

Executive Summary

Industrial building located along the waterfront in Red Hook, Brooklyn that typifies New York City's aging industrial building stock.

Citation: Irma and Paul Milstein of United States History, Local History and Genealogy. The New York Public Library. (1937). Brooklyn: Ferris Street -Dikeman Street. Hurricane Sandy provided a powerful reminder of the vulnerabilities that New York City's residents and businesses face due to flooding and coastal storms. Due to historic development patterns that caused industrial businesses to locate in areas with maritime access, a significant portion of the low-lying neighborhoods heavily impacted by Hurricane Sandy, and in the floodplain generally, contain large concentrations of industrial businesses. These facilities, such as wholesale warehouses, construction yards, and recycling facilities, serve critical functions that support the city's growing population and economy.

Industrial businesses face several unique challenges related to flood protection. The city's industrial building stock is aging, with more than 87 percent of these facilities built before the City adopted its first flood maps or enacted floodplain regulations. The majority of these are single-story buildings with large floorplates that provide little flexibility to relocate equipment, inventory, or production space to areas with less risk of flood damage. As part of the National Flood Insurance Program (NFIP) adminstered by the Federal Emergency Management Agency (FEMA), communities must comply with flood-resistant construction standards. Permitted strategies to retrofit nonresidential buildings include the following options:

- 1 Elevating the lowest floor above the expected flood elevation, or
- 2 Dry floodproofing the entire building to prevent floodwaters from penetrating the exterior.

However, for many industrial facilities in NYC, fully complying with these standards is cost prohibitive, or in some cases structurally infeasible. Compounding this challenge, few industrial businesses have active flood insurance policies, and for those that do, the coverage cap is frequently below the value of their assets in the floodplain.

Industrial Resiliency Best Practices

Fortunately, many businesses have found ways to proactively address flood risk and prepare for future events. Others are looking for solutions that will protect their investments and ensure continuity of operations, even if they are unable to fully meet the required flood-resistant construction standards. These strategies include targeted protection of electrical and mechanical systems within buildings, such as elevated platforms or waterproof rooms to house substations, electrical panels, generators, HVAC systems, and other high-value building components.



Large industrial facility in Gowanus, Brooklyn where structural elevation or dry floodproofing to comply with FEMA standards would be cost prohibitive. Elevated mezzanines give industrial businesses more flexibility to relocate equipment and inventory in advance of expected floods. Modifications to zoning and federal floodplain management requirements could encourage similar retrofits to improve industrial resiliency.



Preparedness planning is also an essential strategy to reduce risk and quickly resume operations following a storm. Truck relocation planning, clearly defined protocols to move inventory and equipment out of harm's way, and techniques to secure hazardous materials and unenclosed inventory can ensure that the industrial floodplain is more resilient to future floods and coastal storms.

Several opportunities exist for the public sector to encourage industrial businesses to pursue these resiliency strategies. Modifications to the City's zoning resolution could allow for more flexibility to create elevated space within existing buildings. Incorporating standards within the NYC Building Code for unenclosed storage of materials and equipment on industrial sites could help ensure that sites are adequately designed to address flood risk. Technical and financial assistance to support mitigation and preparedness could be designed to encourage continuity of operations planning and emergency truck relocation. At the federal level, modifications to FEMA's National Flood Insurance Program to recognize a wider range of flood mitigation actions could both promote resiliency retrofits and increase the number of businesses with active flood insurance policies.

Long Island City, Queens

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