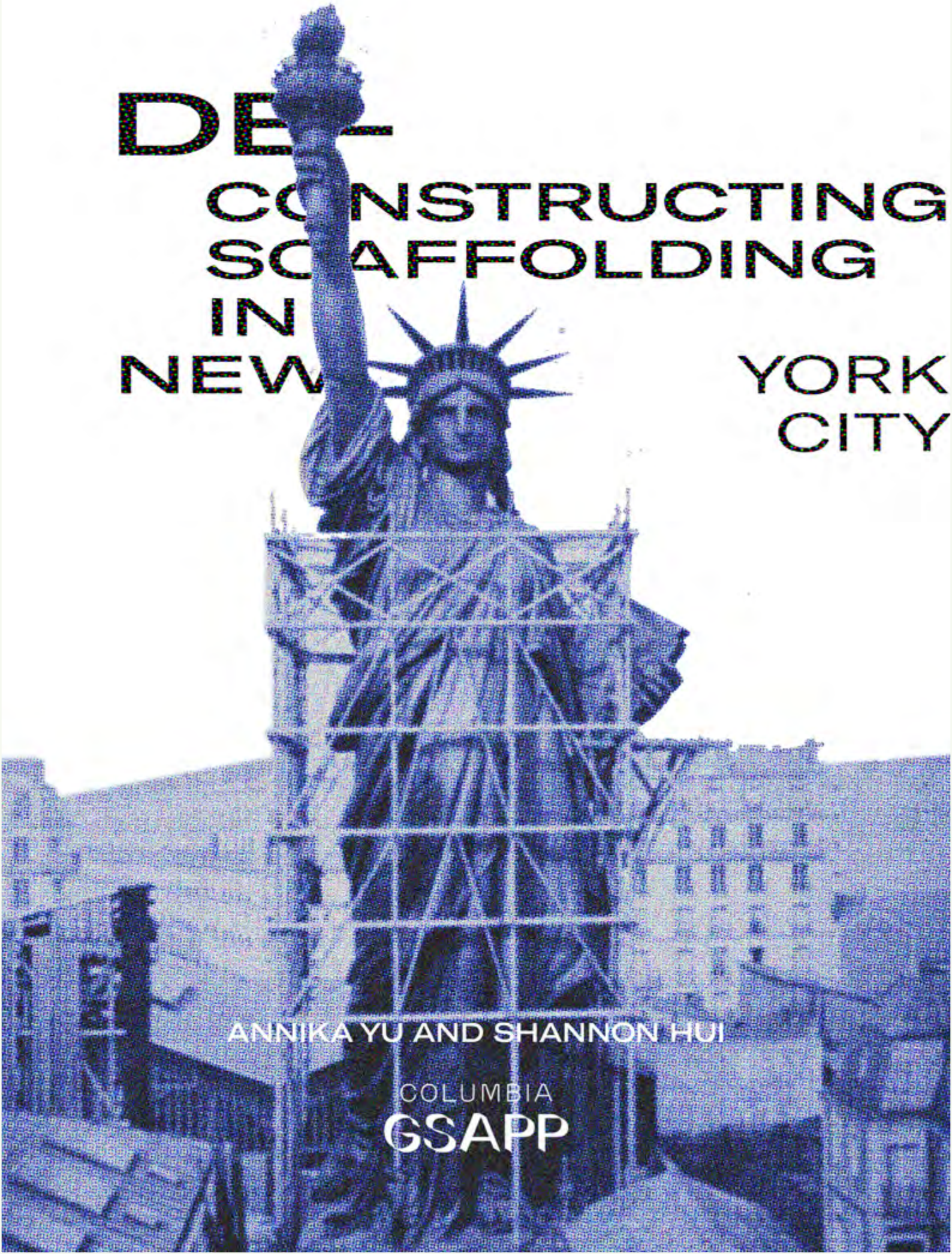
DE-CONSTRUCTING SCAFFOLDING IN NEW YORK CITY



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ACKNOWLEDGEMENTS

We would like to express our sincerest gratitude to Professors Leah Meisterlin and Daniel Froehlich for their relentless patience and guidance in the creation of this work. Without their wisdom and creativity, this effort would have been impossible, and our curiosity and passion towards the enigma of New York's scaffolding would remain unpursued. We are also grateful to Mario Giampieri for his unique insight on approaching duplicates in our dataset on active sheds!

STATEMENT OF INTENT

We, Annika and Shannon, approach this initative as first-year Urban Planning students of an introductory Geographic Information Systems course at Columbia University, GSAPP. Though we intend to provide the most transparent and honest documentation of our process, in addition to the most accurate representation of the scaffolding landscape in New York City, we acknowledge the potential for having overlooked geoprocessing errors and alternative interpretations of our results. The disparate experiences of sidewalks across Manhattan necessitates a contextualized understanding of local conditions. Our hope is to provide a spatial-statistical analysis of scaffolding to facilitate the advocacy and political discourse surrounding public streetscapes at the neighborhood scale.

The built environment of New York City is characterized by its scaffolding– a seemingly permanent and omnipresent architecture that articulates the streetscape and pedestrian experience. The symbolism of scaffolding is in the eye of the beholder– often drawing contrasting sentiments. For some, scaffolding provides a safe haven from inclement weather, temporary shelter for the houseless, makeshift gymnasium, or a public canvas on which art is shared. For others, the structure represents the unfinished, perhaps hazardous underpasses that would much rather be avoided.

Scaffolding in the city of New York has rich historical legacies. In 1979 a Barnard College Freshman died as a result of falling debris from a building on Broadway and 111th. This prompted the emergence of facade inspection laws that persist to this day. (Varone, 2015) The Facade Inspection Safety Program (FISP), also known as Local Law 11, mandates the regulation of facade inspections and repairs for buildings taller than six stories every five years. (Akam, 2020) This, on top of the numerous construction and development projects makes for a city with more scaffolding than any other. In Manhattan alone, there is on average, over 300 miles of scaffolding at any given moment.

The pervasiveness of scaffolding has been scrutinized by government officials and sidewalk advocates alike. The problem at hand: there is lack of enforcement to ensure that scaffolding is removed in a timely fashion upon the completion of maintenance or construction projects, resulting in persistent scaffolds across the city that can remain erect for as long as two decades.(Saltonstall, 2022) Sidewalk advocates claim that scaffolding threatens the quality of life for residents, blocking light, invading privacy, even posing higher risks of crime. (Brosnan, 2021)

In 2019, the Department of Buildings increased enforcement of scaffolding removal, bringing civil and criminal nuisance abatement cases against building users.

> “Sidewalk sheds are a critical tool for protecting the public against the dangers of falling debris,” Andrew Rudansky, a spokesperson for the Department of Buildings, said in a statement. “However, these same sheds can also be a nuisance when building owners let repair work languish, keeping their sheds up far longer than necessary. In recent years we’ve strengthened our enforcement protocols, increased fines, and are taking aggressive action in court to compel these owners to make the needed repairs to their buildings, so that these sheds can be taken down, returning valuable street space to New Yorkers.”

Many have argued that the fine is too small and too loosely enforced to enact any real change.

HOW DOES LOCAL LAW 11 WORK?

Local Law 11, an update of the original inspection law, says a licensed architect or engineer must carry out a building's inspection and send a report to the city's Department of Buildings. Any deficiencies found by the inspector (such as cracked bricks or masonry, or loose metal anchors) are supposed to be corrected within 90 days. But the law allows for multiple time extensions.

In Manhattan, about a third of sheds fall under the category of Local Law 11 according to DOB. Though the mandate provides a rather flexible time table, the main priority is safety. In many cases, if the damage has not been addressed within the given time frame, the city allows scaffolding to remain in place for a fine– sometimes even for decades.

WHAT'S BEING DONE?

In 2016, then-District 5 City Council member Ben Kallos raised a proposal that extended the maintenance time frame to 180 days instead of the previous 90 days. After that, maintenance would automatically be undertaken by the city and billed to the building owner.

In most cases, this puts finances at the forefront of the fight to remove unwanted scaffolding. Building owners often don't have the up-front costs to finance scaffolding and would therefore rather rely on smaller, incremental payments for protection, even if that meant retaining a stretch of scaffolding. The West Park Presbyterian Church,

for example, has had its scaffolding up for more than 18 years. When asked about the reasons they were unable to take it down, they said that it was because of the dwindling congregation, and therefore dwindling funds.

Since then, innovation to address the scaffolding problem has ranged from new policy, to newer forms of scaffolding altogether. However, with the push towards stricter enforcement of scaffolding removal, the question still remains– where does the burden of scaffolding fall and how would new enforcement provide equitable solutions to the sidewalk experience.

Thus, there an opportunity to deploy spatial-statistical analyses in evaluating the extent to which long-standing scaffolding in Manhattan are truly outliers, as claimed when studying the scaffolding landscape at the city-scale, or rather the norm experienced by certain demographic and land-use characteristics at the neighborhood-level. The goal of this study is to identify how the placement, coverage, and duration of scaffolding erection varies amongst neighborhoods in Manhattan, and how those differences are an indicator of greater neighborhood conditions– specifically, median household income and commercial land use.

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RESEARCH QUESTIONS

We want to methodologically explore the correlation between the prevalence of scaffolding, the rate of new development, and frequency of maintenance by mapping the following key questions–

1. What is the spatial distribution of long-standing scaffolding (versus others) across Manhattan in 2022?

1a. What is the proportion of sidewalk-to-active scaffolding within each census block?

1b. Where are the clusters of low and high proportions of sidewalk-to-active scaffolding across Manhattan?

1c. What is the age of the longest-standing active scaffolding within each census block?

1d. Where are the clusters of longstanding and shortstanding scaffolding across Manhattan?

2. How does the landscape of scaffolding compare with the spatial distribution of American Community Survey (2020) demographic characteristics?

2a. What is the median household income within each Manhattan census block in 2022?

2b. Where are the clusters of low and high median household income across Manhattan?

2c. Where do the clusters of low and high median household income intersect with clusters of low and high sidewalk-to-active scaffolding proportion?

2d. Where do the clusters of low and high median household income intersect with clusters of longstanding and shortstanding scaffolding?

3. How does the landscape of scaffolding compare with the spatial distribution of Primary Land Use Tax Lot Output (PLUTO) commercial land use (2020)?

3a. What is the proportion of commercial lot area to total census block area, as defined by building use class, within each census block?

3b. Where are the clusters of low and high proportions of commercial lot area to total census block area across Manhattan?

3c. Where do the clusters of low and high proportions of commercial lot-to-census block area intersect with clusters of low and high sidewalk-to-active scaffolding proportion?

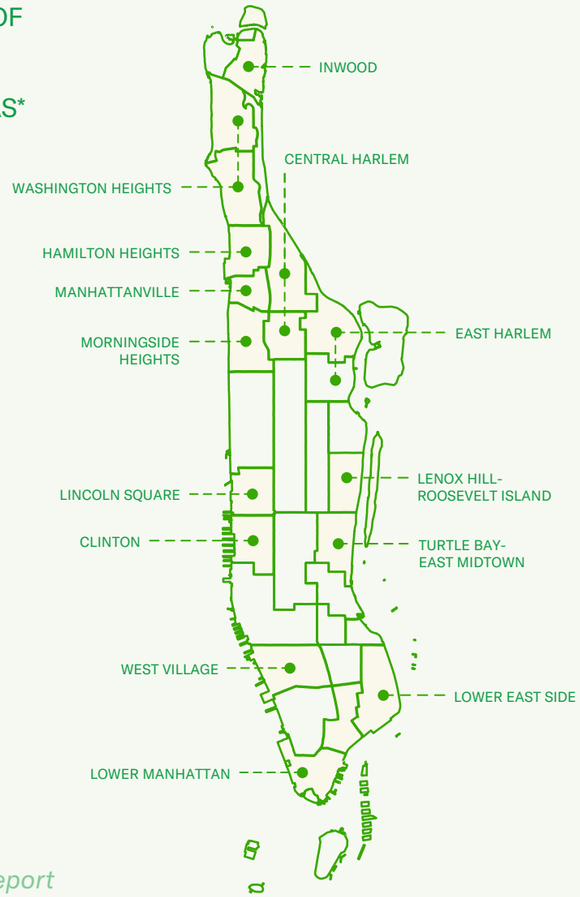
3d. Where do the clusters of low and high proportions of commercial lot-to-census block area intersect with clusters of longstanding and shortstanding scaffolding?

SCOPE

The geographic scope of this study will be defined as the Manhattan borough of New York City, given its socioeconomic diversity and notoriety for its widespread prevalence of scaffolded construction.

The temporal scope is limited to a representation of the actively-erected scaffolding landscape in June 17, 2022, with income and land-use data representative of 2020 conditions.

REFERENCE MAP OF MANHATTAN'S NEIGHBORHOOD TABULATION AREAS*



Limited to those referenced in this report

HYPOTHESIS

Our hypotheses are three-fold–

1. We anticipate seeing density clusters of scaffolding in both low-income residential and high-income commercial neighborhoods.

2. However, neighborhoods with higher-concentrated clusters of lower-income households may have more persistent scaffolding erection, signaling a lack of repair and maintenance investment.

3. Finally, in our exploration of land-use, we expect to see density clustering of scaffolding concentrated in commercial areas, but also erected for shorter periods of time (signaling rapid development, as well as higher levels of investment in sidewalk management by ground-level storefront business owners).

Though we seek to address concerns of socioeconomic inequalities manifested through scaffolding, we anticipate the possibility that the limitations in our study may allude to a higher correlation between scaffolding and commercial land use rather than median household income.

OPERATIONALIZING TERMS

SCAFFOLDING
As measured by entries within the *Active Sidewalk Shed Permits* dataset, produced by the New York City Department of Buildings.

HIGH PROPORTION SCAFFOLDING COVERAGE
Upon a Getis-Ord GI* Cluster Test Analysis of proportion of scaffolding length to sidewalk length, measured as a hot spot with 90% confidence and over.

LOW PROPORTION SCAFFOLDING COVERAGE
Upon a Getis-Ord GI* Cluster Test Analysis of proportion of scaffolding length to sidewalk length, measured as a cold spot with 90% confidence and over.

LONG-STANDING SCAFFOLDING
Upon a Getis-Ord GI* Cluster Test Analysis of the oldest scaffold age per census block, measured as a hot spot with 90% confidence and over.

SHORT-STANDING SCAFFOLDING
Upon a Getis-Ord GI* Cluster Test Analysis of the oldest scaffold age per census block, measured as a cold spot with 90% confidence and over.

HIGH MEDIAN HOUSEHOLD INCOME
Upon a Getis-Ord GI* Cluster Test Analysis of median household income per census block, measured as a hot spot with 90% confidence and over.

LOW MEDIAN HOUSEHOLD INCOME
Upon a Getis-Ord GI* Cluster Test Analysis of median household income per census block, measured as a cold spot with 90% confidence and over.

HIGH PROPORTION COMMERCIAL-LAND USE
Upon a Getis-Ord GI* Cluster Test Analysis of proportion of commercial lot area to total census block area in square feet, measured as a hot spot with 90% confidence and over.

LOW PROPORTION COMMERCIAL-LAND USE
Upon a Getis-Ord GI* Cluster Test Analysis of proportion of commercial lot area to total census block area in square feet, measured as a hot spot with 90% confidence and over.

DATASETS

SCAFFOLDING

1. Active Sidewalk Shed Permits, 2022
New York City (NYC) Department of Buildings

DEMOGRAPHICS

2. American Community Survey 5-Year Estimates, 2016-2020
United States Census Bureau
- Median Household Income (In 2020 Inflation-Adjusted Dollars)

INFRASTRUCTURE AND LAND USE

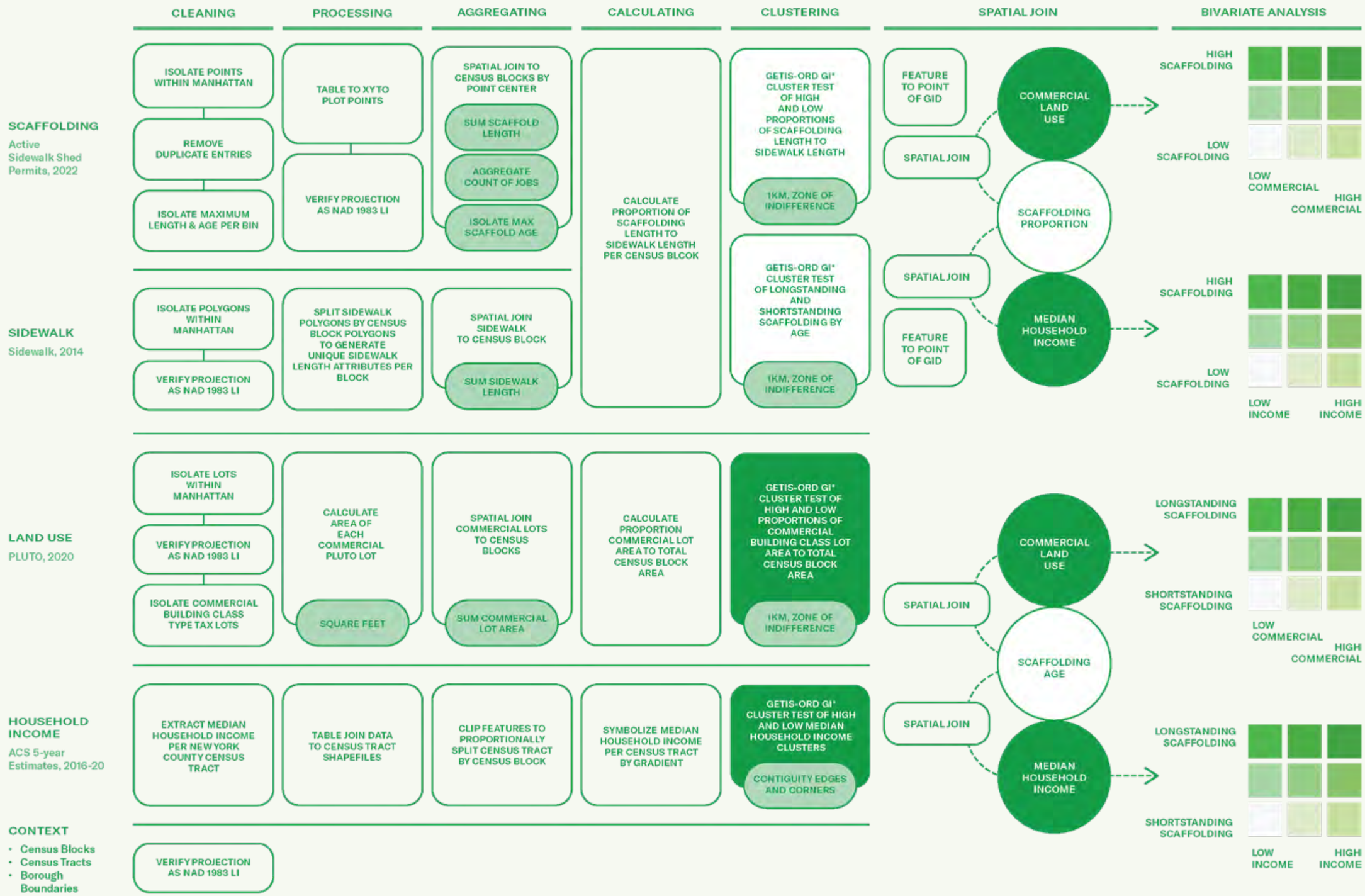
3. Sidewalk, 2014
NYC Office of Technology and Innovation
- Borough_Names_Corrected = Manhattan

4. Primary Land Use Tax Lot Output (PLUTO), 2020
NYC Department of City Planning
- Building Classes relevant to Commercial Use = R5, R7, R8, RA, RB, RH, RK, RC (Mixture of Commercial Types), RM (Mixture of Commercial and Residential), RI (Mixture of Commercial and Industrial)

5. Census Blocks, 2020
NYC Department of City Planning

6. Census Tracts, 2020
NYC Department of City Planning

7. Borough Boundaries, 2013
NYC Department of City Planning
- BoroName = Manhattan


CLEANING
PROCESSING
AGGREGATING
CALCULATING
CLUSTERING
SPATIAL JOIN
BIVARIATE ANALYSIS
SCAFFOLDING
Active Sidewalk Shed Permits, 2022
ISOLATE POINTS WITHIN MANHATTAN
REMOVE DUPLICATE ENTRIES
ISOLATE MAXIMUM LENGTH & AGE PER BIN
TABLE TO XY TO PLOT POINTS
VERIFY PROJECTION AS NAD 1983 LI
SPATIAL JOIN TO CENSUS BLOCKS BY POINT CENTER
SUM SCAFFOLD LENGTH
AGGREGATE COUNT OF JOBS
ISOLATE MAX SCAFFOLD AGE
CALCULATE PROPORTION OF SCAFFOLDING LENGTH TO SIDEWALK LENGTH PER CENSUS BLCOK
GETIS-ORD GI* CLUSTER TEST OF HIGH AND LOW PROPORTIONS OF SCAFFOLDING LENGTH TO SIDEWALK LENGTH
1KM. ZONE OF INDIFFERENCE
GETIS-ORD GI* CLUSTER TEST OF LONGSTANDING AND SHORTSTANDING SCAFFOLDING BY AGE
1KM. ZONE OF INDIFFERENCE
FEATURE TO POINT OF GID
SPATIAL JOIN
SPATIAL JOIN
FEATURE TO POINT OF GID
COMMERCIAL LAND USE
SCAFFOLDING PROPORTION
MEDIAN HOUSEHOLD INCOME
HIGH SCAFFOLDING
LOW SCAFFOLDING
LOW COMMERCIAL
HIGH COMMERCIAL
HIGH SCAFFOLDING
LOW SCAFFOLDING
LOW INCOME
HIGH INCOME
SIDEWALK
Sidewalk, 2014
ISOLATE POLYGONS WITHIN MANHATTAN
VERIFY PROJECTION AS NAD 1983 LI
SPLIT SIDEWALK POLYGONS BY CENSUS BLOCK POLYGONS TO GENERATE UNIQUE SIDEWALK LENGTH ATTRIBUTES PER BLOCK
SPATIAL JOIN SIDEWALK TO CENSUS BLOCK
SUM SIDEWALK LENGTH
LAND USE
PLUTO, 2020
ISOLATE LOTS WITHIN MANHATTAN
VERIFY PROJECTION AS NAD 1983 LI
ISOLATE COMMERCIAL BUILDING CLASS TYPE TAX LOTS
CALCULATE AREA OF EACH COMMERCIAL PLUTO LOT
SQUARE FEET
SPATIAL JOIN COMMERCIAL LOTS TO CENSUS BLOCKS
SUM COMMERCIAL LOT AREA
CALCULATE PROPORTION COMMERCIAL LOT AREA TO TOTAL CENSUS BLOCK AREA
GETIS-ORD GI* CLUSTER TEST OF HIGH AND LOW PROPORTIONS OF COMMERCIAL BUILDING CLASS LOT AREA TO TOTAL CENSUS BLOCK AREA
1KM, ZONE OF INDIFFERENCE
SPATIAL JOIN
SPATIAL JOIN
COMMERCIAL LAND USE
SCAFFOLDING AGE
MEDIAN HOUSEHOLD INCOME
LONGSTANDING SCAFFOLDING
SHORTSTANDING SCAFFOLDING
LOW COMMERCIAL
HIGH COMMERCIAL
LONGSTANDING SCAFFOLDING
SHORTSTANDING SCAFFOLDING
LOW INCOME
HIGH INCOME
HOUSEHOLD INCOME
ACS 5-year Estimates, 2016-20
EXTRACT MEDIAN HOUSEHOLD INCOME PER NEW YORK COUNTY CENSUS TRACT
TABLE JOIN DATA TO CENSUS TRACT SHAPEFILES
CLIP FEATURES TO PROPORTIONALLY SPLIT CENSUS TRACT BY CENSUS BLOCK
SYMBOLIZE MEDIAN HOUSEHOLD INCOME PER CENSUS TRACT BY GRADIENT
GETIS-ORD GI* CLUSTER TEST OF HIGH AND LOW MEDIAN HOUSEHOLD INCOME CLUSTERS
CONTIGUITY EDGES AND CORNERS
CONTEXT
• Census Blocks
• Census Tracts
• Borough Boundaries
VERIFY PROJECTION AS NAD 1983 LI

ASSUMPTIONS

This study relies on several assumptions within its data-processing and methodological design:

- We assume that the width of the scaffold is equivalent to the width of the sidewalk, as defined by the NYC Open Data Sidewalk Dataset, provided by the Office of Technology and Innovation, which we had not verified for accuracy.
- We assume PLUTO lots are cleanly nested within each census block. In term, we spatial joined using the largest shared overlap as a means to approach anomalies.
- We assume that the maximum age and maximum length for each census block is an appropriate means to filter duplicates in the Active Shed dataset
- Marginal inaccuracies in calculating proportion of scaffolding coverage at the census block unit is negligible at the scale of urban policy making and intervention.

LIMITATIONS

DATASETS

- Temporal frame of our study is limited by the scaffolding data available, which is representative of active scaffolds on June 17, 2022, and fails to include scaffolds prior to and after this date.

- Categorization of commercial lots is also limited by PLUTO data, relying on the building classification rather than the commercial floor area.
- Duplicates within the scaffolding data exist in that for multiple within each BIN_IDs, there are multiple inputs, to control for this, we took the maximum age and maximum scaffolding length per bin_id (which is unique for each job).
- The data presents outliers, specifically with regards to scaffolding age and length. Representing maps using aggregates values tends to pull distributions towards the outliers, effectively skewing findings.
- The Active Shed data is plotted as points, which is not representative of the ecological realities of scaffolding which can cross census block boundaries and span multiple directions. Nonetheless, for the simplicity of analysis, we assume that the census block in which the point is nested is where the scaffolding is erected.

DATA PROCESSING

- The ACS' demographic data is provided at the census tract level, whilst our analysis takes place at the census block scale. As a result, we proportionally split the tract data into blocks, implicating the modifiable areal unit problem.

Lenox Hill has a lot of commercial area, and its scaffolding are shortstanding!

RICH LEGACY

Harlem is home to the oldest scaffold in Manhattan, at 5,900 day!

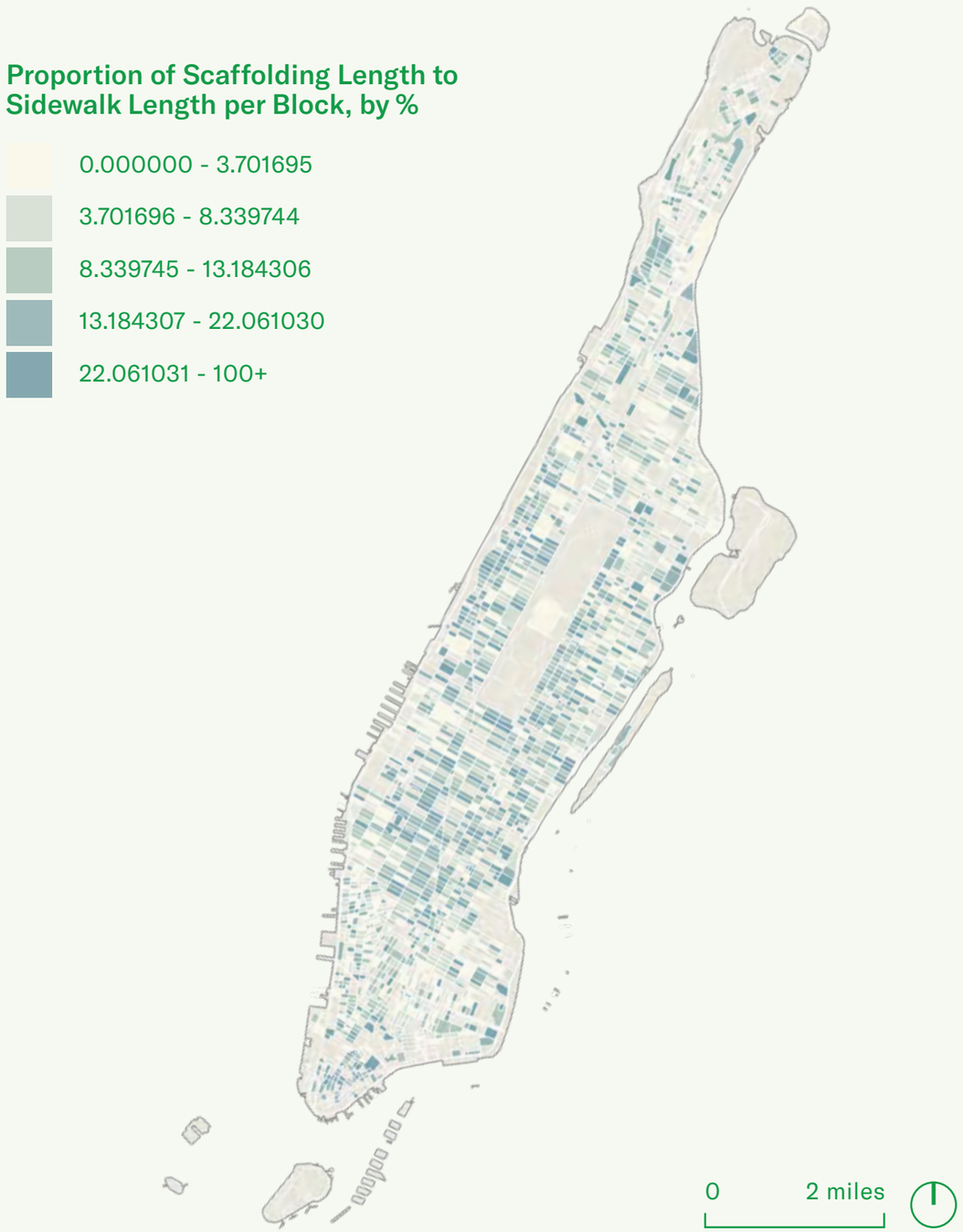
1. What is the spatial distribution of long-standing scaffolding (versus others) across Manhattan in 2022?

UNDER COVER

Midtown East has the strongest cluster of high scaffold-to-sidewalk proportion!

A cluster of longstanding scaffolding is prevalent across Upper West Side, particularly Lincoln Square!

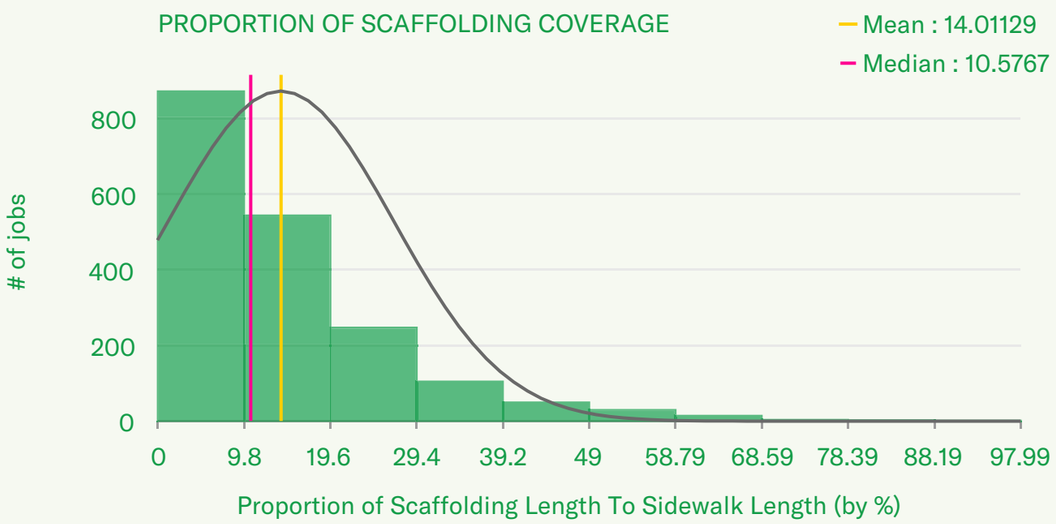
What is the proportion of scaffolding-to-sidewalk each census block of Manhattan, New York City, in 2022?



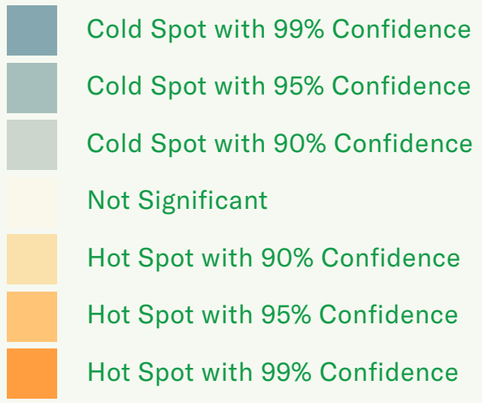
The proportion of scaffolding to sidewalk lends to a better understanding of how much of the sidewalk, and therefore all forms of sidewalk activity and programming, is obscured by scaffolding.

Where are the clusters of low and high proportions of sidewalk length-to-active scaffolding length across Manhattan in 2022?

Census blocks with high proportions of scaffolding length to sidewalk length, are clustered in areas such as Lower Manhattan and Midtown East. Conversely, census blocks with low proportion proportions of scaffolding length to sidewalk length are clustered in Chinatown, the lower east side, and east harlem. In 50% of census blocks, less than 10% of the sidewalk is covered by scaffolding.

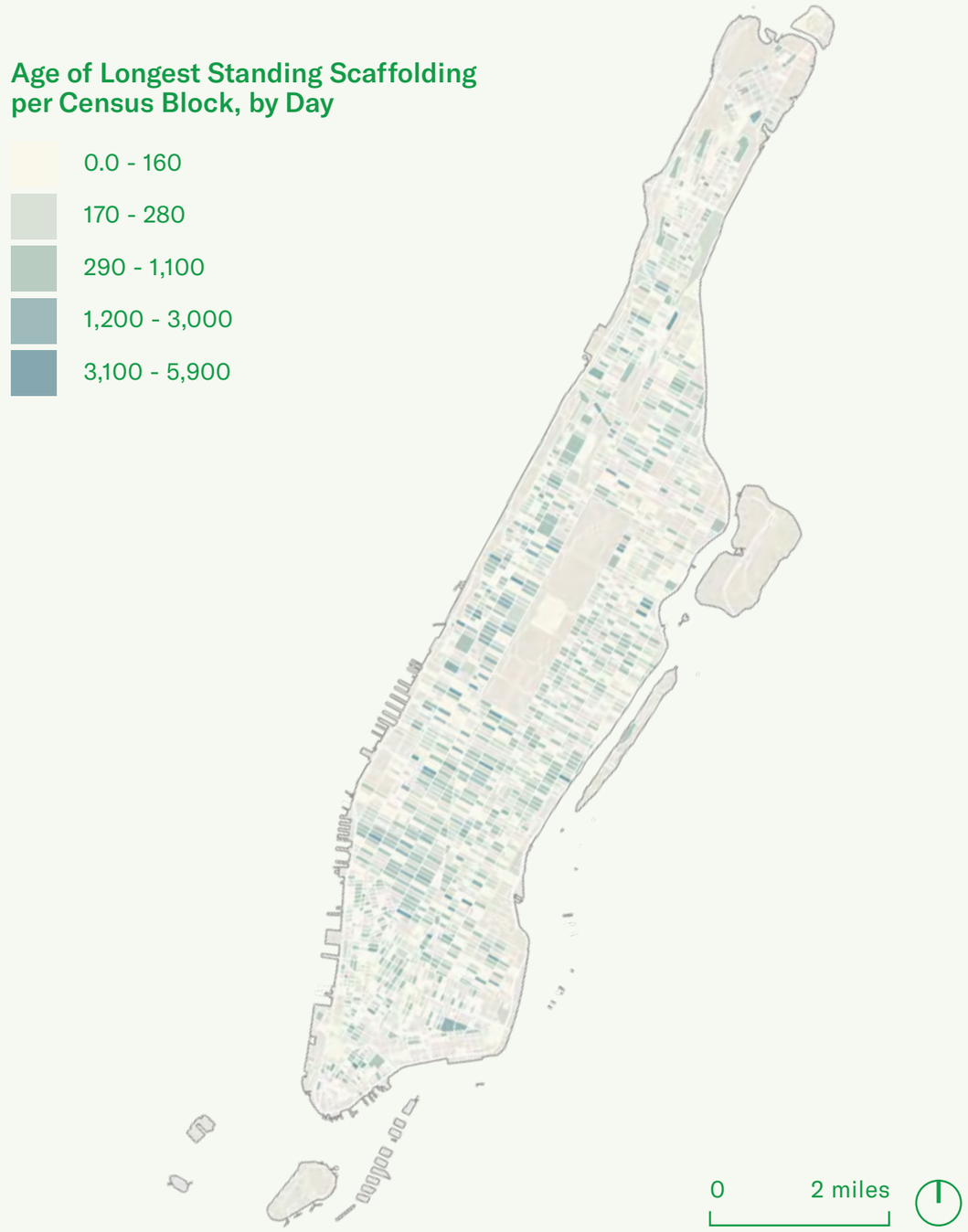


Getis-Ord GI* Cluster Analysis of Maximum Age of Scaffolding Per Census Block, 2022



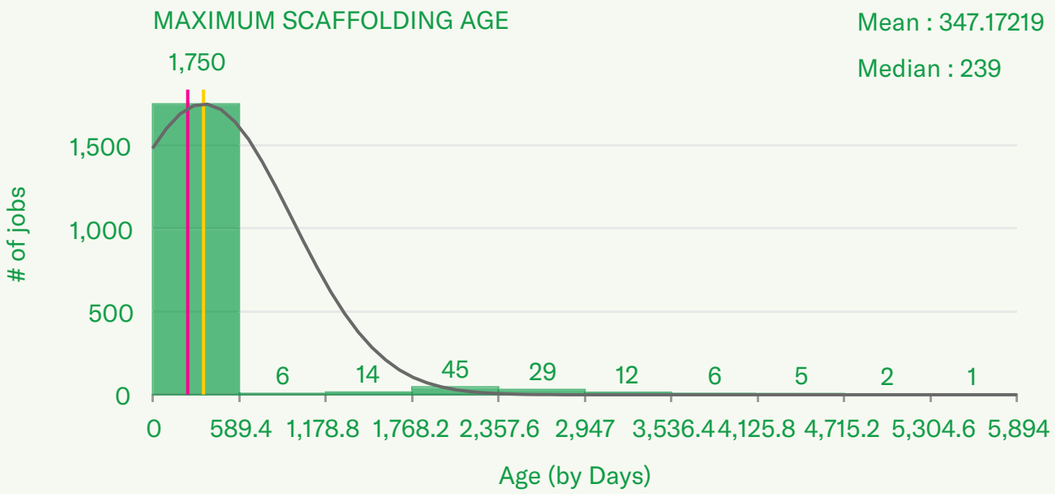
What is the age of the longest-standing active scaffold within each Manhattan census block in 2022?

The installation and removal of scaffolding is determined by several factors including the need for maintenance, new construction, and the ability to fund it. Scaffold age can range from 2 days to 5900 day— approximately 16 years.



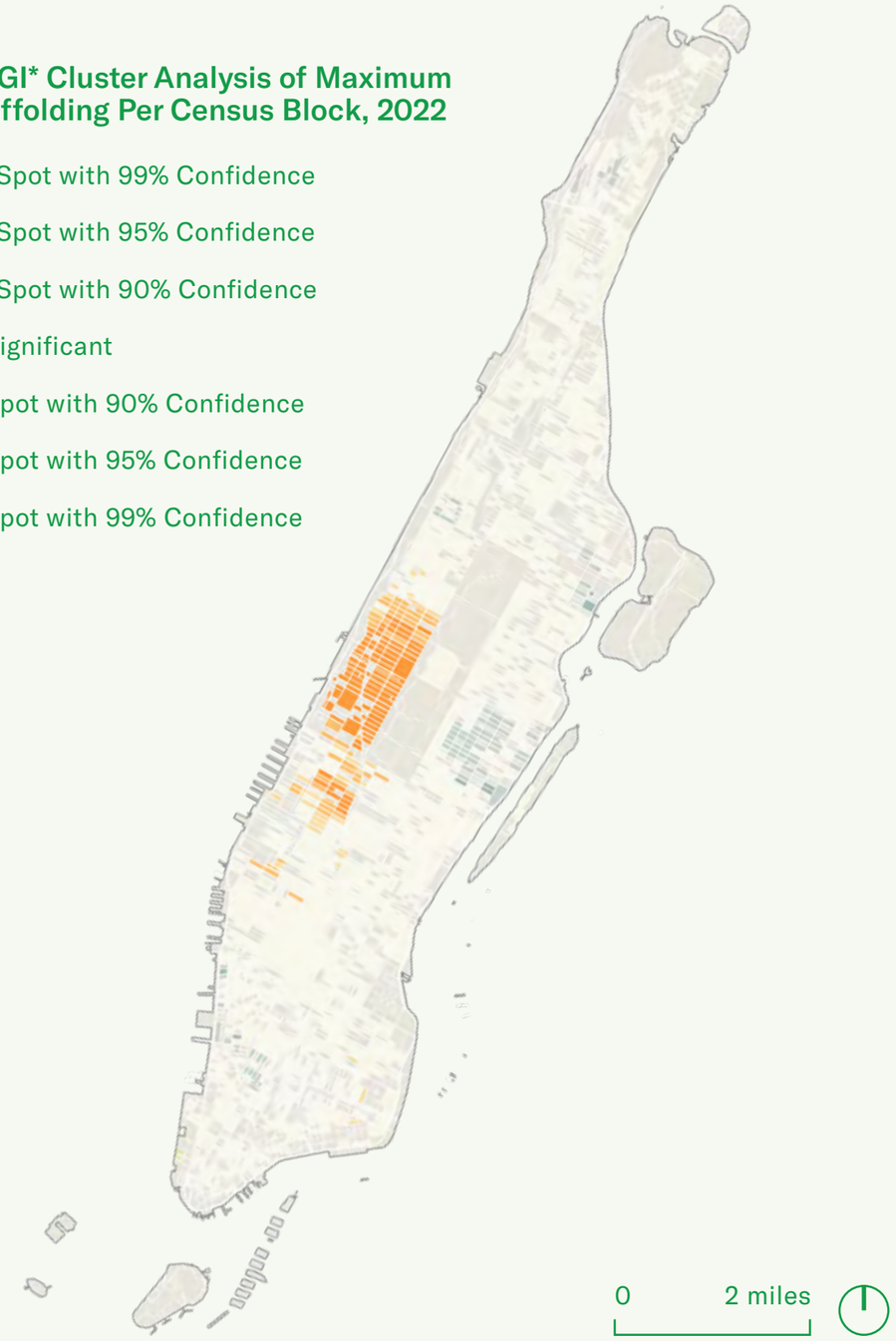
Where are the clusters of longstanding and shortstanding scaffolding across Manhattan in 2022?

Census blocks with the longest standing scaffolding can be found in areas within the upper west side. On the other hand, shortest standing scaffolding is prevalent in areas such as Lennox Hill and the West Village. The median age of scaffolding is 239 dats while the maximum or oldest age is 5849. The distribution of scaffolding age is skewed to the left, with some older outliers pulling the distribution to the right.

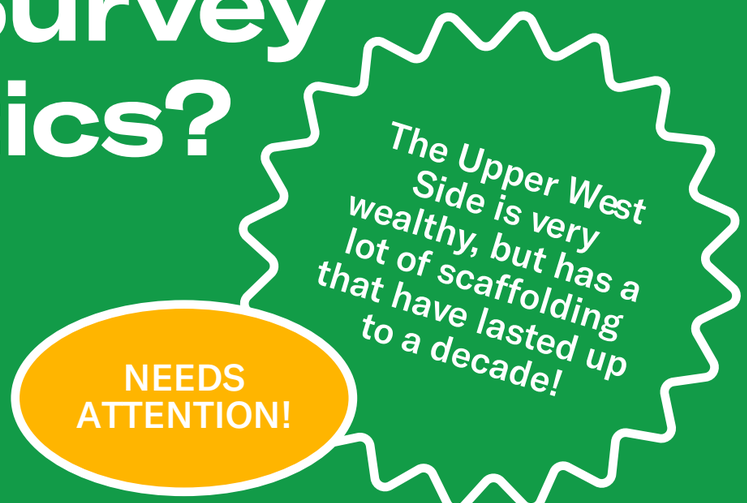


Getis-Ord GI* Cluster Analysis of Maximum Age of Scaffolding Per Census Block, 2022

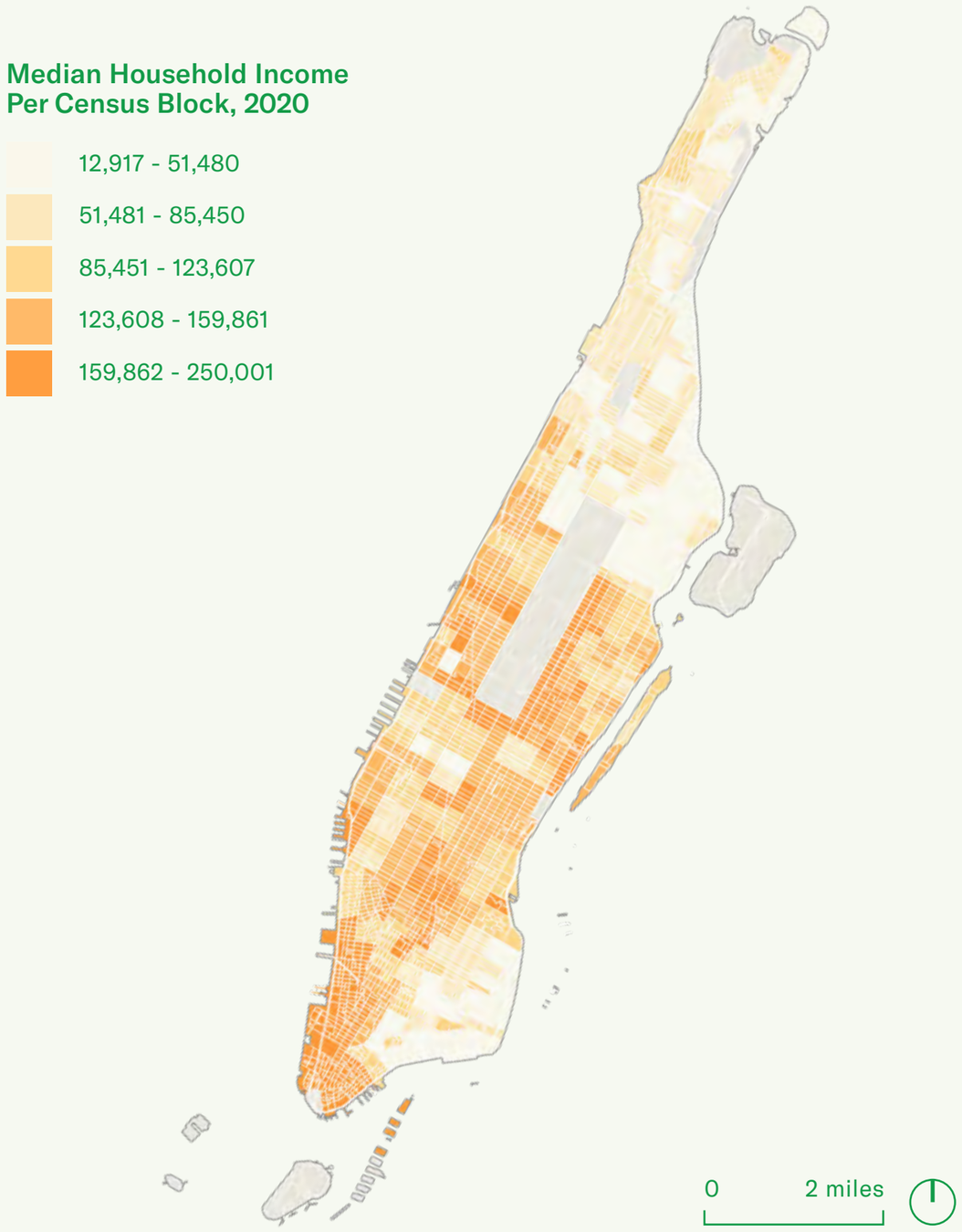
- Cold Spot with 99% Confidence
- Cold Spot with 95% Confidence
- Cold Spot with 90% Confidence
- Not Significant
- Hot Spot with 90% Confidence
- Hot Spot with 95% Confidence
- Hot Spot with 99% Confidence



2. How does the landscape of scaffolding compare with the spatial distribution of American Community Survey demographic characteristics?



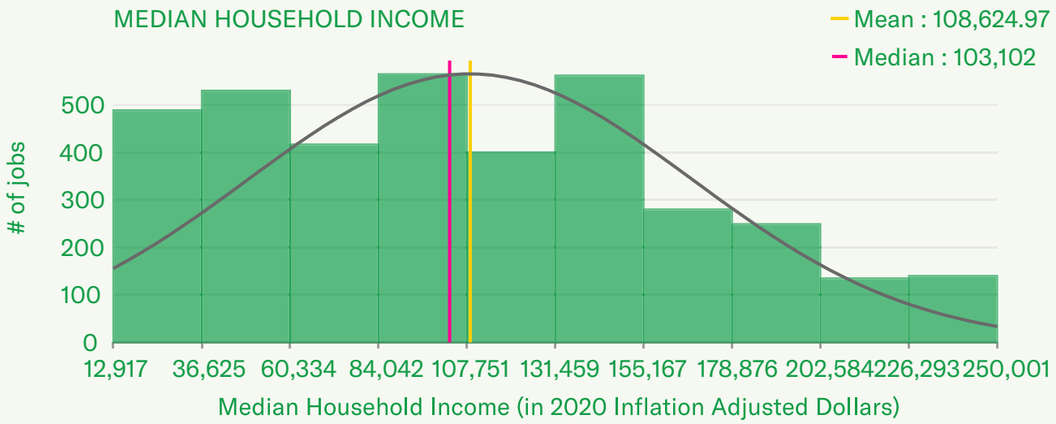
What is the median household income (in 2020 inflation adjusted dollars) within each Manhattan census block in 2022?



Manhattan's socioeconomic diversity lends itself to high levels of income disparity, leading to inequitable experiences of the built environment across the borough—even at the block level.

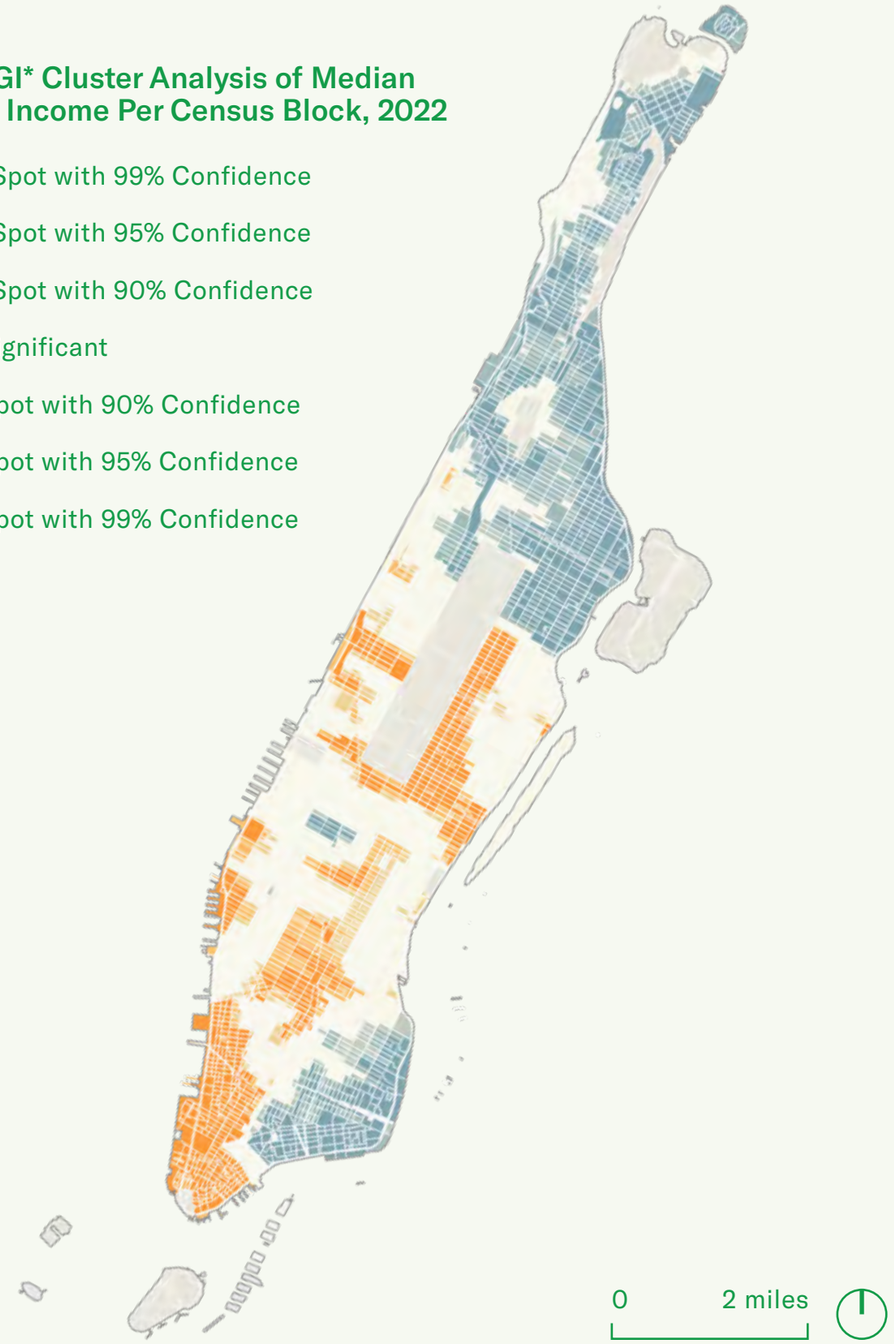
Where are the clusters of low and high median household income across Manhattan in 2020?

Hot spots of high income are clustered in areas such as the upper west side, the west village, lower manhattan, midtown west, among others. Hot spots of lower incomes are generally located in areas of Upper Manhattan, and the Lower East Side. The distribution of income is slightly skewed to the right, with a median of $103,102



Getis-Ord GI* Cluster Analysis of Median Household Income Per Census Block, 2022

- Cold Spot with 99% Confidence
- Cold Spot with 95% Confidence
- Cold Spot with 90% Confidence
- Not Significant
- Hot Spot with 90% Confidence
- Hot Spot with 95% Confidence
- Hot Spot with 99% Confidence



Where do the clusters of low and high median household income intersect with clusters of low and high sidewalk-to-active scaffolding proportion?

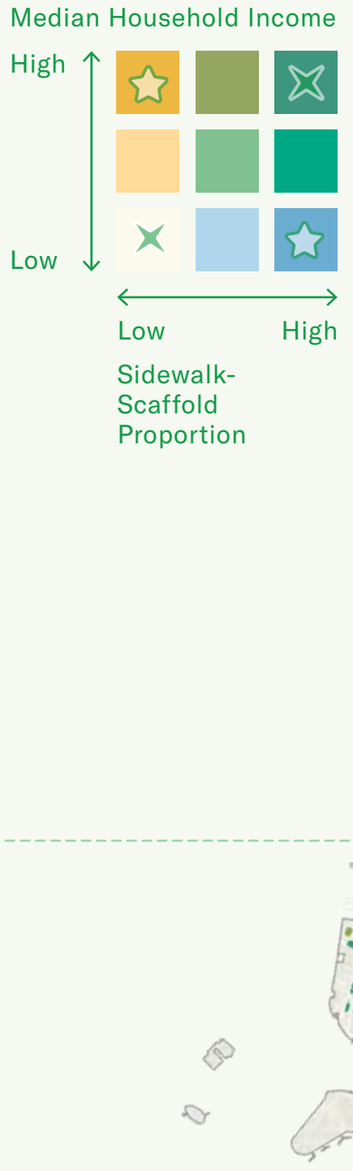
- In the Lower East Side, there are clusters of low median household income that intersect with clusters of high scaffold coverage per block, in line with the initial hypothesis
- In Chinatown, contrary to our hypothesis, clusters of low median household income intersect with clusters of low scaffold coverage. Given the density evident in that area, the lack of scaffolding may be indicative a lack of inspection of maintenance overall.
- In Lower Manhattan, clusters of high median household income intersect with clusters of high scaffolding coverage, possibly indicating perhaps large scale development and construction overall.

What's in the low-low intersections?

145 STANTON ST.

Erected for construction and maintenance purposes, this scaffold covers 48.14% of the sidewalk at a length of 1,200 feet.

Bivariate Analysis: Median Household Income and Proportion of Scaffolding Coverage

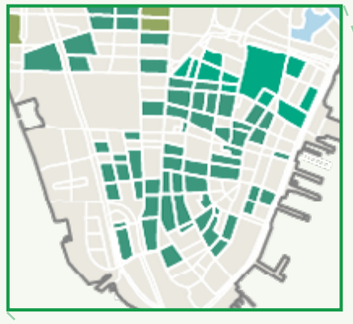


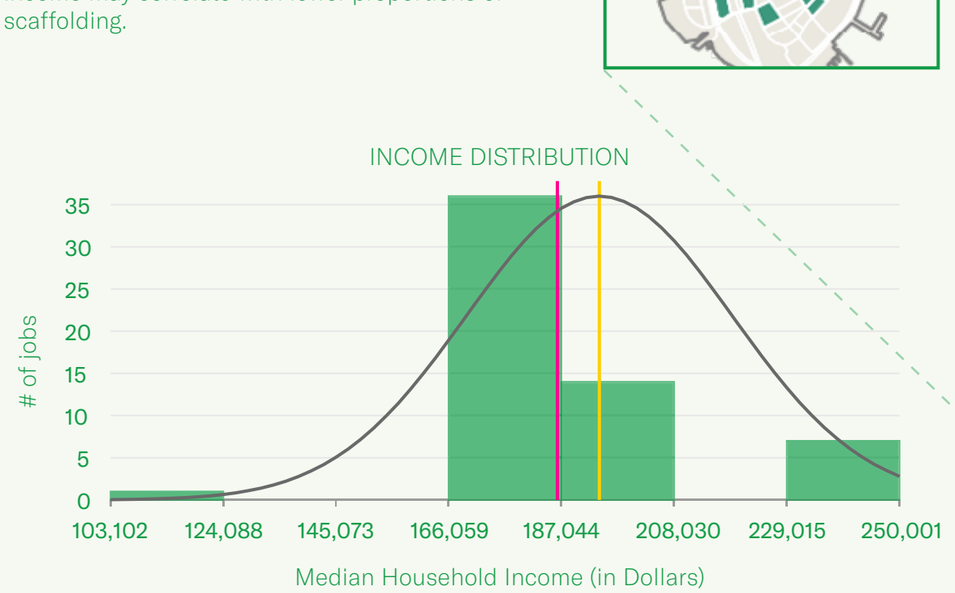
RELATIONSHIP BETWEEN MEDIAN HOUSEHOLD INCOME AND SCAFFOLDING PROPORTION

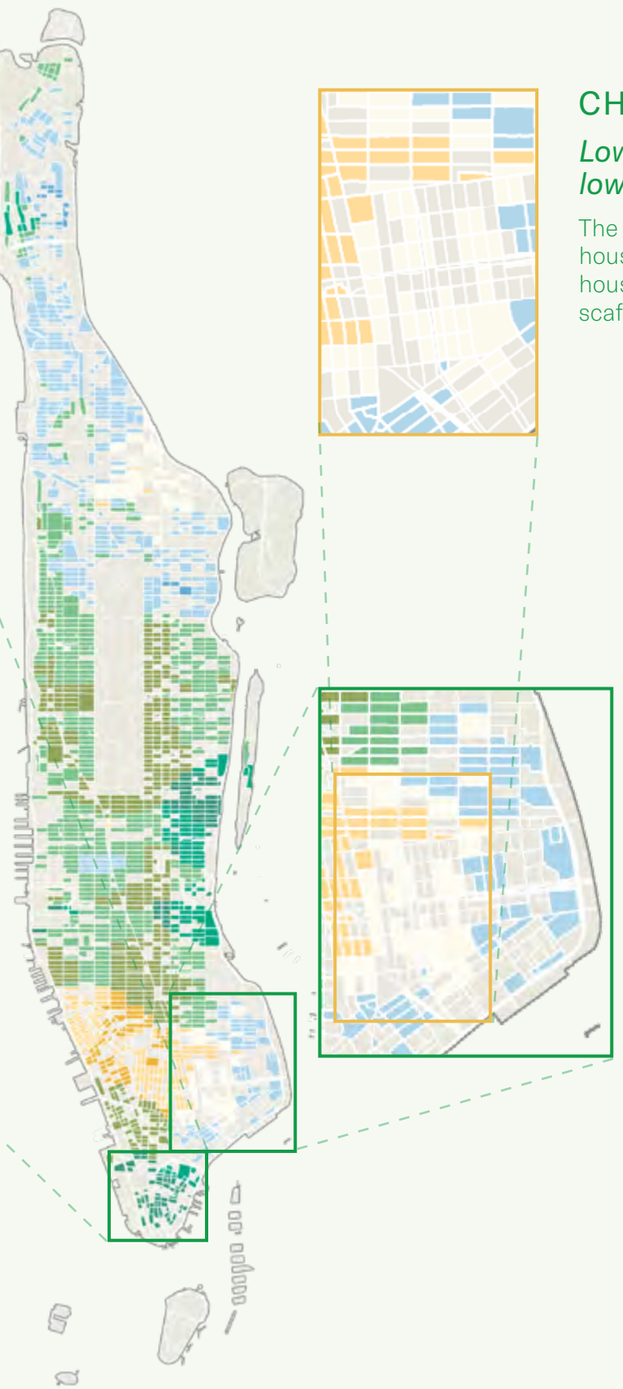
LOWER MANHATTAN

High median household income with a cluster of high scaffolding proportion

The prevalence of high scaffolding coverage in a high median household income is contrary to the hypothesis that higher household income may correlate with lower proportions of scaffolding.



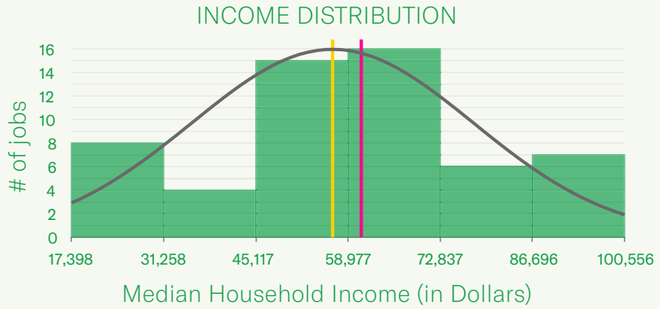




CHINATOWN

Low median household income with a cluster of low scaffolding proportion

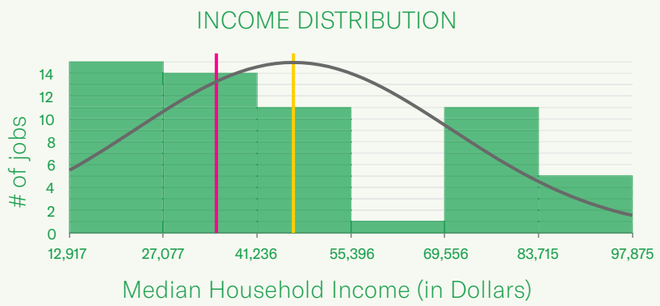
The prevalence of low scaffolding proportion in a low median household income is also contrary to the hypothesis that lower household income may correlate with higher proportion of scaffolding.



LOWER EAST SIDE

Low median household income with a cluster of high scaffolding proportion

The prevalence of high scaffolding coverage in a low median household income is in alignment with the hypothesis that lower household income may correlate with higher proportion of scaffolding coverage.



Where do the clusters of low and high median household income intersect with clusters of longstanding and shortstanding scaffolding?

☆ In the West Village, higher incomes intersect with shortstanding scaffolding, proving the hypothsis presented.

☆ Similarly, in areas such as the Lower East Side and Upper Manhattan, lower incomes intersect with longstanding scaffolding, also proving the hypothesis.

✕ Notably, in the Upper West Side, higher incomes intersect with longstanding scaffolding. An analysis showed that this was due to the presence of exceptionally longstanding scaffolding as outliers.

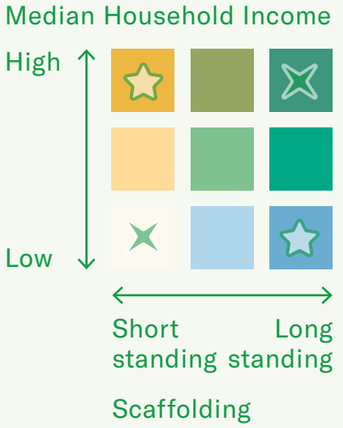
What's in the long-low intersections?

DID YOU KNOW?
Thurgood Marshall and W.E.B. Du Bois have lived here!

409 EDGECOMBE AV

A 220 feet long scaffold in a low median household income area, erected for Local Law 11. At 5,894 day old, it is the **oldest** scaffold in Manhattan.

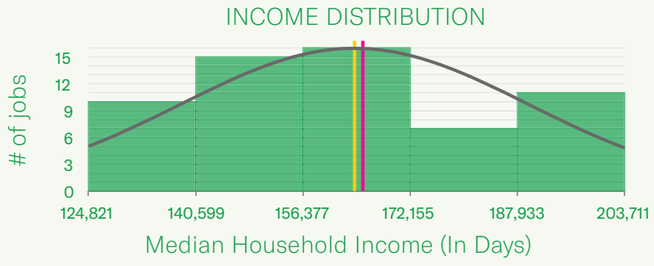
Bivariate Analysis: Median Household Income and Maximum Scaffolding Age

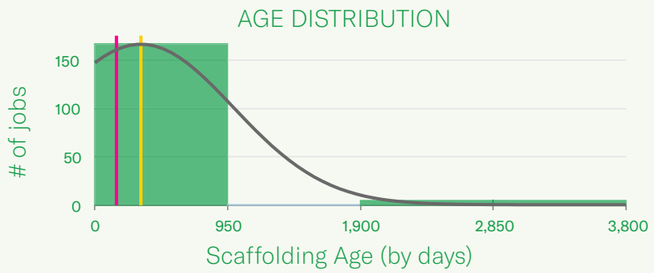


RELATIONSHIP BETWEEN MEDIAN HOUSEHOLD INCOME AND SCAFFOLDING AGE

LINCOLN SQUARE& CLINTON

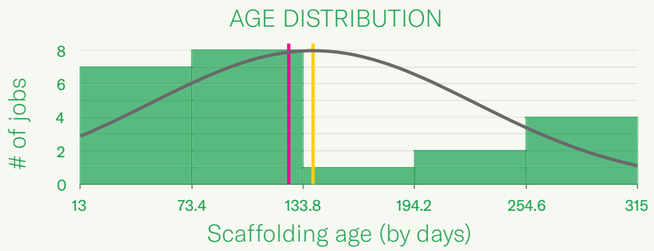
High median household income, with a cluster of longstanding scaffolding

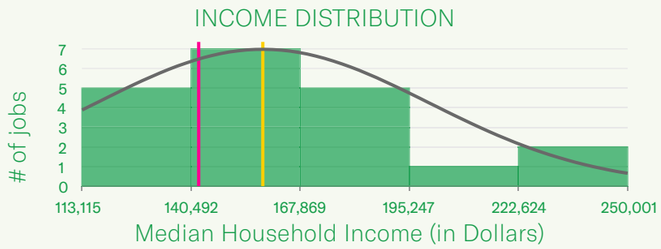


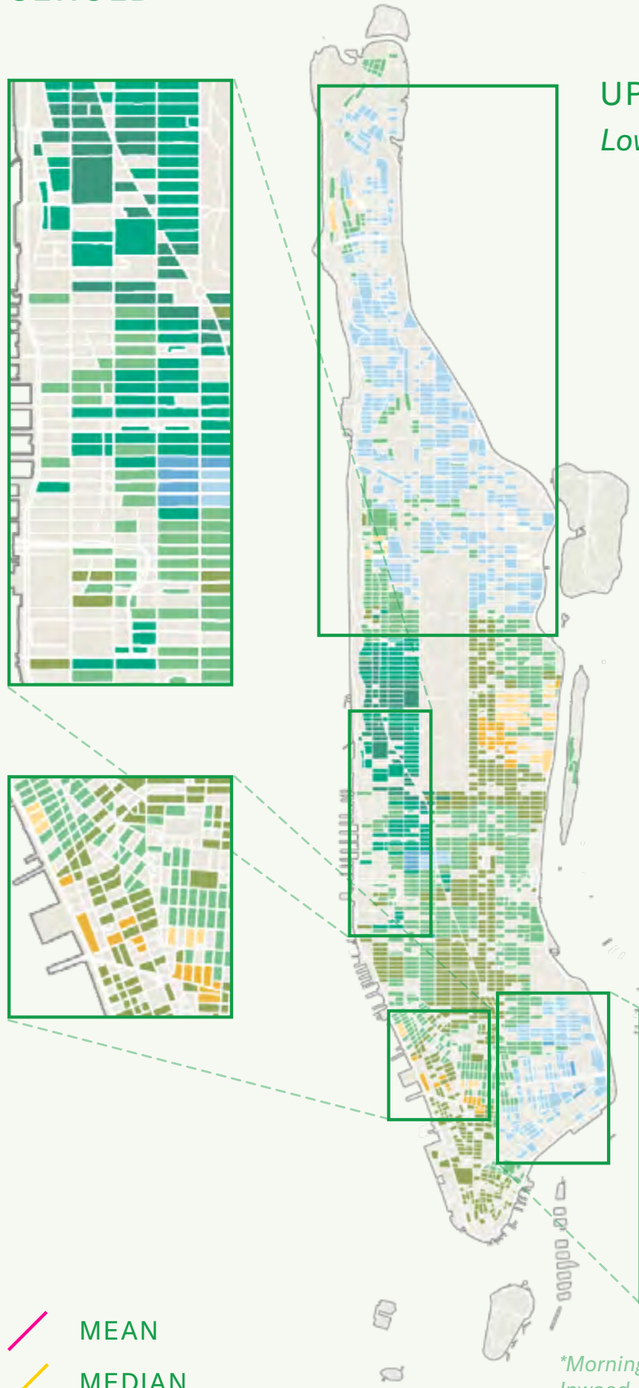


WEST VILLAGE

High median household income with a cluster of shortstanding scaffolding

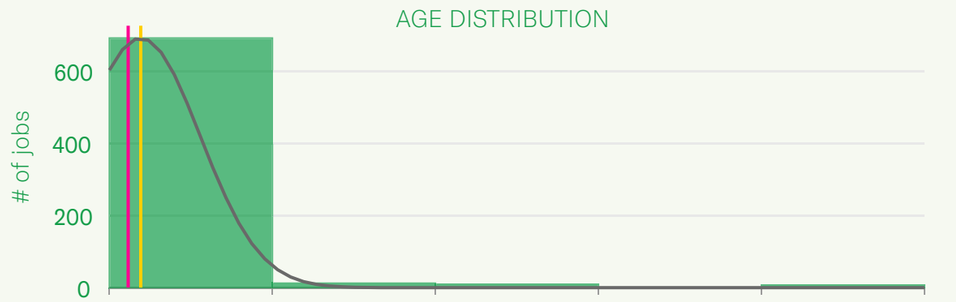


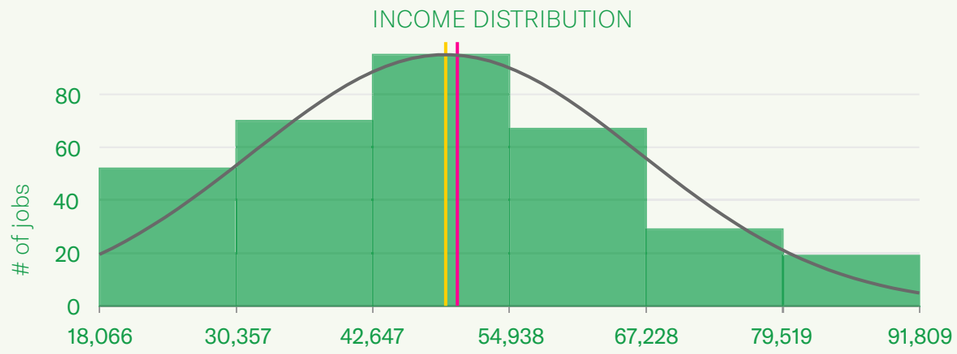




UPPER MANHATTAN*

Low median household income, with clusters of longstanding scaffolding



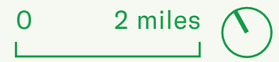


LOWER EAST SIDE

Low median household income, with clusters of longstanding scaffolding

The prevalence of longstanding scaffolding in low median household income areas are in alignment with our hypothesis that higher proportions of low income households may correlate with longer durations of scaffolding erection.

**Morningside Heights, Harlem, Washington Heights, Inwood, Manhattanville, Hamilton Heights*



Lenox Hill has a lot of commercial area, and its scaffolding are shortstanding!

QUICK AND BUSY!

The range of commercial floor area per block is from 0 to 250,000 sq. ft.!

Majority of scaffolding jobs in Lenox Hill are under Local Law 11!

3. How does the landscape of scaffolding compare with the spatial distribution of Primary Land Use Tax Lot Output (PLUTO) commercial land use?

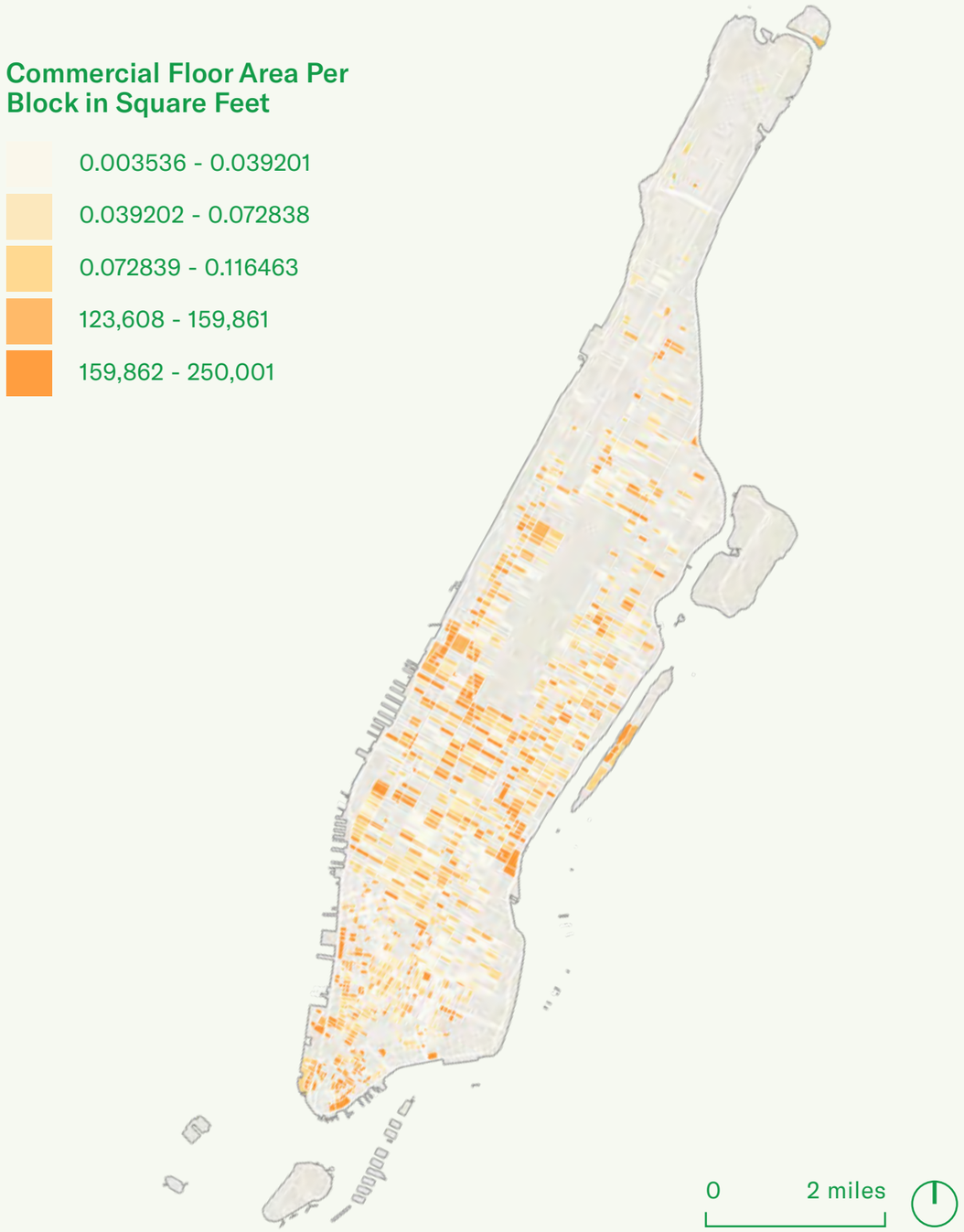
In 50% of all census blocks in Manhattan, commercial lot coverage is below 10%!

QUIET AND EFFICIENT!

The West Village has a high proportion of commercial lot area, with both low scaffold age and coverage!

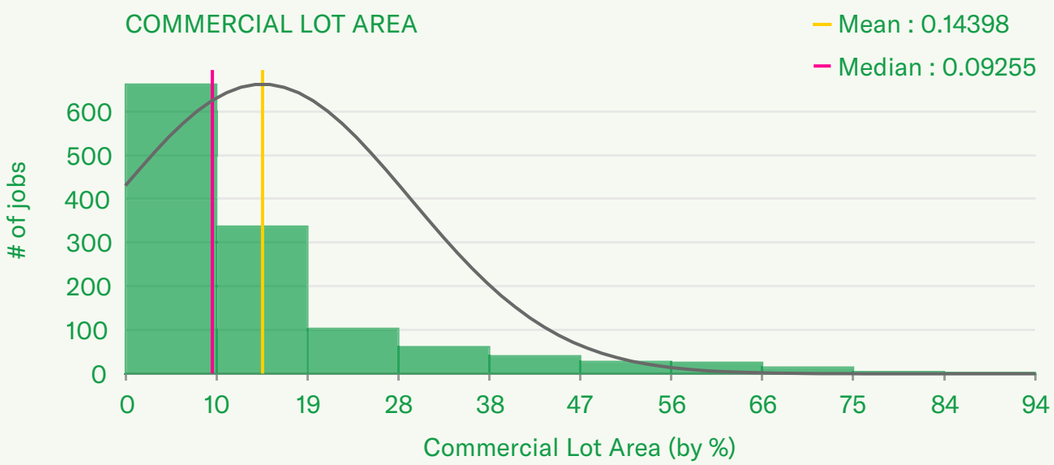
What is the proportion of commercial lot area-to-total census block area, as defined by building use class, within each Manhattan census block in 2022?

Due to the density of Manhattan's urban grain, the stacking of diverse building uses have a symbiotic relationship with the ground-level pedestrian sidewalk experience. In turn, the proportion of commercial use by block may dictate the erection—or lack thereof—of scaffolding.



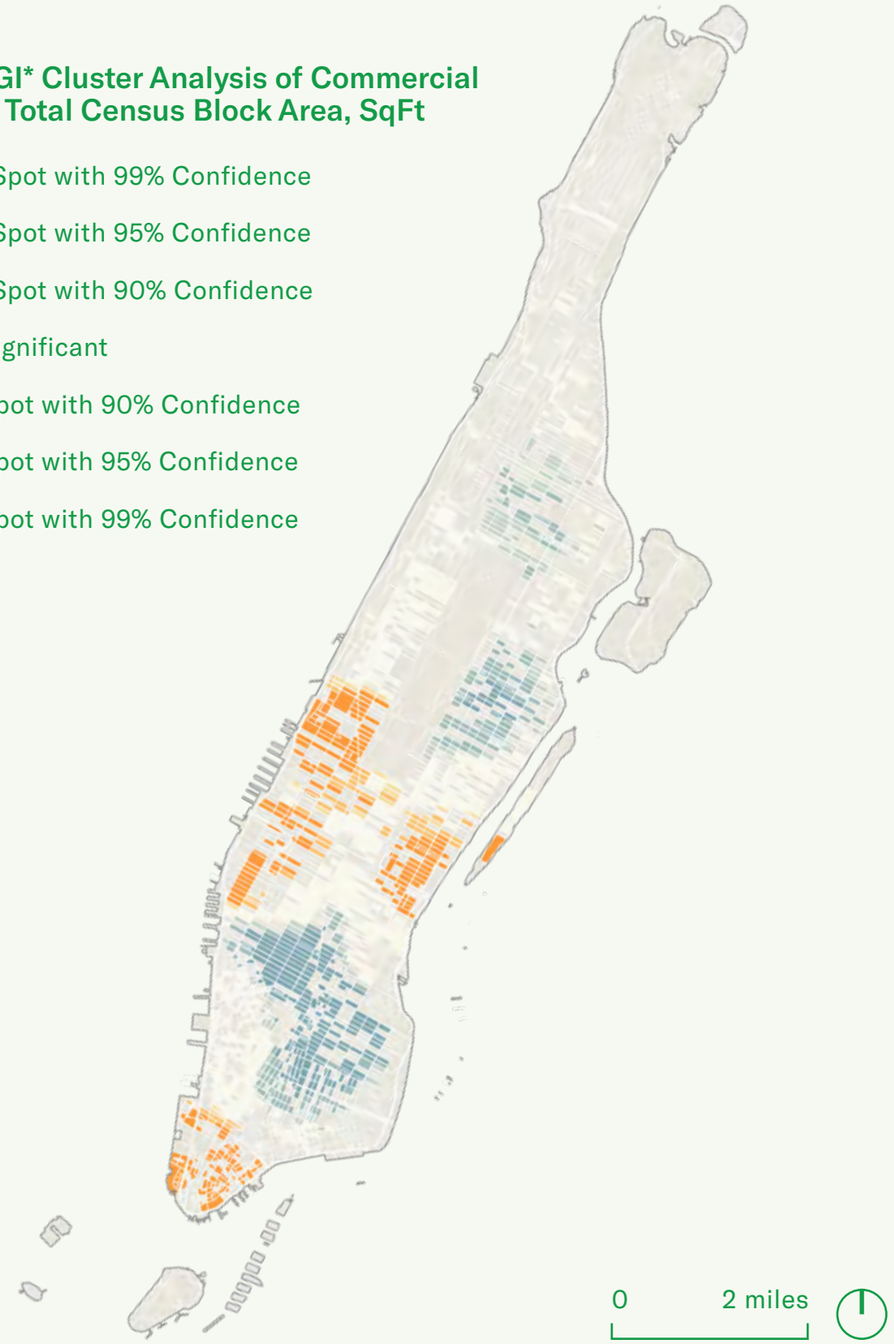
Where are the clusters of low and high proportions of commercial lot area-to-total census block area across Manhattan in 2022?

Census blocks with a high proportion of commercial lot coverage are located in areas such as Lower Manhattan, Midtown West, Lincoln Square, and Midtown West. Census blocks with a low proportion of commercial lot coverage are found in areas such as the Upper East Side, and Central Harlem. In 50% of Census Blocks, commercial lot coverage is below 10%.



Getis-Ord GI* Cluster Analysis of Commercial Lot Area to Total Census Block Area, SqFt

- Cold Spot with 99% Confidence
- Cold Spot with 95% Confidence
- Cold Spot with 90% Confidence
- Not Significant
- Hot Spot with 90% Confidence
- Hot Spot with 95% Confidence
- Hot Spot with 99% Confidence



Where do the clusters of low and high proportions of commercial lot-to-census block area intersect with clusters of low and high sidewalk-to-active scaffolding proportion?

☆ A high proportion of commercial lot area intersecting with a low proportion of scaffolding coverage is solely witnessed in the West Village, supporting the hypothesis that commercial use may correlate with lower scaffolding coverage.

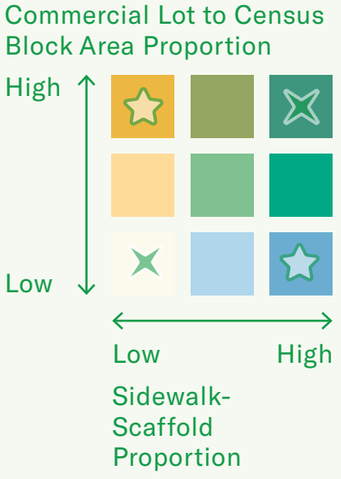
✦ However, high-to-high overlaps of commercial lot-to-census block area and sidewalk-to-scaffolding proportions are observed in Lower Manhattan and Turtle Bay-East Midtown, demonstrating a significant contradiction to assumptions of the hypothesis.

What's in the low-high intersections?

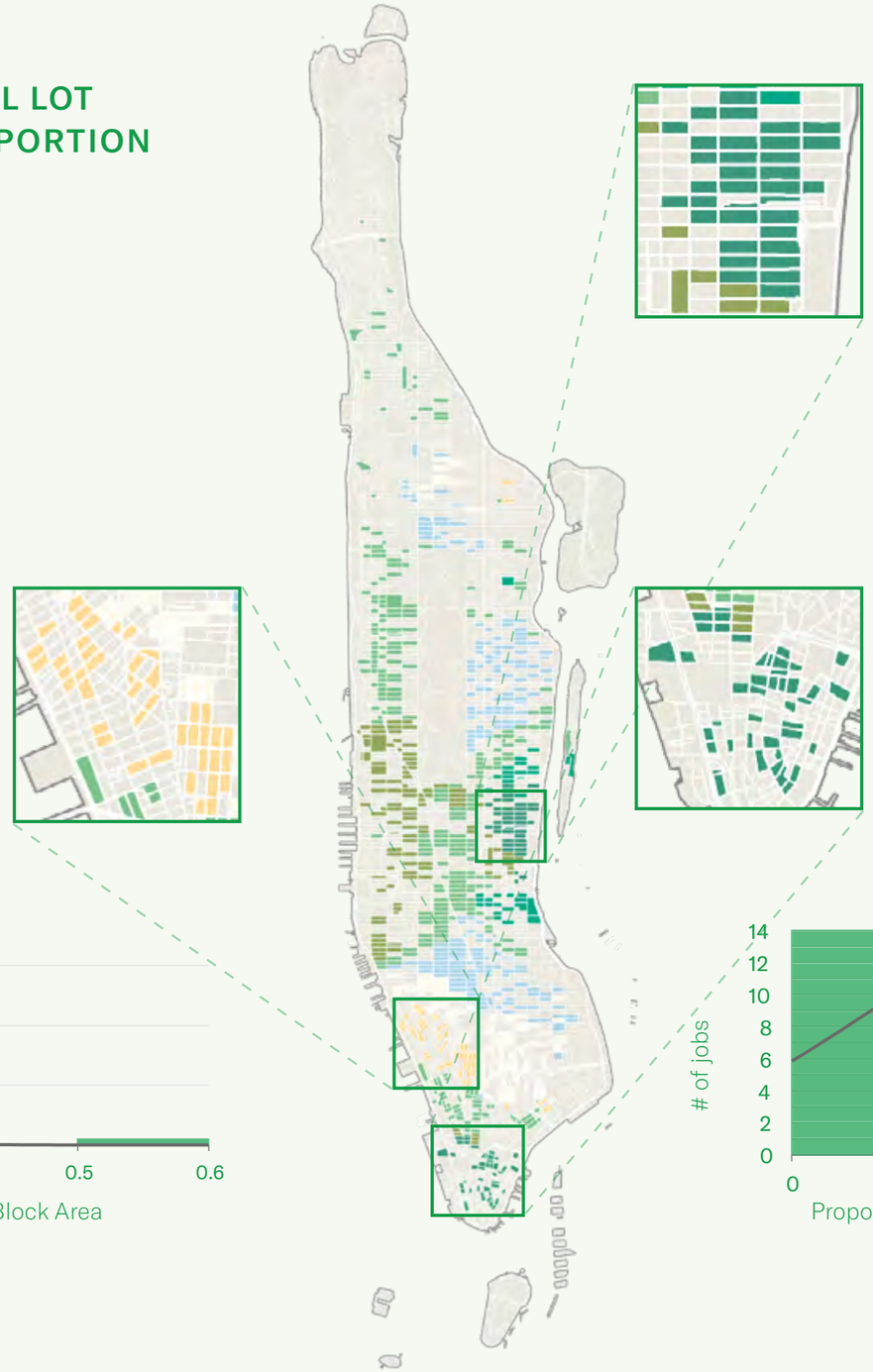
160 BLEECKER ST.

As a scaffold erected for Local Law 11, it is 436 feet long and covers 24.18% of the sidewalk within the census block.

Bivariate Analysis: Proportion of Commercial Lot Coverage and Proportion of Scaffolding Coverage



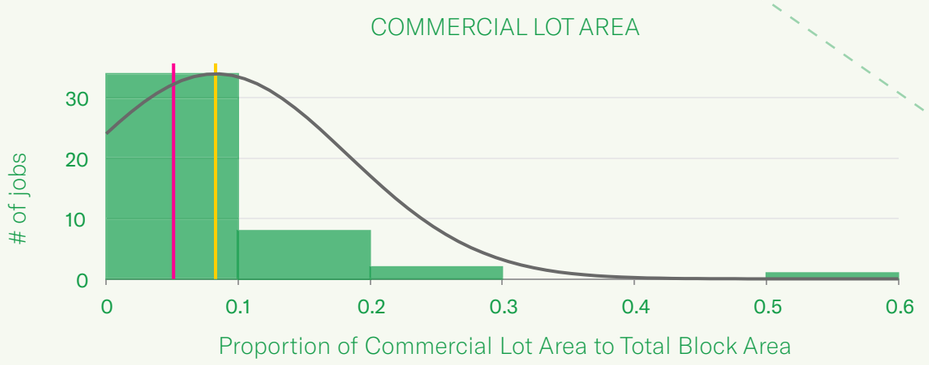
RELATIONSHIP BETWEEN COMMERCIAL LOT PROPORTION AND SCAFFOLDING PROPORTION



WEST VILLAGE

High proportion of commercial lot area, and a low proportion of scaffolding coverage.

The low proportion of scaffolding coverage in a high proportion commercial lot area is in alignment with the hypothesis that higher proportions of commercial use may correlate with shorter duration of scaffolding erection.



TURTLE BAY-EAST MIDTOWN

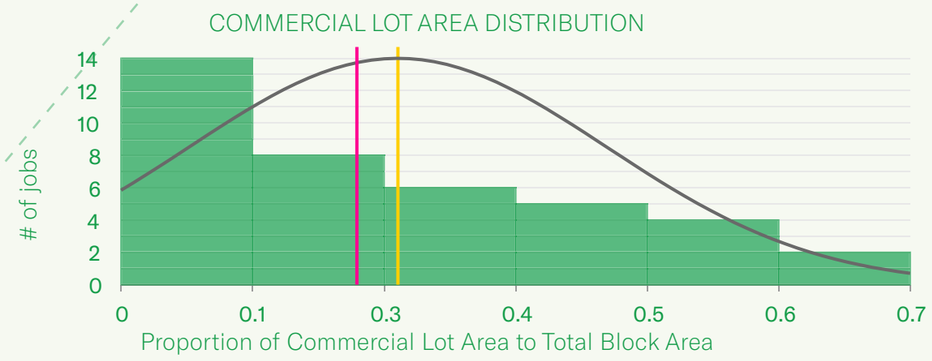
High proportion of commercial lot area, and a high proportion of scaffolding coverage.

The high proportion of scaffolding coverage in high proportion commercial lot areas contradicts with the hypothesis that higher proportions of commercial use may correlate with shorter duration of scaffolding erection.

DID YOU KNOW?
High proportion of scaffolding in Lower Manhattan also intersects with a cluster of high median household income!

LOWER MANHATTAN

High proportion of commercial lot area, and a high proportion of scaffolding coverage.



Where do the clusters of low and high proportions of commercial lot-to-census block area intersect with clusters of longstanding and shortstanding scaffolding?

☆ The prevalence of longstanding scaffolding in high commercial lot proportion areas of Lincoln Square and Clinton is contrary to the hypothesis that higher proportions of commercial use may correlate with shorter durations of scaffolding erection. However, this contradiction may be attributable to 9 exceptionally old scaffolds within that area.

What's in the long-high intersections?

33 W 60TH STREET

3380 day old scaffold in a high-proportion of commercial lot area and longstanding scaffold area of Lincoln Square.

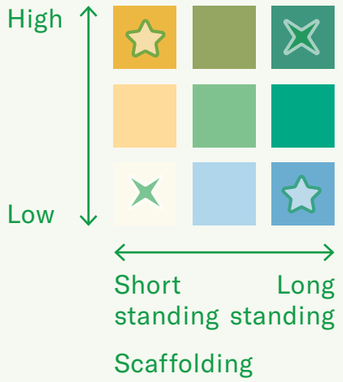
✕ Smaller intersecting clusters of high commercial lot area proportion and shortstanding scaffolding are witnessed in Lenox Hill-Roosevelt Island and West Village.

BLESSED SACRAMENT ROMAN CATHOLIC CHURCH

2338 day old scaffold, also, in a high-proportion of commercial lot area and longstanding scaffold area of Lincoln Square.

Bivariate Analysis: Proportion of Commercial Lot Coverage and Maximum Scaffolding Age

Commercial Lot to Census Block Area Proportion



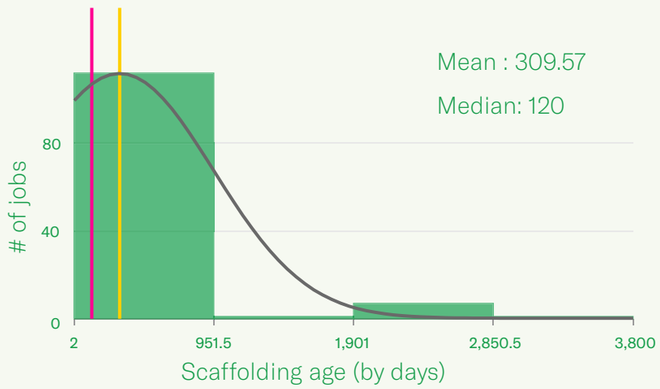
RELATIONSHIP BETWEEN COMMERCIAL LOT PROPORTION AND SCAFFOLDING AGE

LINCOLN SQUARE & CLINTON

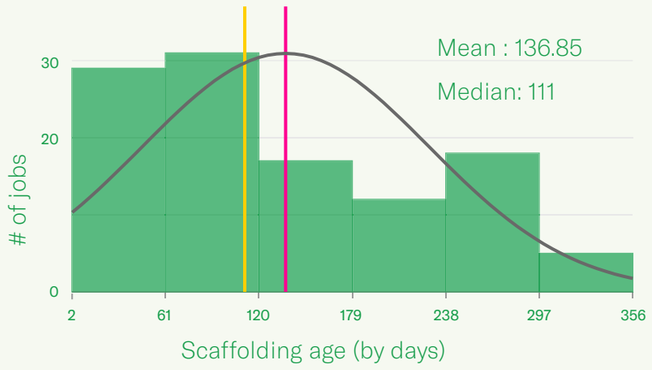
High proportion of commercial lot area, with a cluster of longstanding scaffolding

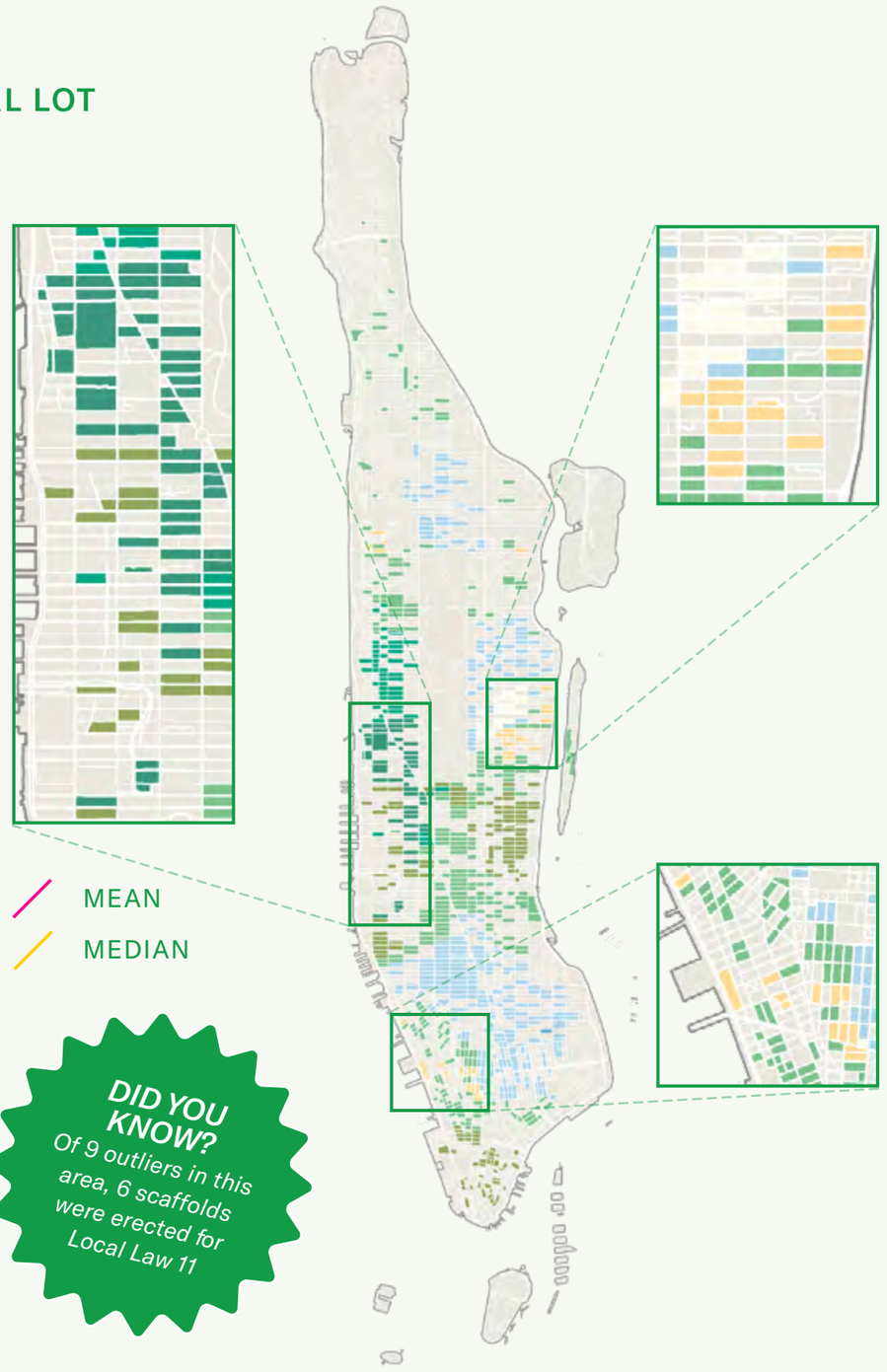
The prevalence of longstanding scaffolding in a high commercial lot proportion area is contrary to our hypothesis that higher proportions of commercial use may correlate with shorter duration of scaffolding erection. This may be attributed to the presence of several outliers--

AGE DISTRIBUTION WITH OUTLIERS



AGE DISTRIBUTION WITHOUT OUTLIERS





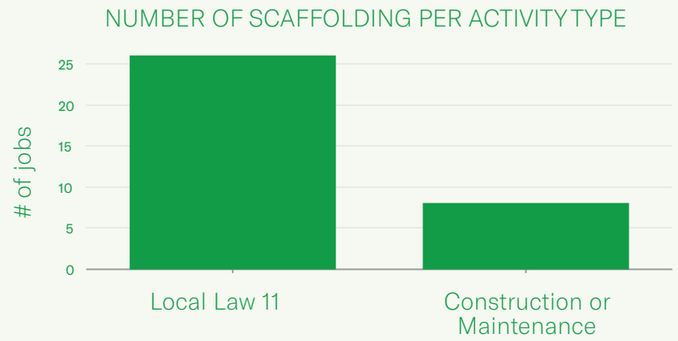
DID YOU KNOW?
Of 9 outliers in this area, 6 scaffolds were erected for Local Law 11

LENOX HILL-ROOSEVELT ISLAND

High proportion of commercial lot area, with a cluster of shortstanding scaffolding

The prevalence of shortstanding scaffolding in high commercial lot proportion areas are in alignment with our hypothesis that higher proportions of commercial use may correlate with shorter duration of scaffolding erection.

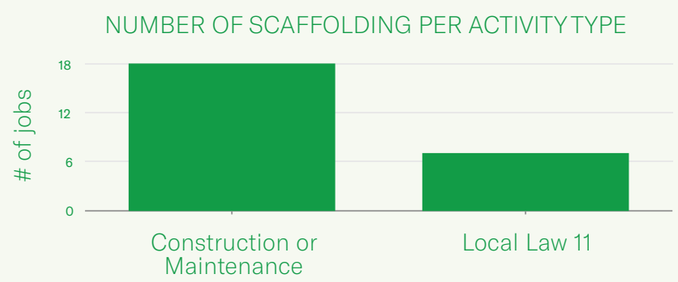
NUMBER OF SCAFFOLDING PER ACTIVITY TYPE



WEST VILLAGE

High proportion of commercial lot area, with a cluster of shortstanding scaffolding

NUMBER OF SCAFFOLDING PER ACTIVITY TYPE



CONCLUSIONS

Correlations may exist between land use, demographic characteristics, and the likelihood of prolonged scaffolding erection. Moreover, different neighborhoods experience disparate built realities of proportional sidewalk coverage by scaffolding. Understanding these interrelationships is imperative to developing legislation that are both contientious of the value that scaffolding brings to public safety, whilst also being sensitive to block-level conditions in New York City.

The geospatial analysis on scaffolding data has generated a multidute of lenses from which one can understand its pervasiveness in correspondence with demographic and legislative factors. The findings, though conclusive to some regard in its confirmation of the aforementioned hypotheses, shows avenues for further exploration into other unexpected combinations in our analysis.

With regards to age, clusters analyses are skewed by outliers suggesting that the problem of “longstanding scaffolding” is isolated to a few but severely neglected structures. Aggregating at block level, therefore, tends to pull clustersin the direction of these outliers. Therefore, enforcement should pay attention to scaffolds that have been erected for an excessive duration of time, anchoring interventions at the hyper-local scale.

In general, the hypothesis that high median household income may overlap with low scaffolding age and proportion, and vice versa remains consistent in our analysis, as highlighted by chosen geographies. As previously discussed, there is both insufficient financial support from the state to facilitate repairs mandated by the FISP law, and insufficient legal pressure and enforcement to ensure that scaffolding is removed in a timely matter. Most often than not, the burden and responsibility of managing scaffolding remains at the disgression of the building owner.

RECOMMENDATIONS

1. HOLD OWNERS ACCOUNTABLE!

Identify the longstanding scaffolds of Manhattan and address the causes for their prolonged erection.

What are the barriers to project completion that are hindering facade repair, in the case of Local Law 11, or construction or maintenance? Are your local scaffolds posing more harm than good to the New Yorkers that they are intended to protect? Talk to your neighbors, and raise awareness for projects that have persisted for excessive periods of time.

2. KNOW THE LAWS!

Tenants have the agency to exert pressure on owners, community boards, and their local city council member to complete repairs for scaffolding removal.

Know the resources available to you, like 311, your local community board, city council member, and even social media, to voice your concerns toward infringements of your rights to the sidewalk.

3. ADVOCATE FOR RENEWED LEGISLATION!

From imposing time limits on repairs, to interventions by the city council, FISP laws may be renewed to mitigate excessive scaffolding.

If you believe that the FISP laws do not sufficiently protect against unmaintained scaffolding, engage with organizations in your community working towards this cause, and learn more about council members in your community district who are working towards sidewalk rehabilitation and scaffolding law reform

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