

A photograph of a garden bed. The foreground and middle ground are filled with dark brown mulch and several green, leafy plants. A concrete curb runs along the right side of the bed. In the background, there is a gravel area and more greenery. A white rectangular box with a thin blue border is superimposed over the center of the image, containing the title text.

# UNDERSTANDING THE CAPACITY FOR GREEN INFRASTRUCTURE IN THE MASPETH IBZ

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# AGENDA

INTRODUCTION

EXISTING POLICIES

RESEARCH QUESTION

METHODS & MATERIALS

RESULTS & DISCUSSION

CONCLUSION

REFERENCES







## INTRODUCTION

### THE URBAN HEAT ISLAND EFFECT

The urban heat island (UHI) effect arises from the high concentration of concrete and other heat retaining materials in urban environments. The lack of soil and green space, which can retain water to cool surrounding areas, combined with the layout of the city amplifies the UHI effect, which can cause health-related issues as high temperatures linger longer during extreme heat events.

### IN INDUSTRIAL BUSINESS ZONES

Industrial business zones (IBZs) were established in 2006 to protect existing manufacturing districts. The UHI effect can be seen in full force in these zones due to the higher levels of anthropogenic heat generation from industry and vehicular emissions as well as the lack of green infrastructure and canopy cover.



## GI IN AN IBZ

There are a variety of challenges that come with trying to add GI in an IBZ:

- Unconventional street layouts and use make the installation of bioswales and planting of trees, which are typically designed to city standards, difficult
- Businesses are concerned about liability
- High upfront costs and takes up a lot of space
- Hard to pitch for health benefits because of lack of residents in IBZs





## EXISTING GI POLICY

- DEP Bioswales
- NYC Incentives for Green Infrastructure
  - NYC Green Roof Abatement Program + LL 92, 94
  - Green Infrastructure Grant





# RESEARCH

## RESEARCH QUESTION

How can efforts to implement GI in IBZs most effectively complement the interests of the businesses in the area?

### Green Roof Focus?

- Insulative properties can be beneficial from cost standpoint
- Less intrusive in terms of sidewalk space
- Maspeth IBZ has very large lot sizes

## EXISTING CONDITIONS

- Identify and categorize the businesses existing in the IBZ
- Sort lots based on potential for GI

## POLICY: PAST AND PRESENT

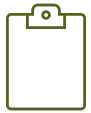
- Success of solar panel incentives
- LL 97 current rollout
- Extreme heat and GI going forward

## TARGET RESPONDENTS

- Workers
- Business Owners
- Property Owners



# TOOLS



## GOOGLE FORMS

To create and distribute questionnaires



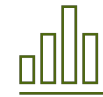
## GOOGLE EARTH/MAPS

To locate and identify businesses



## GIS

To gather and plot geospatial information on locations in the IBZ



## EXCEL/SHEETS

To collate and sort lot sizes, locations, and emails





# METHODOLOGY

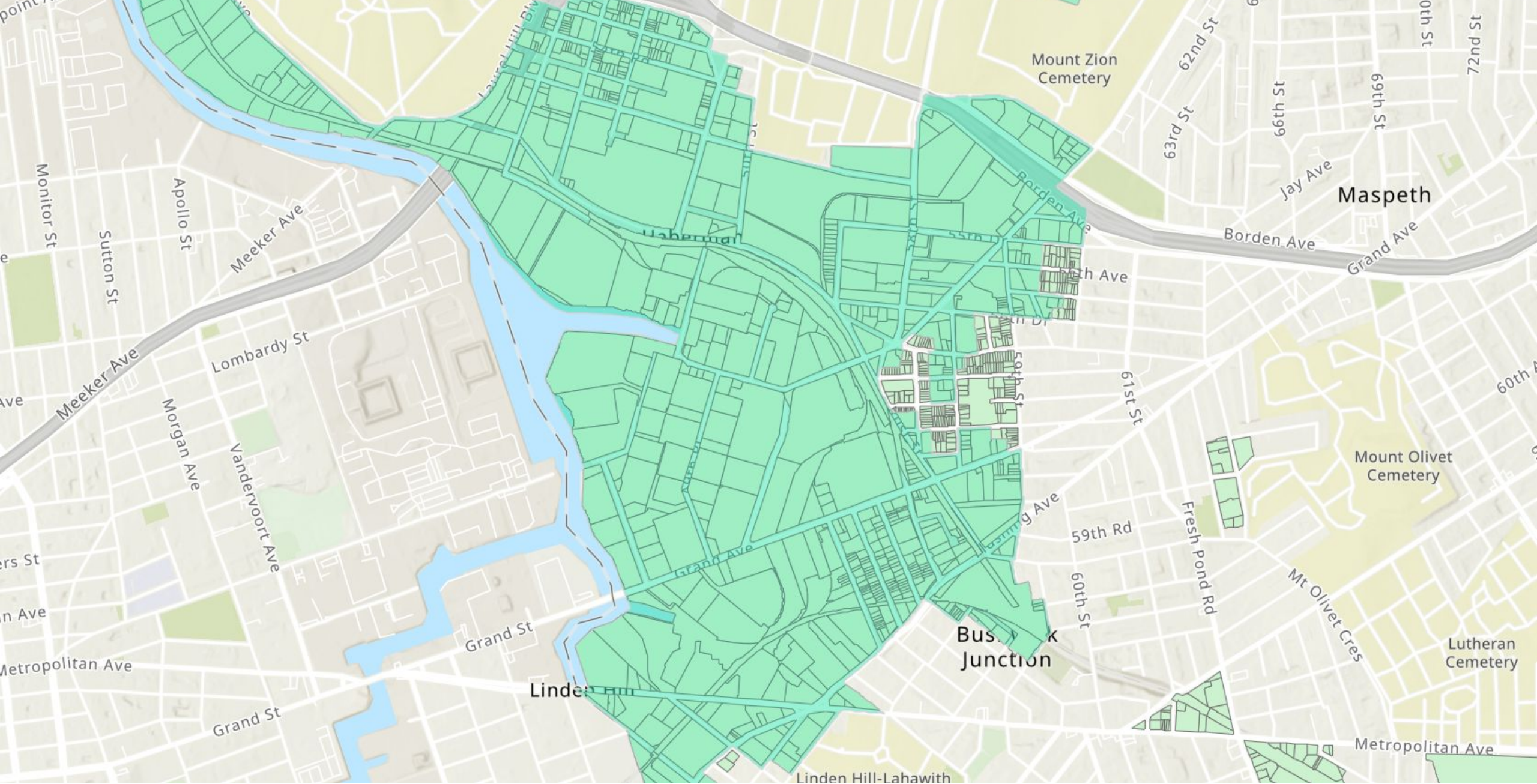
## POLICY REVIEW

- Identify and review based on keywords [UHI], [extreme heat]
- Isolate mentions of [GI]
- Compare with PV and energy

## SORTING LAND USE

- Obtain tax lot data from MAPPLUTO
- Overlay with IBZ map to filter out Maspeth results for data extraction to Excel
- Sort and remove streets, parking, lots owned by DOT etc.
- Cross-reference with Google Earth for business names at each lot and existing PV infrastructure
- Roof area based on BldgArea and NumFloor, on FAR and LotArea when BldgArea = 0
- Use refined dataset for PV map and for locations with potential









RESULTS

The image shows a commercial site with a gravel area in the foreground, a concrete foundation, and a building in the background. The word 'RESULTS' is overlaid in large green letters. The building has a sign that says 'LUMBER' and another that says 'SELF ST'. A white van is parked on the left, and a silver car is parked on the right. A green rectangular box highlights the word 'RESULTS'.



# FACTORS TO CONSIDER FOR A GR

## USE

- Building use
- Ownership
- Multiple stakeholders

## SPECS

- Height
- Building Age
- Structure type

## ROOF

- Existing infrastructure
- Area
- Depth







## LOCATIONS

### BUSINESSES

Able to identify and document 484 businesses on approximately 300 lots  
72 lots with multiple businesses occupying

### INFERRED ROOF AREA

$\text{RoofArea} = \text{BldgArea} / \text{NumFloor}$   
42 with roof area > 50,000 sqft  
100 with roof area > 20,000 sqft

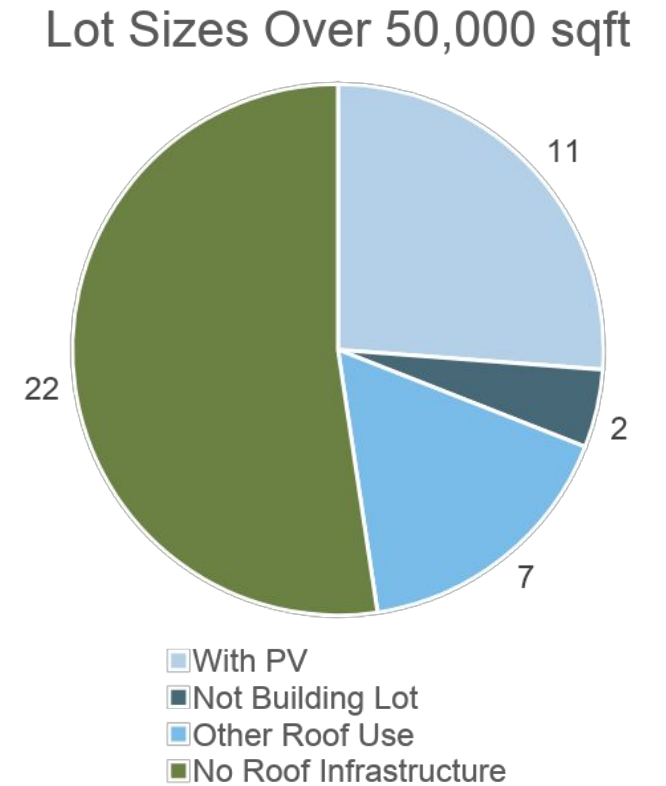
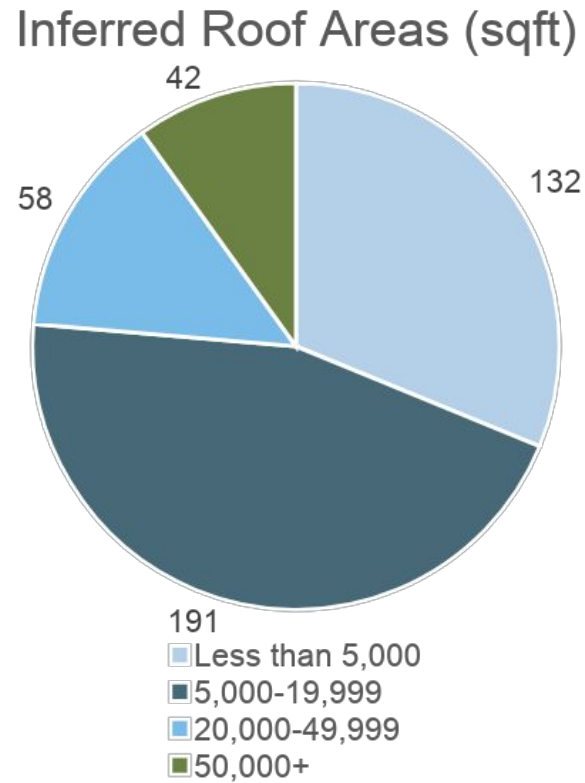
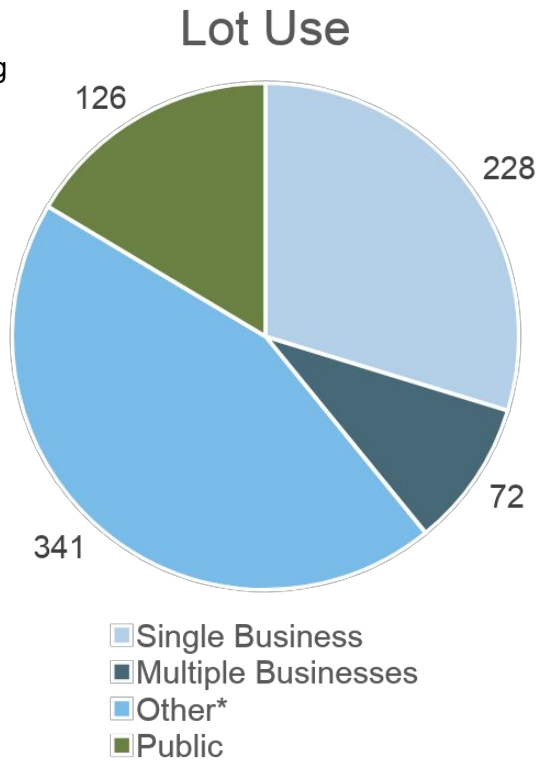
### SOLAR PANEL DISTRIBUTION

Out of the 42 buildings with roof area over 50,000 sqft, 11 have existing PV installations



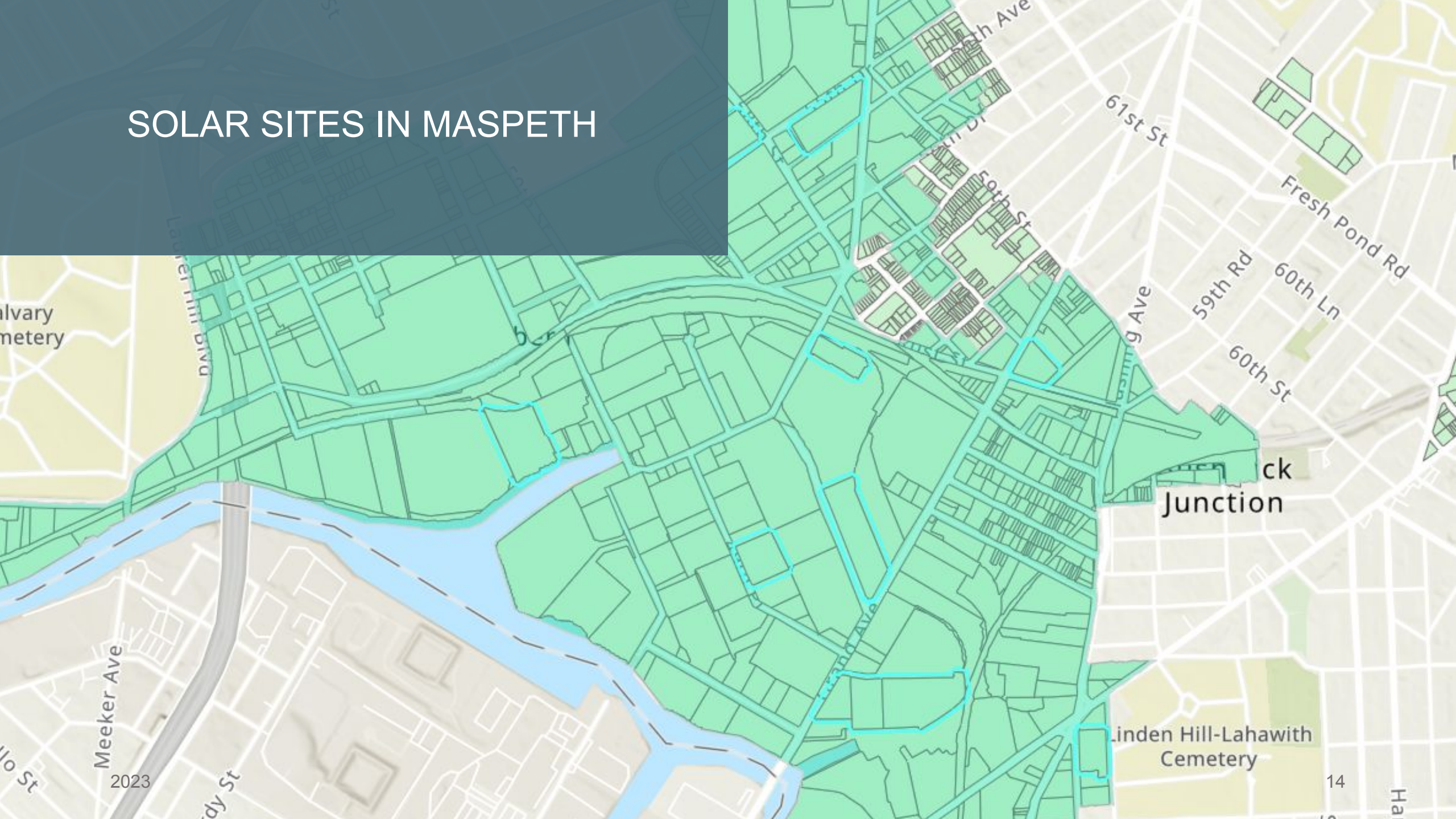
# BUILDING DATA VISUALIZED

\*Other uses include parking lots, residential, non-building lots, ongoing construction etc.

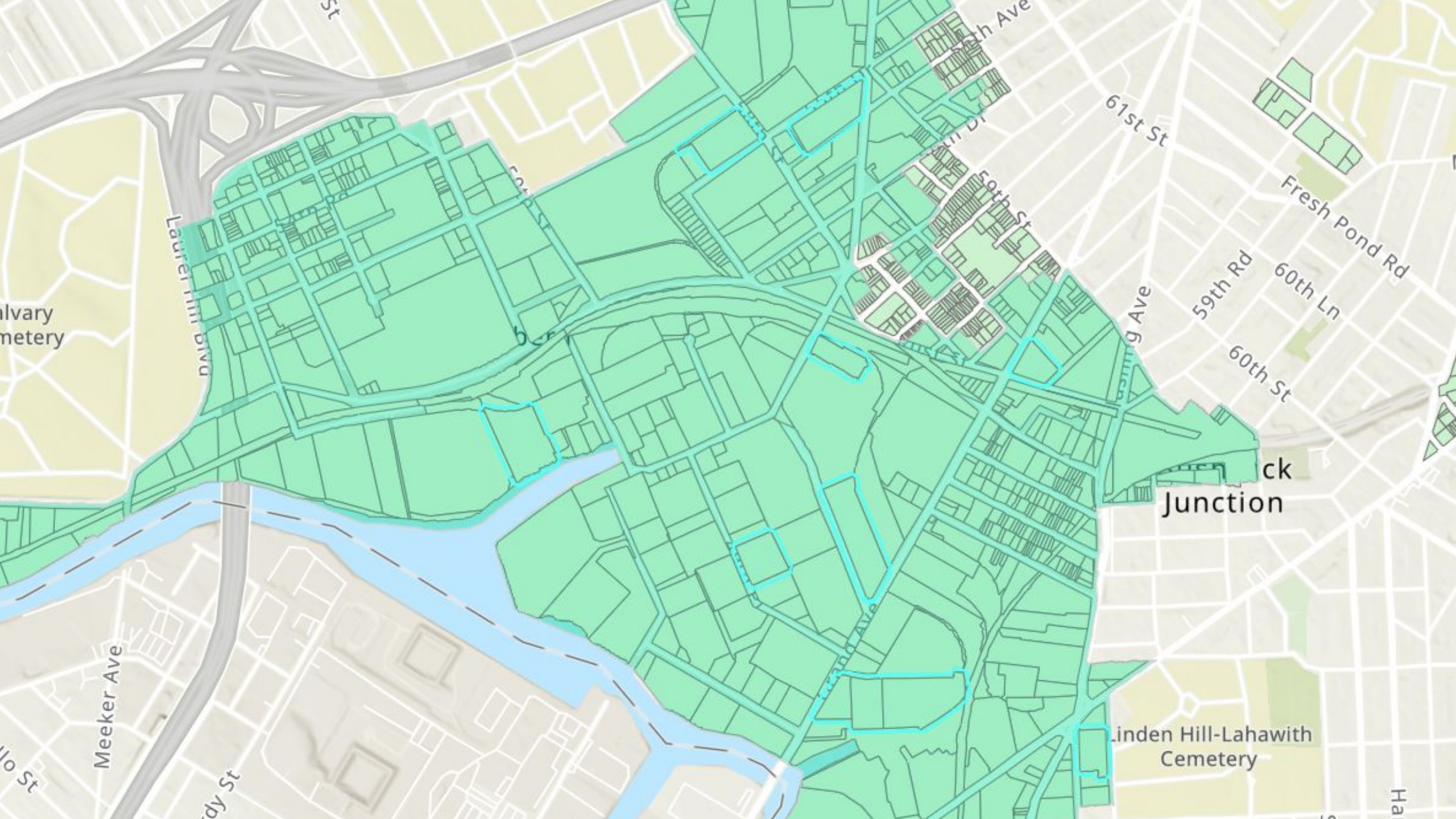




# SOLAR SITES IN MASPETH







Alvary  
emetery

Laurel Hill Blvd

Meeker Ave

10 St

dy St

60th St

61st Ave

61st St

60th St

60th St

60th St

60th St

60th St

60th St

60th St

60th St

61st St

59th Rd

60th Ln

60th St

Fresh Pond Rd

ck  
Junction

Linden Hill-Lahawith  
Cemetery

Ha



## SOURCES OF ERROR

### HUMAN ERROR

- Miscounts
- Accidentally skipping a line

### FUTURE CHANGES

- Planned installations or construction unknown
- Future of real estate market

### SMALLER BUSINESSES

- Smaller businesses without online presence or obvious signage left unaccounted for
- Only managed to identify ~60% of 850+ businesses

### UNUSUAL LOT CONDITIONS

- More than one lot per building
- Incomplete lot addresses
- Roof area difficulties

RUST STREET	M1-1	
54-01 FLUSHING AVENUE	M1-1	
55 STREET	M1-1	2
56 STREET	M1-1	
FLUSHING AVENUE	M1-1	

Example of entries with incomplete addresses



# LEARNING FROM THE PAST

	Programs	Communications	Resources	Goal
Solar	<ul style="list-style-type: none"> <li>• NYC Tax Abatement</li> <li>• NY Sun Incentive (Commercial)</li> <li>• Solar Rebates</li> </ul>	<ul style="list-style-type: none"> <li>• Advertisements</li> <li>• Selling back to energy grid</li> <li>• Can be arranged with your energy company</li> </ul>	<ul style="list-style-type: none"> <li>• Rooftop suitability maps</li> <li>• Online cost calculators</li> </ul>	Aid in achieving renewable energy grid by 2050; 1,000 MW by 2030
Energy and CO2 Emissions	<ul style="list-style-type: none"> <li>• LL 33 and 97</li> <li>• Retrofit accelerator, CIEE, NYSDERA programs</li> </ul>	<ul style="list-style-type: none"> <li>• Establishment of carbon coefficients</li> <li>• Education efforts informing on options (REC, incentives)</li> </ul>	<ul style="list-style-type: none"> <li>• Emissions calculator</li> <li>• Guides from NYC Accelerator</li> <li>• EnergyStar</li> </ul>	Reduce emissions by 40% by 2030, 80% by 2050
What can we learn for addressing UHI?	Variety of state and city programs	Emphasize clarity and establish a clear metric	Prioritize accessibility	Set tangible goals



# CONCLUSIONS AND FUTURE STUDY

## High Physical Potential

- Large number of lots over 5000 sqft
- At least half of lots over 50,000 sqft have roof potential

## Need For Communication

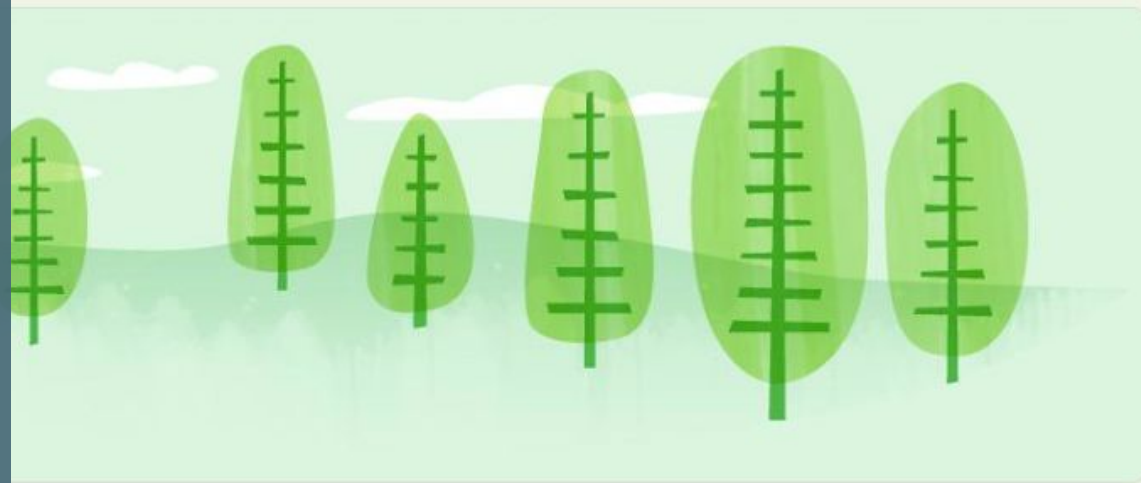
- Difficult to exactly quantify the cost benefits of GI
- Business interests and land ownership add additional complications

## Use For Information

- Gathered contact information can be used for future outreach
- Data can be further analyzed using building age, materials etc.







# Urban Heat Island Effect Questionnaire

## Lessons from attempted surveys

- Question formulation for general public
- Few people are walking around in the IBZ outside of working hours for street-level questions
- Phone numbers more readily available than emails

SURVEY



## REFERENCES

Reference Maps: MAPPLUTO, NYC Industrial Business Zones

<https://www.nyc.gov/site/dep/water/green-infrastructure-grant-program.page>

<https://pfnyc.org/wp-content/uploads/2022/03/A-Guide-to-Green-Infrastructure-Funding-March-2022.pdf>

[https://static1.squarespace.com/static/58e3eecf2994ca997dd56381/t/5d84dfc371cf0822bdf7dc29/1568989140101/Green\\_Roof\\_and\\_Wall\\_Policy\\_in\\_North\\_America.pdf](https://static1.squarespace.com/static/58e3eecf2994ca997dd56381/t/5d84dfc371cf0822bdf7dc29/1568989140101/Green_Roof_and_Wall_Policy_in_North_America.pdf)

<https://efc.ny.gov/system/files/documents/2023/05/2023-gigp-rfa-final.pdf>

<https://guarinicenter.org/wp-content/uploads/2019/03/A-Review-of-Green-Roof-Laws-Policies.pdf>

<https://www.swimmablenyc.org/green-roof-tax-abatement-timeline>

<https://www.mibanyc.org/maspeth-ibz>



THANK YOU





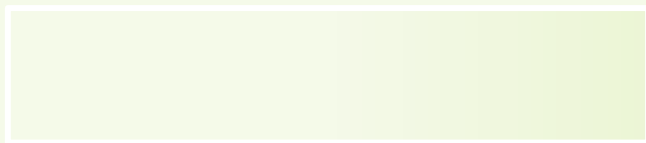
HIGH PHYSICAL  
POTENTIAL

NEED FOR  
COMMUNICATION

CLOSER LOOK AT  
SITE CONDITIONS

USE CONTACT  
INFORMATION





## CURRENT PLANS TO DEAL WITH EXTREME HEAT

## ROOM FOR GI

## HISTORY, GI INCENTIVES

- LL 97 (case study, streams of communication, knowledge sharing, Lessons to take away from)
- Energy grid
- State + City goals (extreme heat, GI)