≥ 80%
Percentage of storefronts with outdoor dining/seating (for mixed-use/commercial corridor only)	< 20%	20 – 40%	40 – 60%	60 – 80%	≥ 80%
Average main entrance elevation of structures on both sides of the street as compared to street level	≥ 4ft	3–4ft	2–3ft	1–2ft	< 1ft
Identifiable architectural patterns (fenestration, pilasters, etc.) on street level	Scarce	Few	Moderate	Frequent	Abundant
Number of storefronts, awnings, canopies and signage (for mixed-use/commercial corridor only)	Scarce	Few	Moderate	Frequent	Abundant
Liminal space for pedestrian passage / Ability to walk along the sidewalk	Very Low	Low	Acceptable	Good	High
Permanent visual impact on rooftops brought by flood retrofitting (for retrofitted streetscape only)	Extensive	High	Medium	Compatible	Invisible
Estimated pedestrian behavioral/mind map change brought by flood retrofitting (for retrofitted streetscape only)	Extensive	High	Medium	Low	Very Low

03

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