Building Life Span Prediction

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Sept 10, 2020

Problem

PWC forecasts that

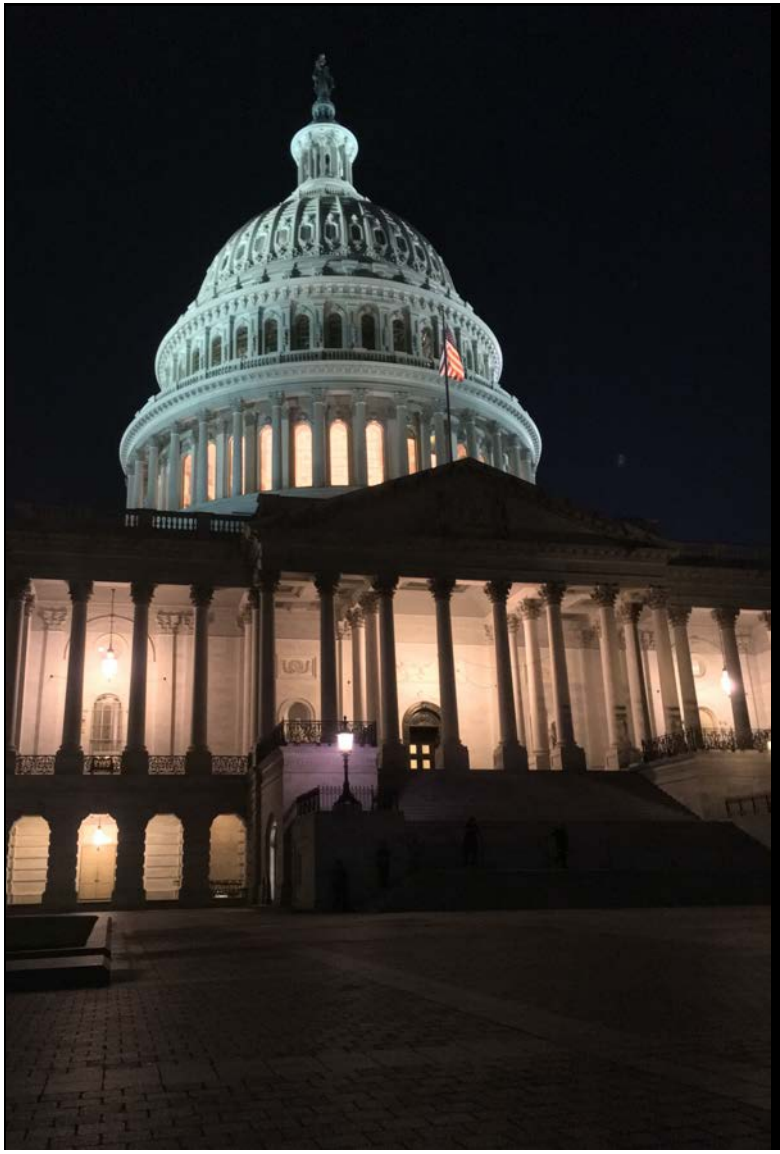
the volume of construction output will grow by 85%

to $15.5 trillion worldwide by 2030.

Customer Profile

Large Real Estate Corporations

- CBRE
- Co-Star
- The Related Company
- JLL



Customer Profile

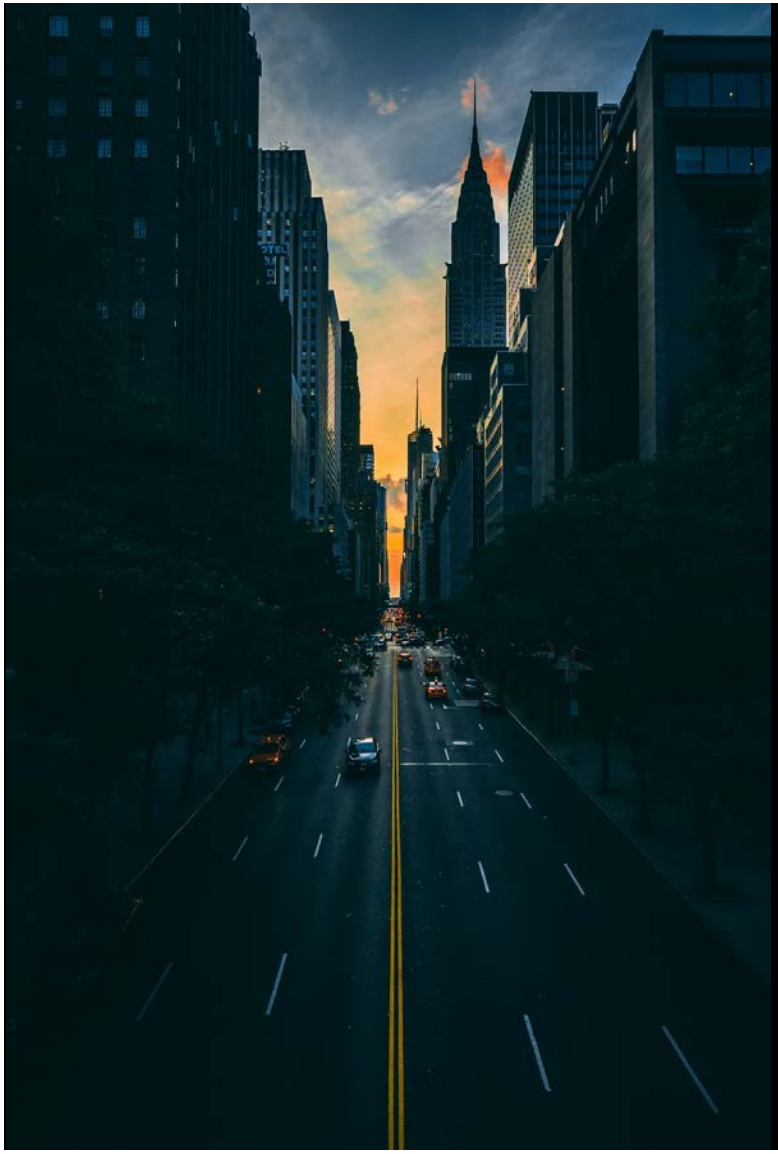
Government Agencies

- HUD
- USACE
- NAVFAC

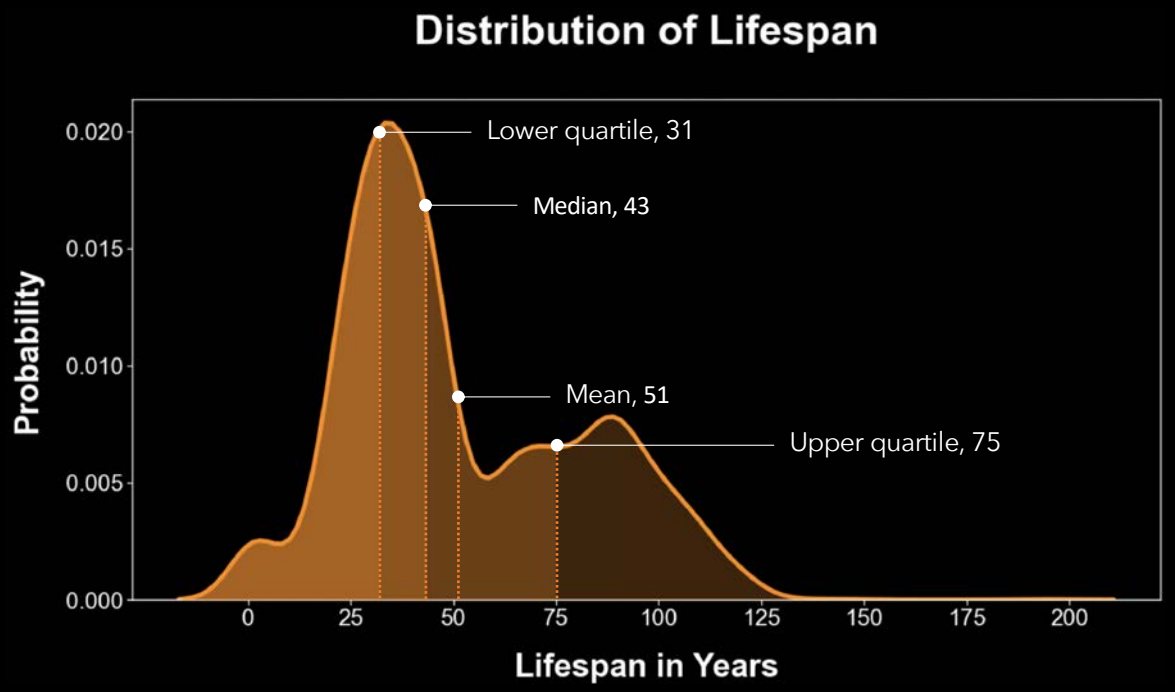
Data

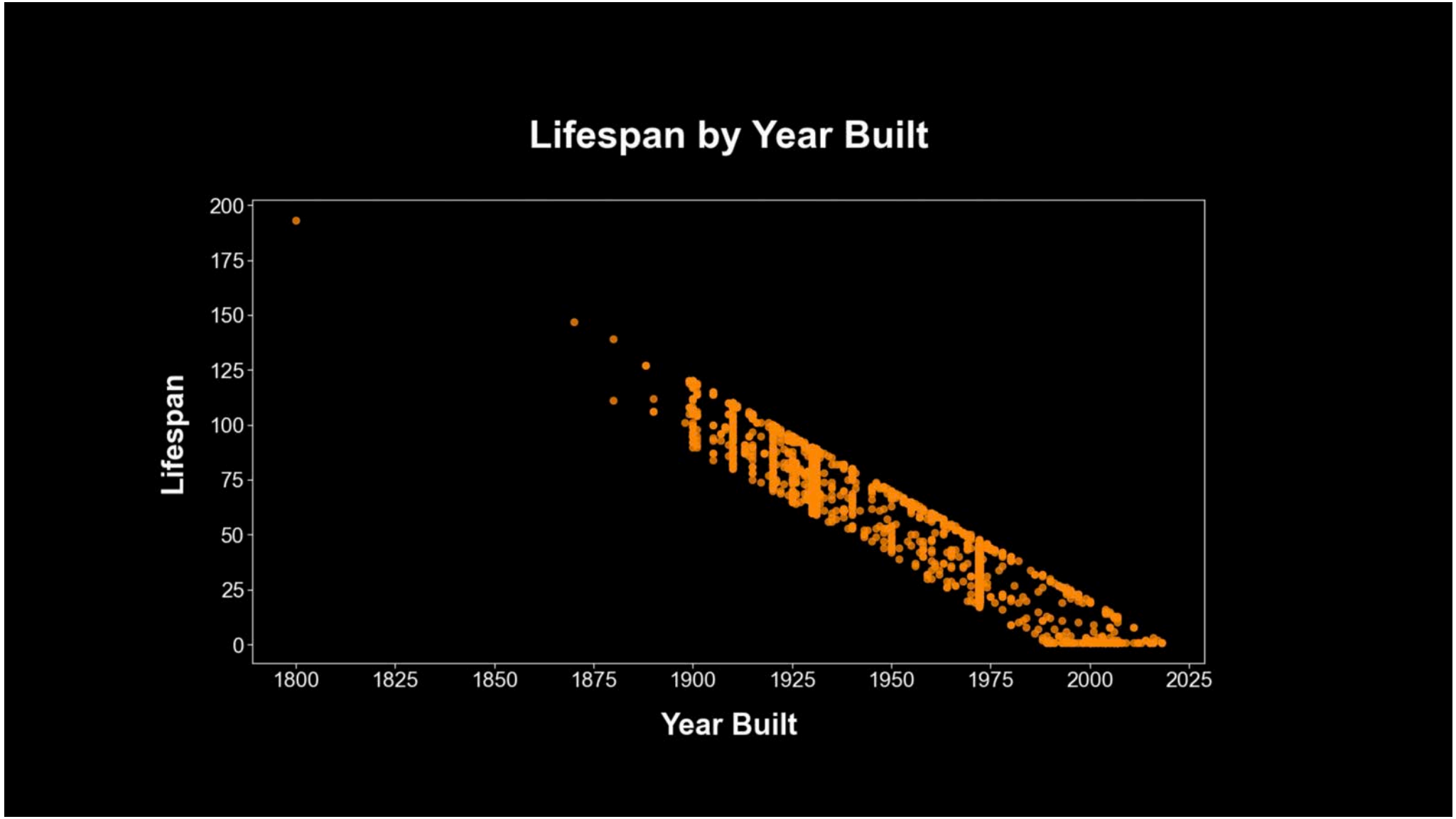
3,500 tax lots
Demolished buildings
Commercial only
Constructed 1800 - 2017

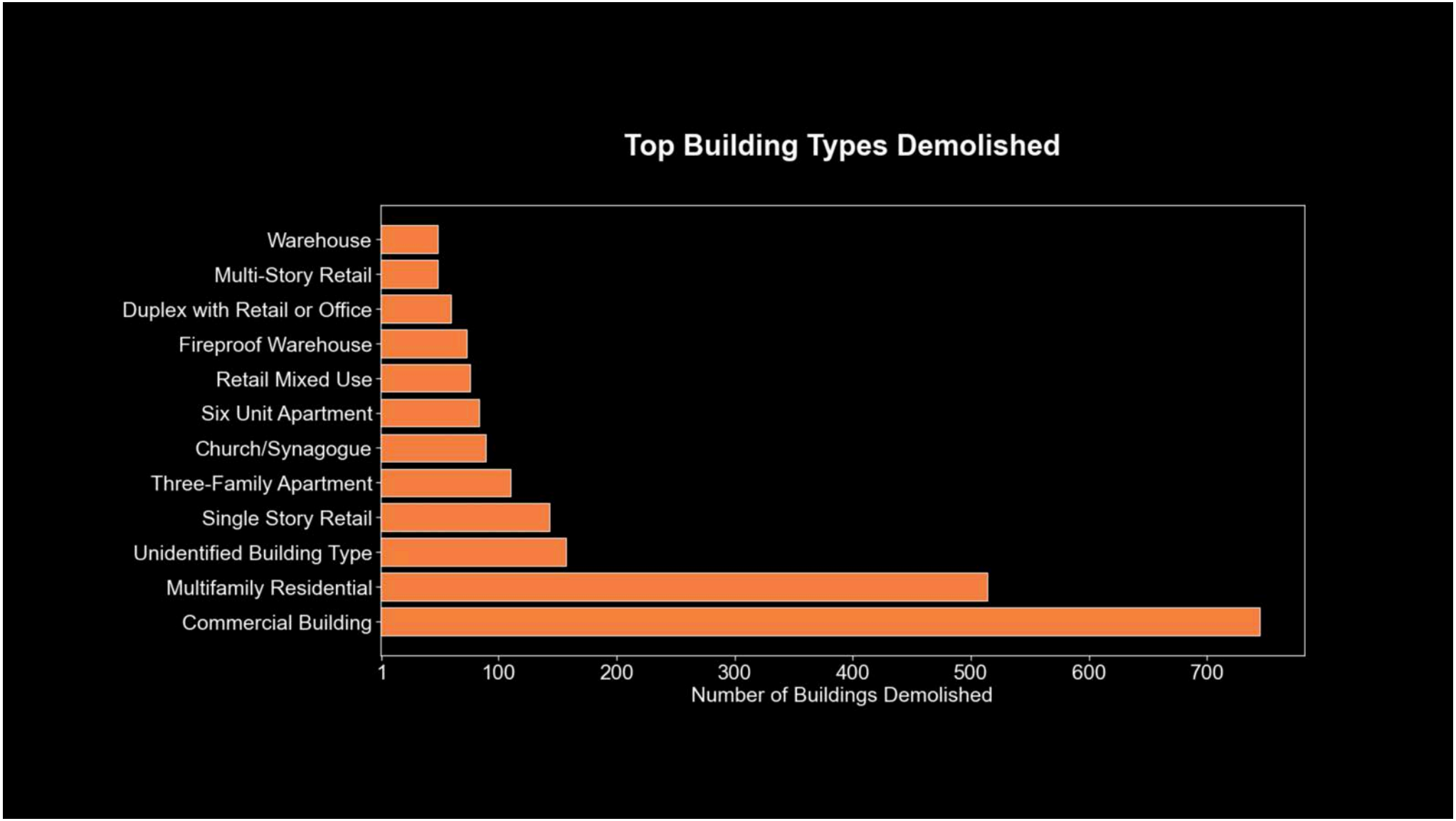
PLUTO + NYC Permits

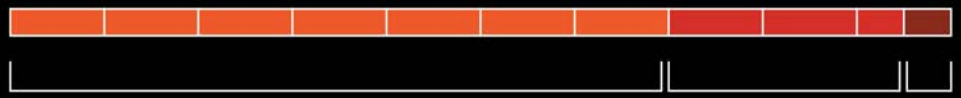


Analysis


Distribution of Lifespan
Lower quartile, 31
Median, 43
Mean, 51
Upper quartile, 75
Probability
0.020
0.015
0.010
0.005
0.000
0
25
50
75
100
125
150
175
200
Lifespan in Years


Lifespan by Year Built
Lifespan
200
175
150
125
100
75
50
25
0
1800
1825
1850
1875
1900
1925
1950
1975
2000
2025
Year Built

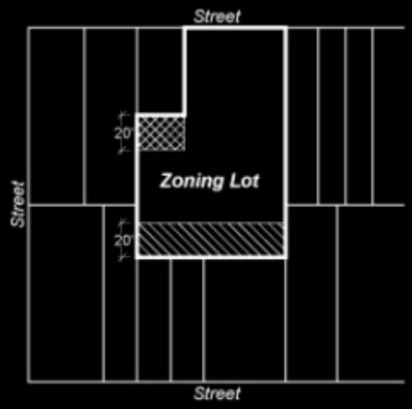

Top Building Types Demolished
Warehouse
Multi-Story Retail
Duplex with Retail or Office
Fireproof Warehouse
Retail Mixed Use
Six Unit Apartment
Church/Synagogue
Three-Family Apartment
Single Story Retail
Unidentified Building Type
Multifamily Residential
Commercial Building
1
100
200
300
400
500
600
700
Number of Buildings Demolished



70% Inside Lots

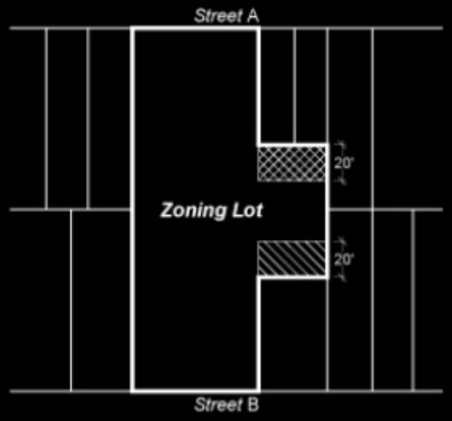
25% Corner Lots

5% Other Lots



Inside Lot

Corner Lot

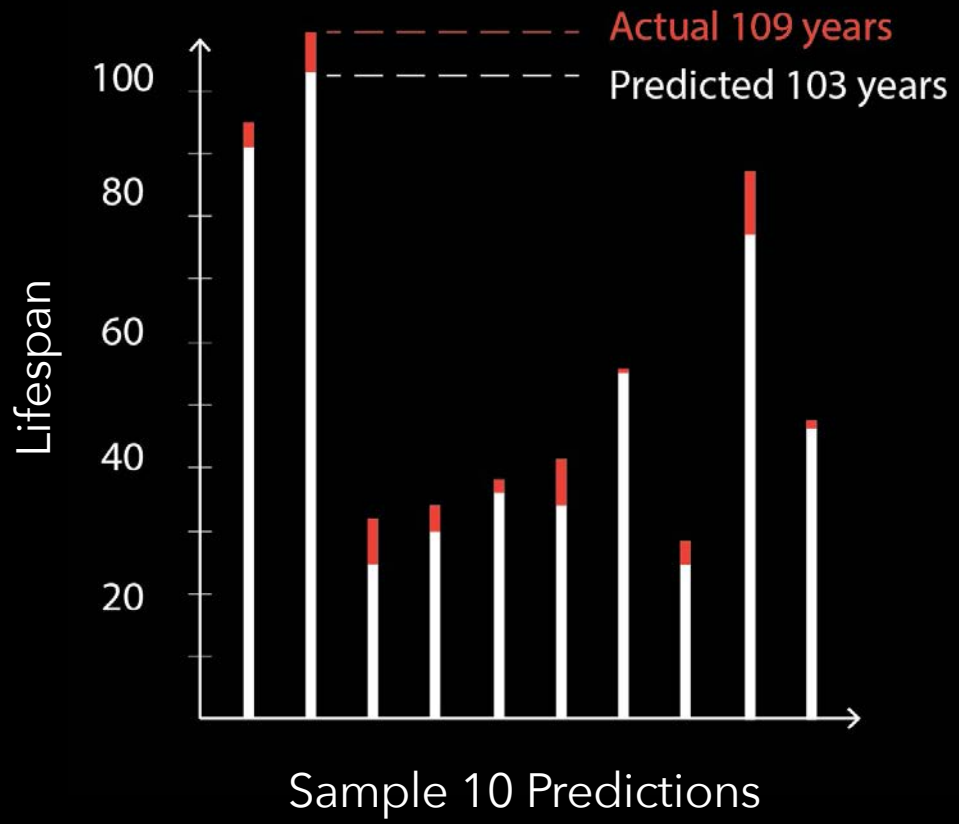


Through Lot

Model Results

RMSE = 7.7

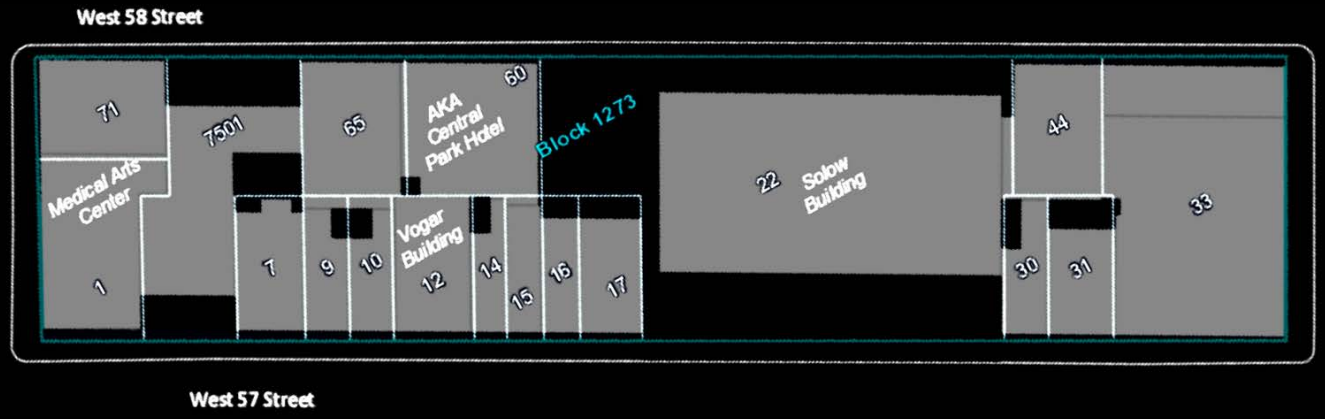
Predictions accurate within ± 8 years



Lofts

Lofts had a longer lifespan than any other building type.

Lot Area



Larger lots cause a slightly positive impact on lifespan.

Frontage

For every 100 ft of frontage, lifespan goes up 2 years.

- frontage **=** lifespan ↓

+ frontage **=** lifespan ↑

Year Built

older = lifespan ↑

Younger = lifespan ↓

For every year younger that a building is, its lifespan will decrease by 1 year.

Future Study

Existing Buildings

Architectural characteristics

Deeper coefficient analysis

Recommendations

Masterplanning:

Plan fewer small lots
Increase Use of overlay zones
Eliminate split-zone lots
Anticipate demos with rising values
Eliminate mixed-ownership properties.

Design:

Prioritize Street Frontage
Design with architectural characteristics of older buildings.
Encourage loft style structures.

Contact Info

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