Cloudburst Flooding Mitigation

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HOW TO ACT ?

Framework :
Integrated Gray–Green Cloudburst Design

Absorb: Green infrastructure (rain gardens, tree pits, permeable pavements, green roofs)

Store: Floodable courts and parks, plus underground storage to hold cloudburst water for a few hours

Transfer: Upgraded pipes, inlets and street grading to safely move water to storage areas

Goal: **Reduce cloudburst flooding in vulnerable communities while improving public space**

Solution 1 -
Site-Scale: Cloudburst Streets & Buildings

Cloudburst streets and buildings use green infrastructure to slow, store, and absorb stormwater.

Goal: keep water in green spaces first, and only send excess to pipes.

Solution 2 -
Neighborhood-Scale Cloudburst Hub

Neighborhood cloudburst hubs temporarily store stormwater in parks or open spaces before slowly releasing it.

Goal: hold a cloudburst event for a few hours to reduce flooding at critical hotspots.

Solution 3 -
Infiltration Basin

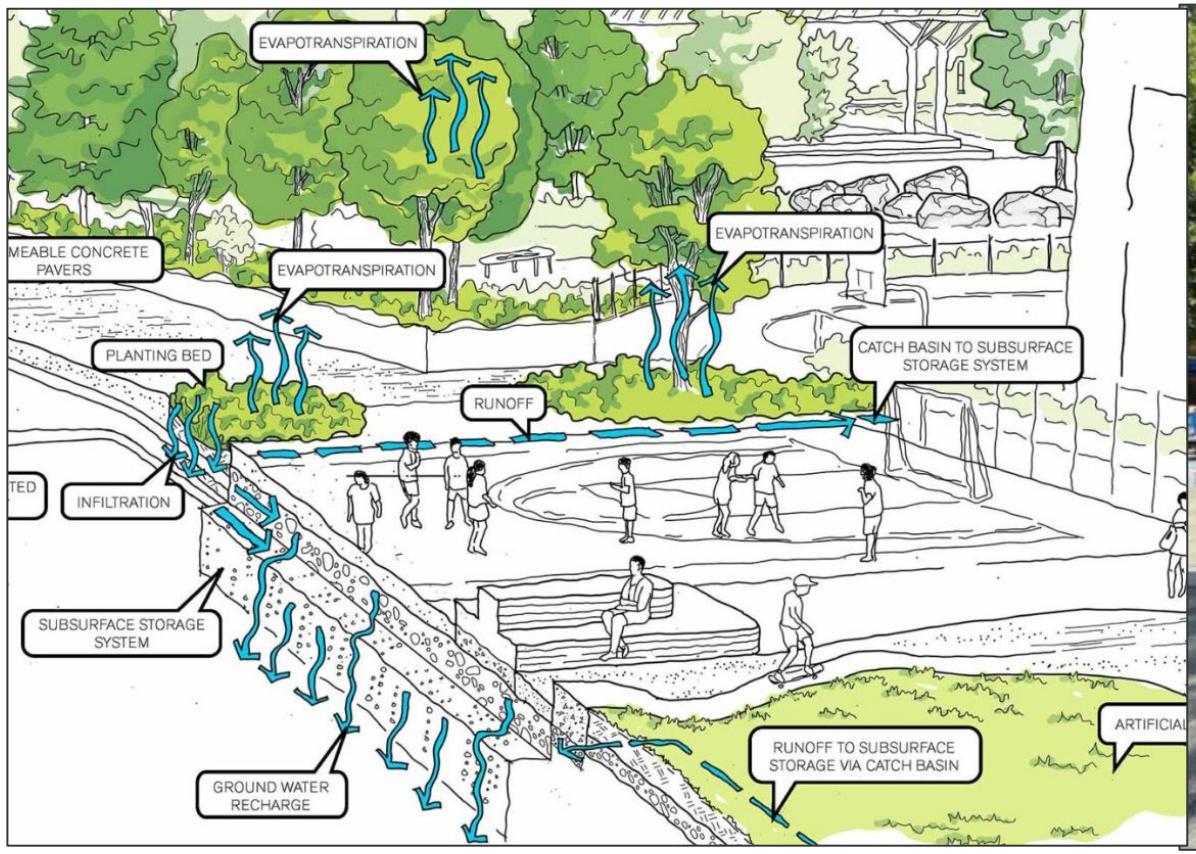
Infiltration basins capture stormwater and let it soak naturally into the ground

Goal: reduce runoff by using permeable soils to absorb water efficiently and cost-effectively

Solution 4 -
Corona Cloudburst Hub

Record-breaking rainfall on October 30, 2025 caused rapid flash flooding across NYC, especially Queens.
Goal: show why neighborhood-scale cloudburst hubs are needed to manage extreme, short-duration storms.

Example of Jefferson House



NYCHA Jefferson Houses Cloudburst Resiliency - Grain Collective

Cloudburst Projects at 8 Developments Will Manage Stormwater, Reduce Flooding, and Improve Open Spaces - The NYCHA Journal

Conversion of Bike Lanes to Pervious Roads

Fig 10: Bike Routes in New York City

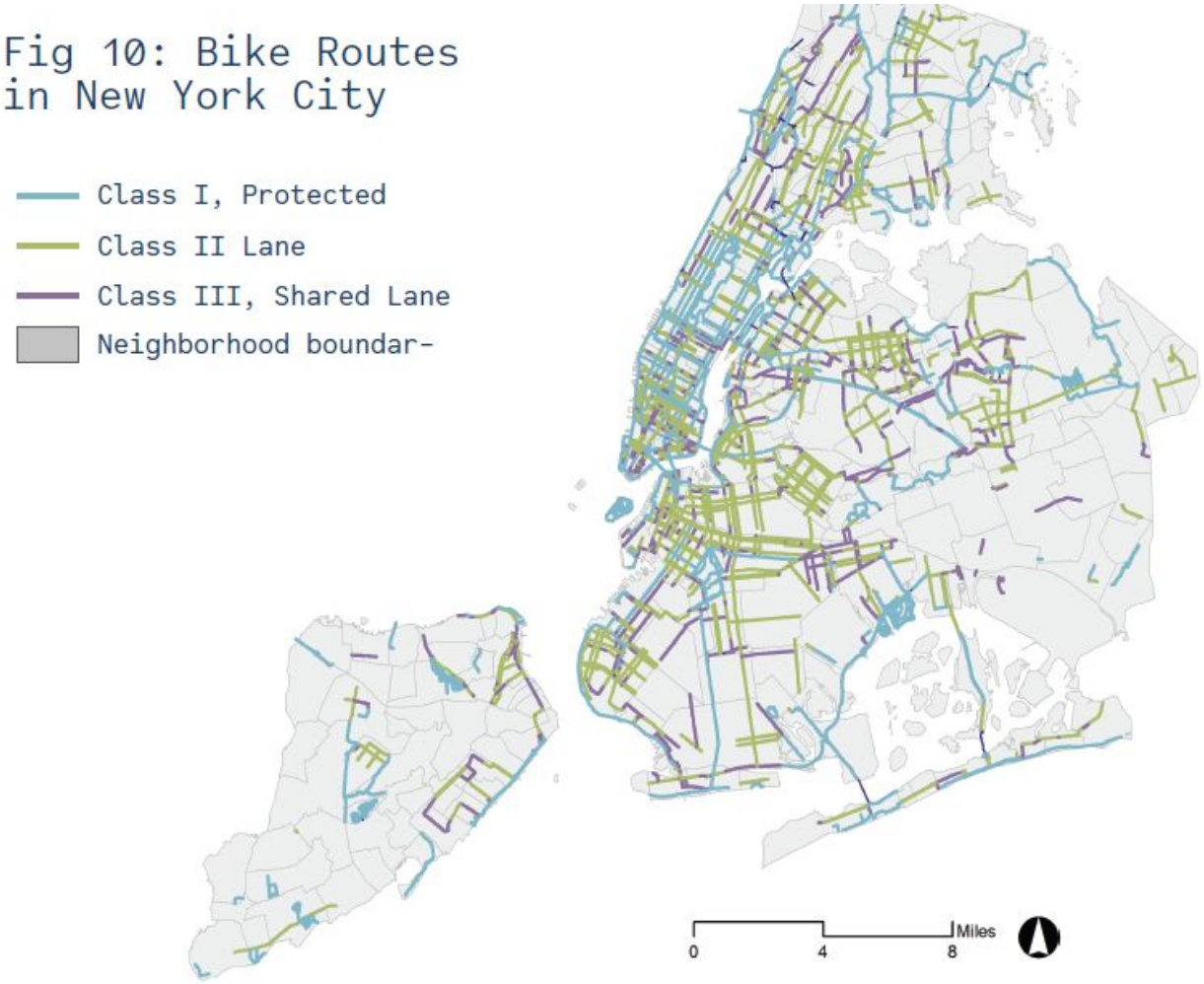
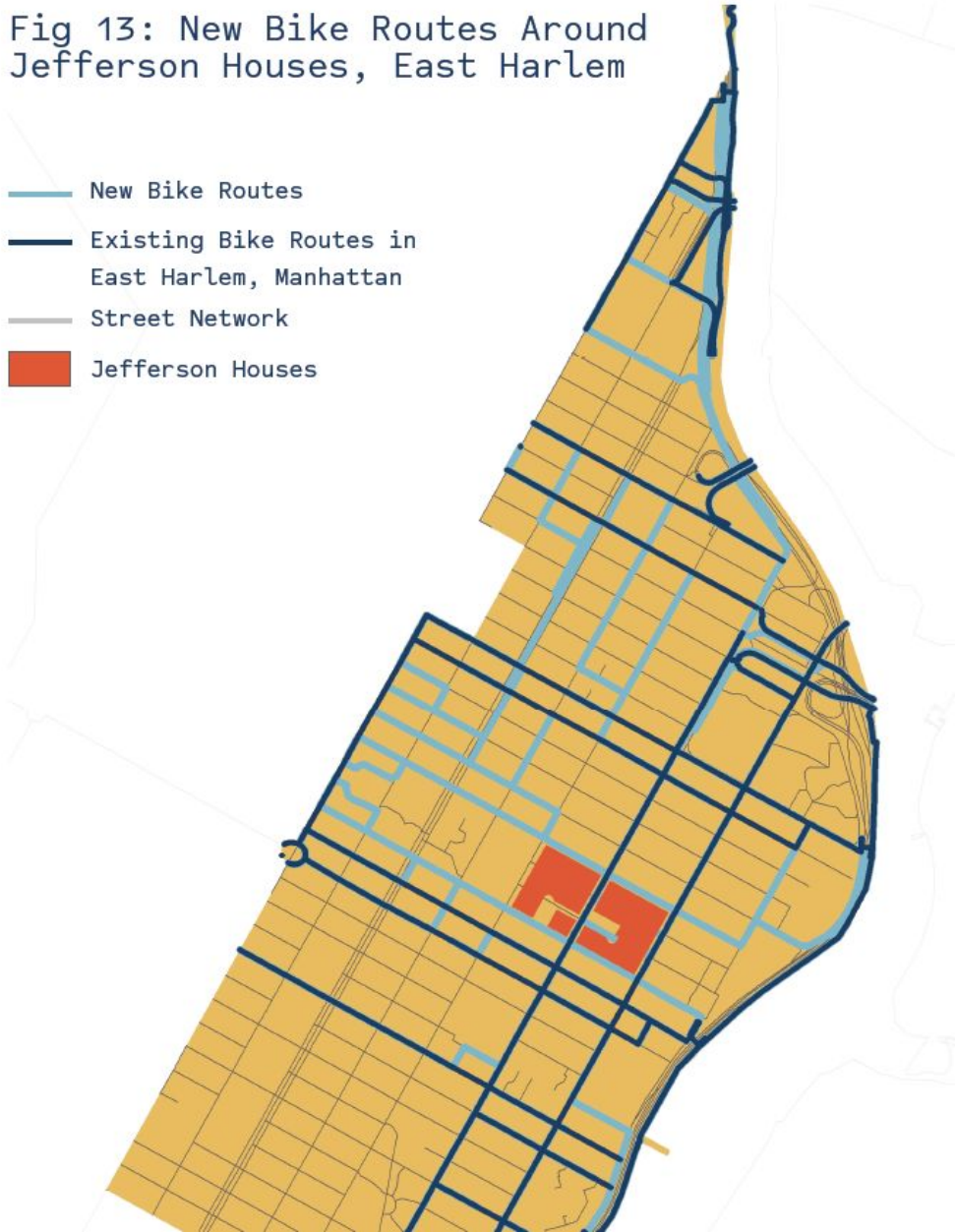


Fig 13: New Bike Routes Around Jefferson Houses, East Harlem



1- NYC DOT Bike Routes (NYC Open Data)
2- Source NYC DOT Bike Routes, NYC DCP LION Streets, NYCHA Developments

CLOUDBURST FLOODING MITIGATION

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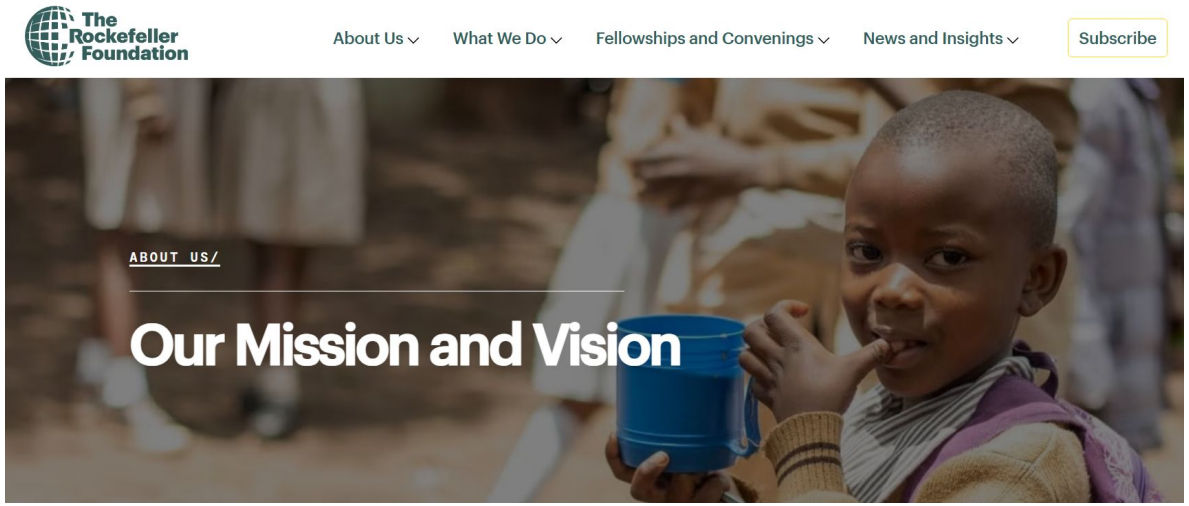
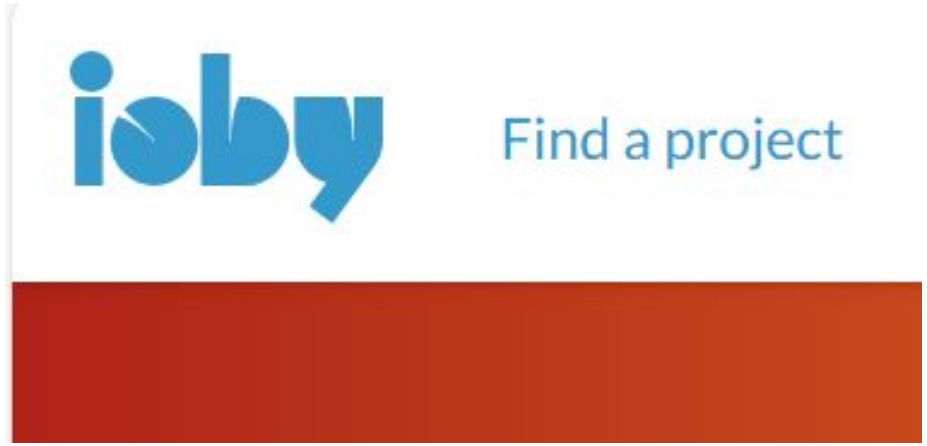
HOW TO FUND THOSE IMPROVEMENTS?

NYC Department of Environmental Protection : up to $500,000 grant

The Rockefeller Foundation: up to $1,000,000 grant





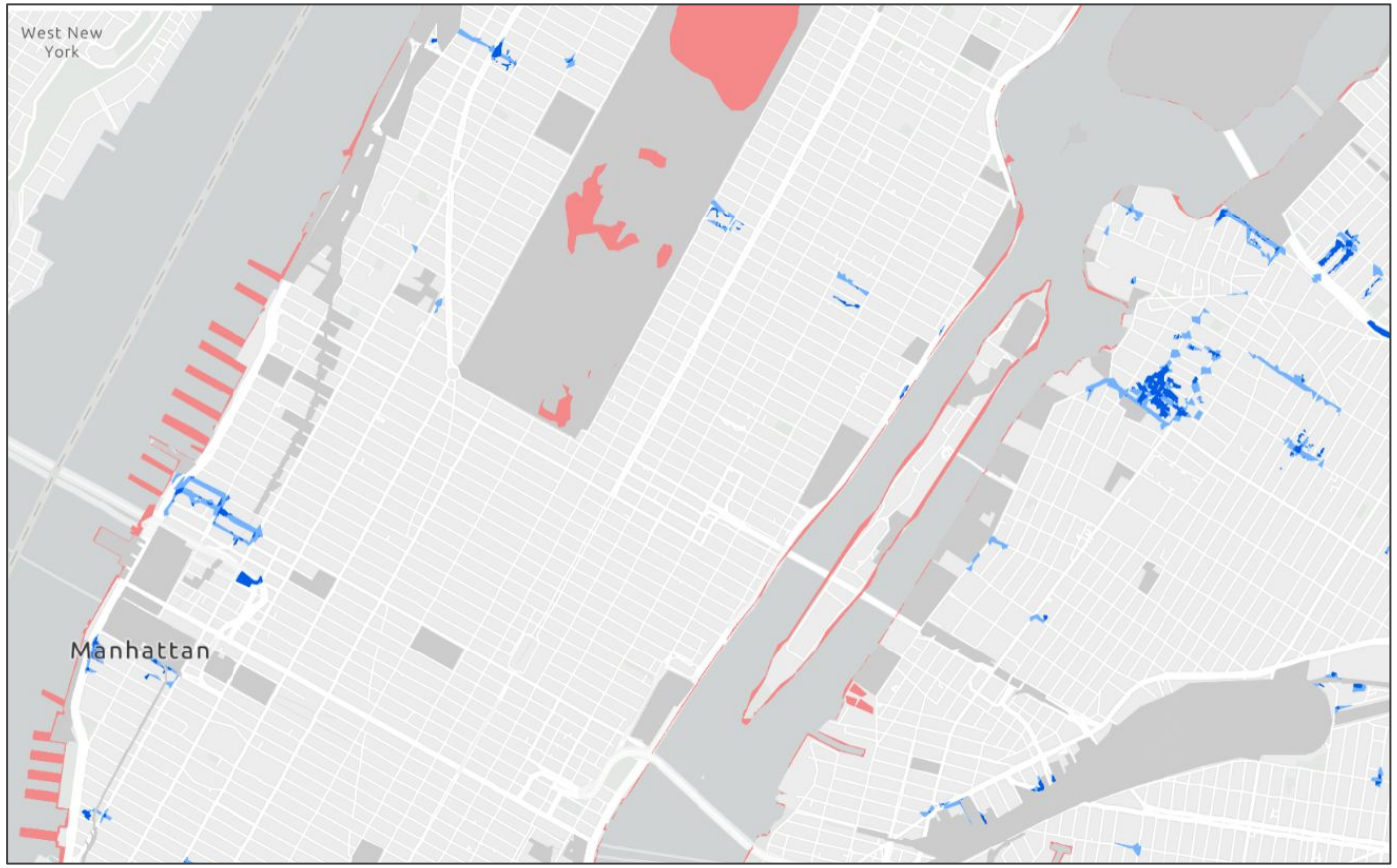
ioby (in your backyard) : crowdfunding

1- NYC DEP
2- The Rockefeller Foundation
3-2021 Con Edison Power Up Neighborhood Match - ioby

Key Actions NYC Should Be Doing

Establish Cloudburst Priority Districts

- Hotspots clearly identified (Astoria 31st Dr, Midtown West 42nd St)
- No formal cloudburst priority zones exist
- Prioritizing these areas improves efficiency and equity



Key Actions NYC Should Be Doing

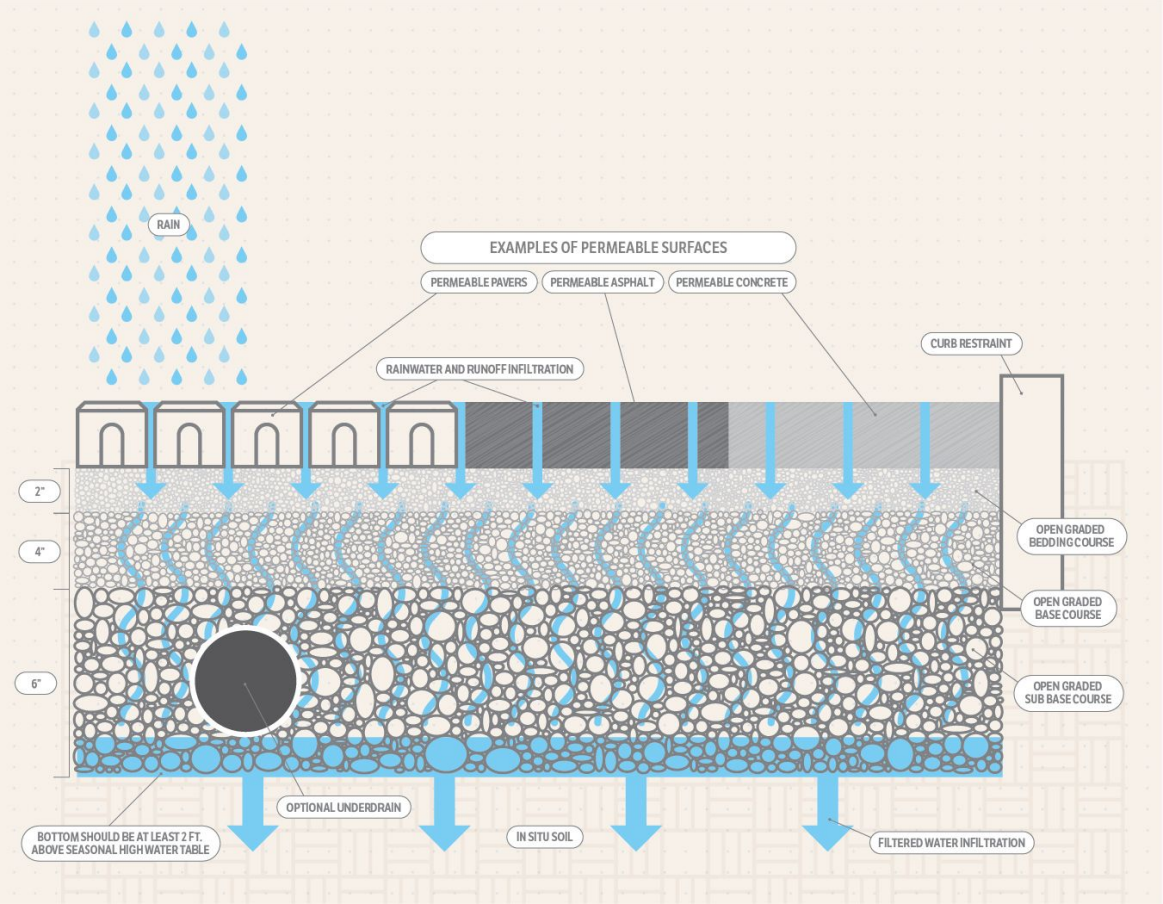
Implement Pre-Storm Preventive Maintenance

- Blocked drains worsened flooding in the Oct 30 event
- No targeted pre-storm grate cleaning protocol
- Low-cost measure with significant impact

Key Actions NYC Should Be Doing

Mandate Integrated Green–Gray Design

- Absorb–Store–Transfer framework not required in NYC capital projects
- Need combined green + gray solutions
- Examples: permeable pavements, detention space, upgraded inlets



Corona Cloudburst Hub: Recommendation 1

Add a ***Basement Risk Layer*** to the Hub design

Map:

- known basement units
- Ida fatality locations
- 311 sewer back-up and ponding complaints

Next Steps:

(hydrologists & civil engineers)

Simulate how water **enters** people's homes

Engineers should test:

- Drains at upstream ends of basement streets
- Infiltration strips in front of below-grade homes
- Regrading sidewalks that slope into houses

Window wells

Areaway stairs

(architects & urban designers)

- Areaway stair canopies to prevent direct rainfall inflow
- Continuous rain gardens running the length of the block to intercept surface runoff
- Small plaza depressions that temporarily store runoff

Corona Cloudburst Hub: Recommendation 2

Issue Observed	Corona Cloudburst Hub Initiative	Additional Recommendation
Street flooding in low-lying roads	Blue-green corridors guide water to detention areas	Use 311 flooding reports to target new infiltration zones
Blocked storm drains	Permeable pavement + targeted drainage	Add a pre-storm leaf-cleaning program each fall
Runoff reaches drains too quickly	Porous panels slow and store runoff	Track water retention during storms to test performance
Sewers exceeded capacity	*ABSORB → STORE → TRANSFER* strategy: subsurface detention tanks near NY Hall of Science	Model for 2.5–3 in/hr events to size future tanks

Clean Water State Revolving Fund

2024 Highlights:

- $9.4 Billion assistance provided across the country
- Range of Loan Sizes: 8.7K to $260M

CWSRF-Eligible Initiatives: (qualify as large-scale stormwater retention structures)

- Full-block right-of-way green infrastructure (GI)
- Permeable bus lanes / parking lanes
- Replace impervious surfaces with porous asphalt/concrete