Real Estate Trends

Presented By:

Haimil Patel
Harsh Patel
Jennie Gandhi
Kahan Shah
Krunal Patel

Outline

Harsh Patel **Jennie Gandhi**	**Retail Sector**
Haimil Patel	**Affordable Housing Initiatives** **Manufacturing Sector**
Krunal Patel Kahan Shah	Real Estate Pricing Model

COLUMBIA|CBIPS
Center for **Buildings, Infrastructure** and **Public Space**

RETAIL SECTOR RESEARCH OUTCOMES

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure** and **Public Space**

Let's take a closer look at the so called Retail Apocalypse of the US

25% of U.S. malls are expected to shut within 5 years. Giving them a new life won't be easy

PUBLISHED THU, AUG 27 2020-9:03 AM EDT | UPDATED THU, AUG 27 2020-9:05 AM EDT

Lauren Thomas
@LAURENTHOMAS

SHARE f 🐦 in ✉

Some Malls Are Fated to Die. Here's What Will Happen to the Rest

In some markets, the dying percentage may be closer to 50%, Moody's says.

By Lynn Pollack | June 28, 2021 at 07:00 AM

Business

Malls are dying. The thriving ones are spending millions to reinvent themselves.

ULTIMATE DEAD MALL GUIDE

OUR TOP PICKS

Dead Malls: A Comprehensive Guide To Abandoned Malls In 2021

March 1, 2021 by Killer Urbex

4

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure** and **Public Space**

# How is the Mall of America doing right now?

- 9 new restaurant tenants
- New retailers opening new stores
- Planning the largest indoor water park of the country in the premises of the mall
- Things are getting better with the footfall as well

COLUMBIA | CBIPS
Center for Buildings, Infrastructure and Public Space

Simon Property Group

- 217 retail properties as of the end of Q-3 2021
- Largest mall operator in USA, based in Indianapolis, Minnesota
- Publicly traded company with the stock price of $167.39 as of day end on 11/8/2021

GLOBAL PROPERTY PORTFOLIO

Malls 99
Premium Outlets 69
International 31
The Mills 14
Lifestyle Centers 4
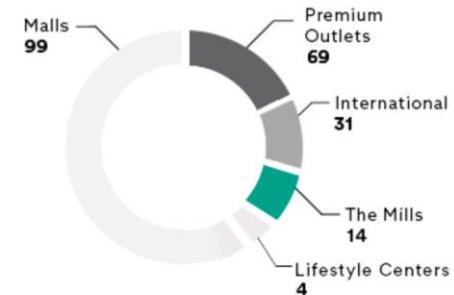
AS OF DECEMBER 31, 2020, WE ALSO OWN AN 80% INTEREST IN THE TAUBMAN REALTY GROUP WHICH OWNS 24 REGIONAL, SUPER-REGIONAL, AND OUTLET MALLS IN THE U.S. AND ASIA.

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure** and **Public Space**

Deep dive inside Simon's performance

- Sales/SF - is increasing, at a slow pace though approximately 4% every year
- Occupancy in 2019 before COVID in 2019 was 95.1% and as of September 30, 2021 it was 92.8%
- Base minimum rent per SF before COVID in 2019 was $54.9 and as of September 30, 2021 it WAS $ 53.91
- Portfolio NOI increased by 18.7% in 2021 compared to 2020.

https://investors.simon.com/node/25841/pdf

COLUMBIA | CBIPS
Center for Buildings, Infrastructure and Public Space

State of malls moving forward:

- People's shopping patterns are changing vigorously
- With online shopping, physical stores act as:

1) A display of any retailer's collection

2) Sort of distribution centre for Buy Online Pickup In Store

3) Customers tend to buy more when they come to return products bought online

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure** and **Public Space**

State of malls moving forward:

- New strategy of mall owners is shifting from operating as well as marketing malls as conventional shopping places to places where people can shop, stay, play, work & live
- Owners are replacing conventional anchor tenants with non traditional anchor tenants like major grocery stores, hotels, residential apartments, entertainment centers

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure and Public Space**

Research Output

- Things don't look as bad as these headlines claim
- There may be severe vacancy in malls but that was due to the overproduction of retail space in the last two decades
- As sales are moving online, the malls that were in low population neighbourhoods have been affected harshly
- It's all about quality & location moving forward

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure** and **Public Space**

Why replacing anchor spaces with warehouses or distribution centers is not the optimal solution?

- Valuation of any real estate:

  Price = Net Operating Income/CAP Rate

  NY/NJ Retail CAP Rate = 6%

  NY/NJ Industrial CAP Rate = 3.25%

CLASS A RETAIL NEIGHBORHOOD/COMMUNITY CENTER CAP RATES (%) STABILIZED

MARKET	H2 2019	H1 2021	CHANGE
Boston	5.50 – 6.50	5.75 – 6.75	▲
Charlotte	5.75 – 6.25	5.60 – 6.25	◄►
NY: Fairfield County, CT	5.75 – 6.25	5.50 – 6.00	▼
NY: N. New Jersey	5.75 – 6.25	5.50 – 6.00	▼
Philadelphia	5.75 – 7.00	6.00 – 7.25	▲
Pittsburgh	6.75 – 7.75	7.00 – 8.00	▲
Raleigh-Durham	-	5.60 – 6.25	
Washington, D.C.	5.25 – 6.00	5.50 – 6.50	▲

CLASS A INDUSTRIAL CAP RATES (%) STABILIZED

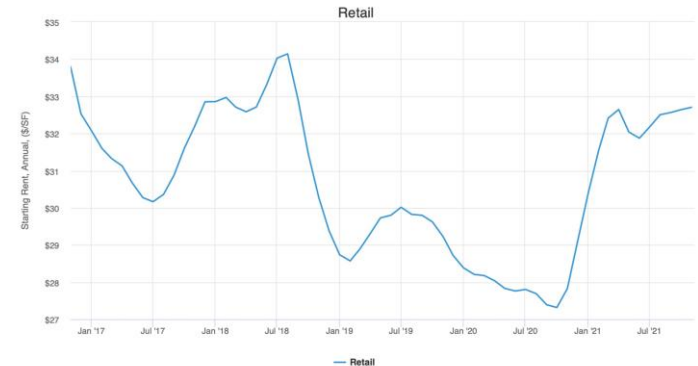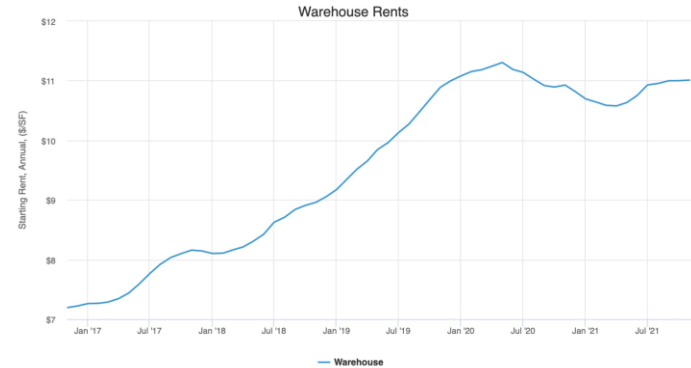| MARKET	H2 2019	H1 2021	CHANGE
NY: N. New Jersey	3.75 – 4.00	2.90 – 3.25	▼
NY: Fairfield County, CT	5.75 – 6.25	4.25 – 4.75	▼
Baltimore	4.50 – 4.65	4.00 – 4.40	▼
Boston	4.75 – 5.25	3.00 – 3.35	▼
PA I-78/81 Corridor	4.25 – 5.00	3.75 – 4.10	▼
Philadelphia	4.50 – 5.00	3.00 – 3.35	▼
Washington, D.C.	4.50 – 4.65	4.00 – 4.40	▼
Charlotte	4.90 – 5.25	3.75 – 4.25	▼
Pittsburgh	5.00 – 5.75	4.00 – 4.50	▼
Raleigh-Durham	5.50 – 6.00	3.75 – 4.25	▼

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure and Public Space**

Why replacing anchor spaces with warehouses or distribution centers is not the optimal solution?

- Warehouse rent as of November 2021 $12/SF
- Retail rent as of November 2021 $32/SF

Warehouse Rents

Retail

https://enterprise.compstak.com/analytics

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure and Public Space**

Why replacing anchor spaces with warehouses or distribution centers is not the optimal solution?

- Assume a space of 1000 SF
- Valuation according to retail owner: $533,333
- Valuation according to warehouse investor: $200,000
- This wide gap is a result why we don't see the talks of major retailers like amazon, target and others don't workout with the mall owners
- This will only work if the property is severely distressed, entirely vacant or ends up into a foreclosure

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure and Public Space**

Pandemic Hit to Retail Stores

- When the pandemic gripped New York City, it propelled an enormous surge in online shopping that has not waned, even in a metropolis where stores are rarely far away.
- Amazon has spent the pandemic embarking on a warehouse shopping spree in New York, significantly expanding its footprint in the biggest and most lucrative market in the country.
- It has snatched up at least nine new warehouses in the city, including a 1 million-plus square foot behemoth rising in Queens that will be its largest in New York, and today has at least 12 warehouses in the five boroughs and it has added to its roster more than two dozen warehouses in suburbs surrounding the city.

14

COLUMBIA | CBIPS
Center for Buildings, Infrastructure and Public Space

Amazon Bronx Warehouse

COLUMBIA | CBIPS
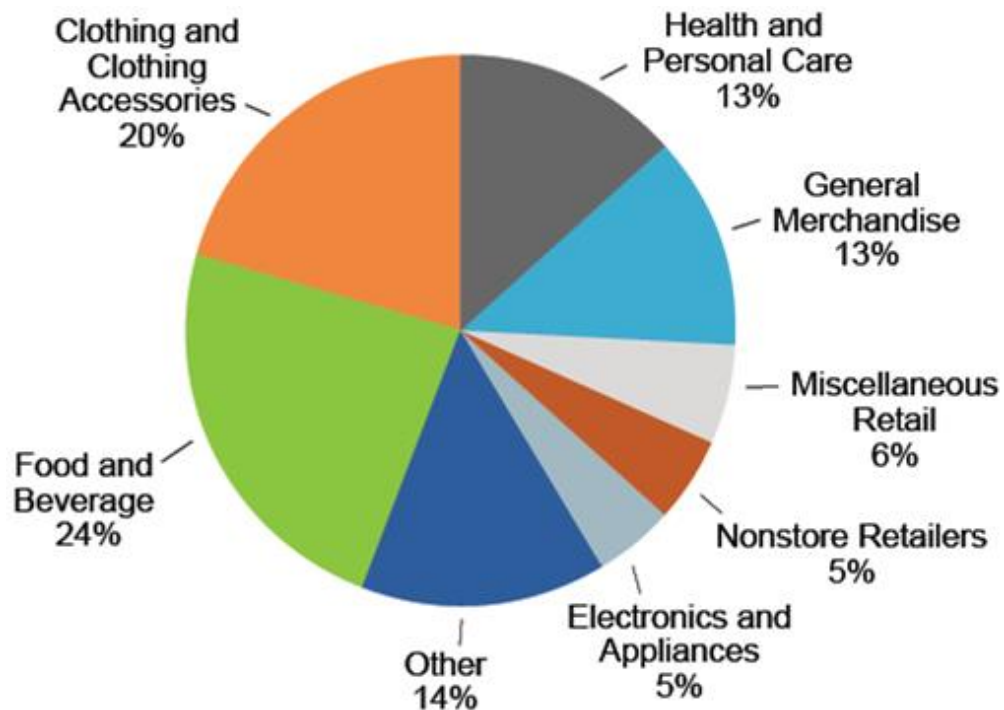Center for **Buildings, Infrastructure** and **Public Space**

Highlights to Retail Stores

- In 2019, New York City's retail sector comprised 32,600 businesses that provided 344,600 jobs, paid $16 billion in total wages citywide, and contributed $55 billion in taxable sales to the City's economy.
- Taxable sales in retail trade declined by nearly one-third from March to May 2020 compared to one year earlier, with all subsectors posting declines except, notably, nonstore retailers.
- Nonstore retailers, including online retailers, have experienced the most growth in taxable sales of any sub sector during the pandemic. Nonstore retailers' 10-year trend of pre-pandemic job growth exceeded 110 percent.
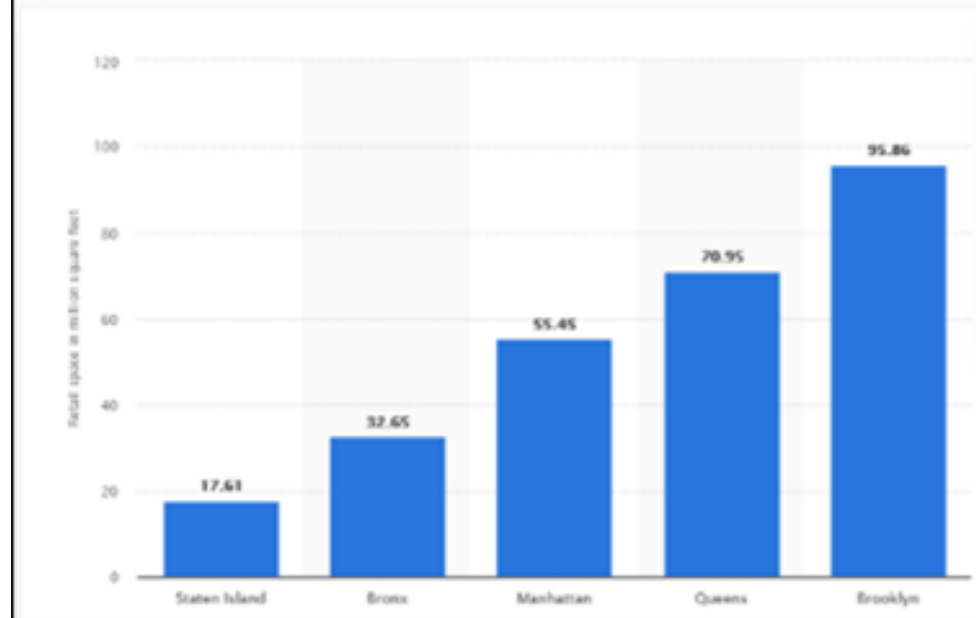
COLUMBIA | CBIPS
Center for **Buildings, Infrastructure and Public Space**

Sub- Sector Shares of NYC Retail Employment–2019

Clothing and Clothing Accessories 20%

Health and Personal Care 13%

General Merchandise 13%

Miscellaneous Retail 6%

Nonstore Retailers 5%

Electronics and Appliances 5%

Other 14%

Food and Beverage 24%

COLUMBIA | CBIPS
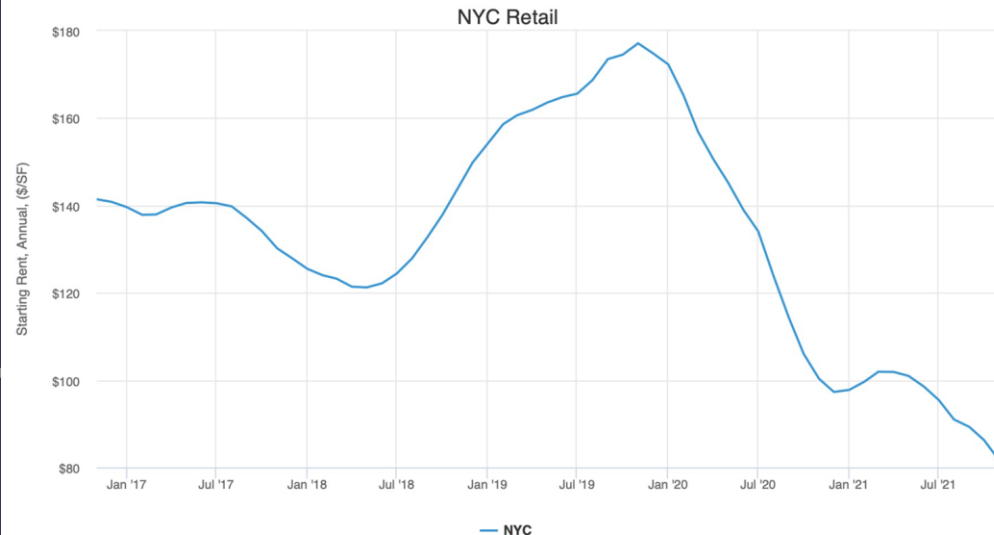Center for Buildings, Infrastructure and Public Space

Total Retail Space in NYC in 2019

- Brooklyn- 95.86

- Queens- 70.95

- Manhattan- 55.4

- Bronx- 32.65

- Staten Islands- 17.61

(in million square feet)

COLUMBIA | CBIPS
Center for **Buildings**, **Infrastructure** and **Public Space**

Price Per Square Feet for NYC Retail

NYC Retail

https://enterprise.compstak.com/analytics

COLUMBIA | CBIPS
Center for Buildings, Infrastructure and Public Space

Percentage of Unoccupied Store Fronts Summer 2021

Percentage of Unoccupied Storefronts
Summer 2021

Category	Percentage
Office-Dependent (Grand Central & Midtown East)	29.9%
High Street (Madison Avenue)	28.4%
Manhattan Residential (Upper East Side)	20.9%
Brooklyn Residential (Greenpoint & Prospect Heights)	14.6%
Queens Residential (Astoria & Sunnyside)	14.0%

COLUMBIA | CBIPS
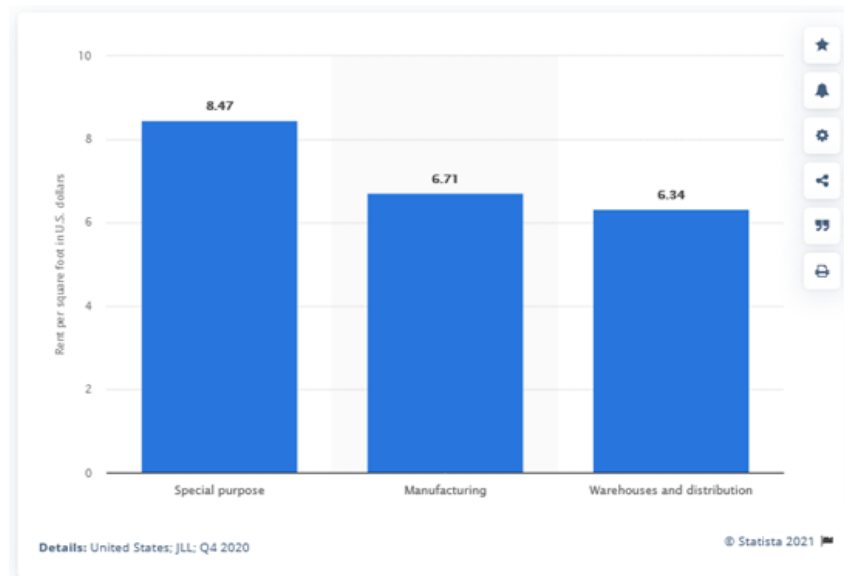Center for **Buildings, Infrastructure** and **Public Space**

Office Vacancy Rates

- Office vacancy rates in the United States from 2nd quarter 2019 to 3rd quarter 2021.
- There were many permanent closures, and retail vacancy rates hit an average of 20 percent in the second quarter of 2020.

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure** and **Public Space**
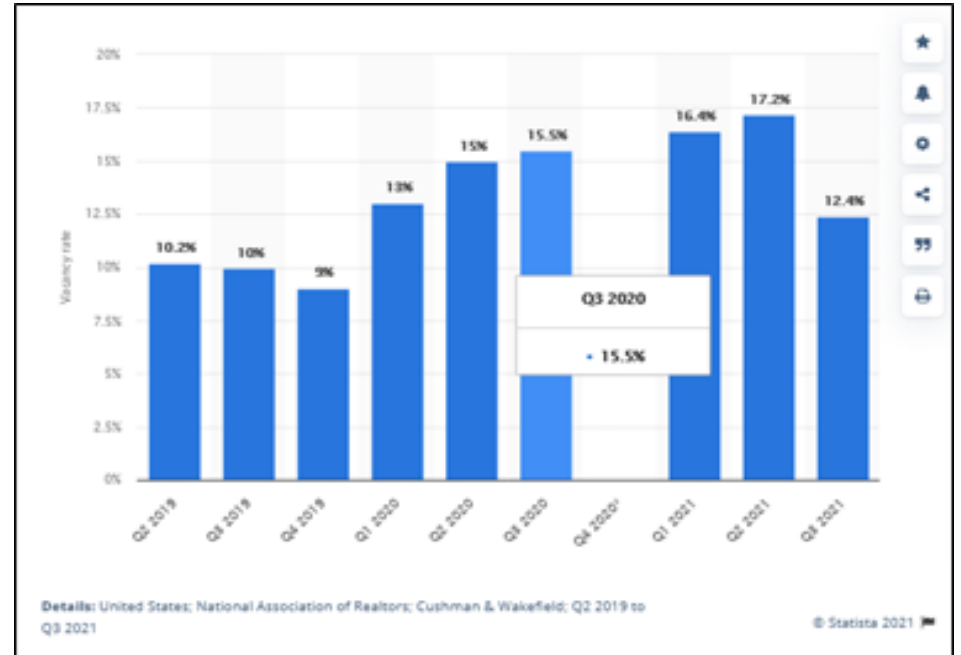
Average Rent Per Square Foot

- The average rent for special purpose industrial space was 8.47 U.S. dollars per square foot in that quarter.
- Average rental rates in major U.S. metros for office spaces are much higher than those for industrial spaces.
- This is most likely because office units are generally located in urban areas where there is limited space and thus higher demand, whereas industrial units are more suited to the outskirts of such urban areas.
- Warehouses and distribution may currently command the lowest average rent per square foot among industrial space types, but this looks set to change in the future.

Details: United States; JLL; Q4 2020

© Statista 2021

- https://www.statista.com/statistics/626555/average-rent-per-square-foot-paid-for-industrial-space-usa-by-type/
- https://www.cnbc.com/2021/10/07/midtown-manhattan-reels-from-the-highest-retail-vacancies-in-nyc.html

COLUMBIA | CBIPS
Center for Buildings, Infrastructure and Public Space

A LOOK INTO MANUFACTURING SECTOR

Manufacturing Sector (overview)

"$1 billion in incremental e-commerce sales generates 1.25 million sq. ft. of warehouse space demand"
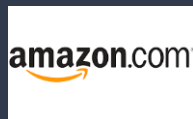
Finding of CBRE Research into Manufacturing Sector

- Year-over-year e-commerce growth surged to **44.5%** in Q2 from **14.8%** in Q1 (2021)
- Pressure on retailers, wholesalers and third-party logistics companies (3PLs) to reach consumers while lowering transportation costs

Net Absorption (previous five-year annual average)	Net Absorption (2021)
250 million SF	211 million SF

COLUMBIA | CBIPS
Center for Buildings, Infrastructure and Public Space

Future Speculations in Manufacturing

"Many companies are utilizing a "China-plus-one" strategy to diversify product sourcing and limit any supply chain disruptions related to COVID-19"

"The Southwest and Southeast U.S. will have the highest rates of population growth over the next five years. The Southwest and Southeast U.S. will have the highest rates of population growth over the next five years."

- CBRE Market Analysis

- Increase in online shopping: Acceleration in retail-to-industrial conversion projects
- Challenges to be addressed: **oversupply, conversions in residential areas**
- **Strong Demand in infill warehouse space**
- **Adaptive reuse of retail buildings for industrial occupiers will accelerate**

New Industrial Completions   ⬆   **29%**

(According to CBRE Econometric Advisors)

Prime Focus: Inventory Control for Industrial occupiers Increase in footprints to store **"Safety Stock"**
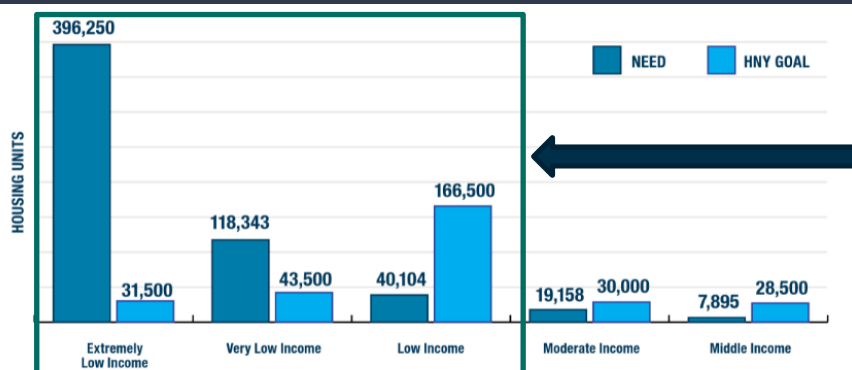
Challenges: Potential Supply Chain Disruptions

AFFORDABLE HOUSING RESEARCH OUTCOMES

Housing New York Goals

"THE MAYOR'S PRIMARY HOUSING PLAN"
NOT DESIGNED TO MEET THE NEEDS OF THOSE
WITH THE MOST SEVERE RENT BURDENS"

High Disparity in the needs and the HNY Goals

Housing Need vs Housing NY 2.0

COLUMBIA|CBIPS
Center for **Buildings, Infrastructure and Public Space**
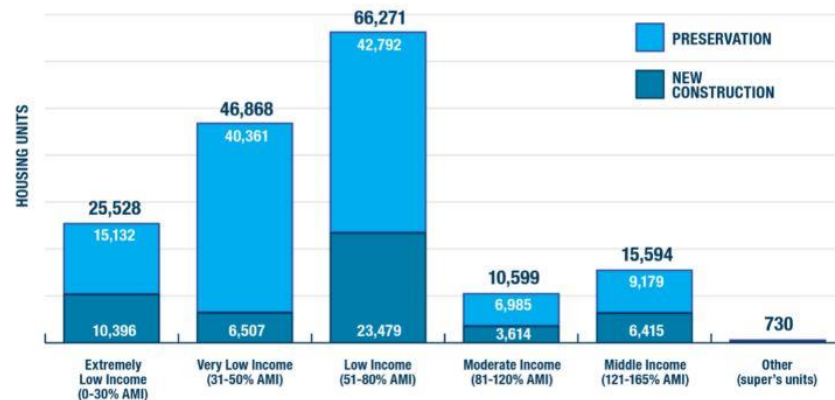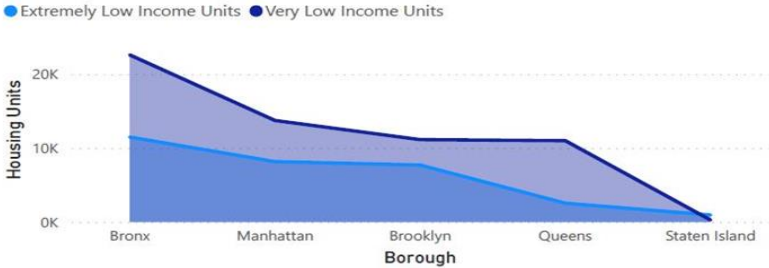
Affordable Housing (continued analysis)

Dept of Housing Preservation and Development (HPD)

All Counted Units (Low and very Low) by Borough

Extremely Low Income Units and Very Low Income Units by Borough

Power BI Visual

194K
All Counted Units

Extremely Low Income Units by Borough
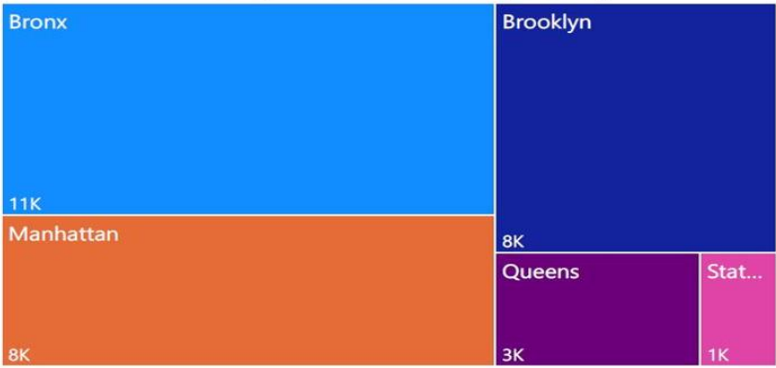
The data visualized here represents building units, and projects that began after January 1, 2014, and are counted towards the Housing New York Plan

COLUMBIA | CBIPS
Center for Buildings, Infrastructure and Public Space

Looking into the future of Affordable Housing
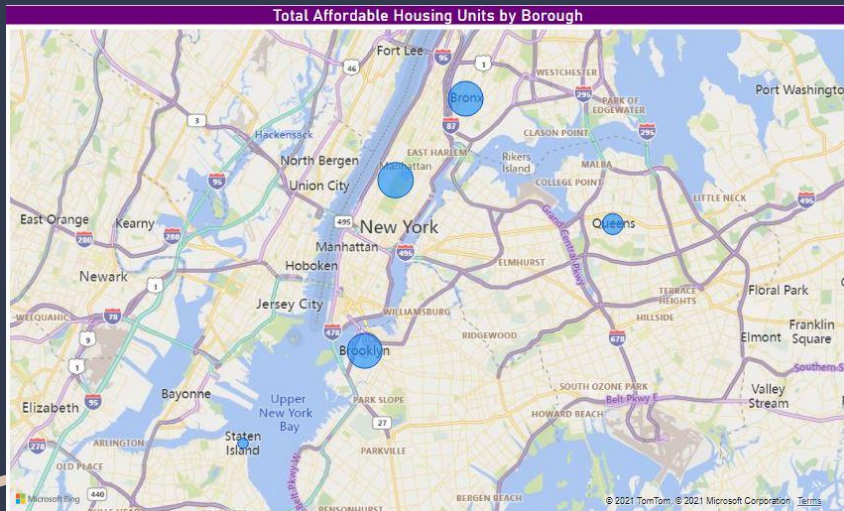
Power BI Visual

Recommendations for the future Administration

POLICY

- The next administration must develop an approach to housing production and preservation that directly confronts and explicitly addresses the destructive practices of speculation and segregation, and ensures all New Yorkers have safe and healthy housing

LEVEL OF EFFORT

- More development efforts required in the Staten Island and Queens borough: provides market opportunities in Affordable Housing

Real Estate Property Pricing Model

Kahan Shah; Krunal Patel

Dr. Feniosky Pena-Mora; Prof. Rick Bell

Contents

- Introduction – Real Estate & Real Estate Pricing

- Literature Review – Factors affecting Real Estate Value

- Classification – Factors affecting Real Estate Value

- Opinion Survey – Factors affecting Real Estate Value

- Final Factors & Classification

- Literature Review – Property Pricing

- Real Estate Property Pricing Model

- Model Validation

- Conclusion & Limitations

- Further Scope

Contents

- Introduction – Real Estate & Real Estate Pricing

- Literature Review – Factors affecting Real Estate Value

- Classification – Factors affecting Real Estate Value

- Opinion Survey – Factors affecting Real Estate Value

- Final Factors & Classification

- Literature Review – Property Pricing

- Real Estate Property Pricing Model

- Model Validation

- Conclusion & Limitations

- Further Scope

Introduction – Real Estate & Real Estate Pricing

- This chapter gives an overall background of real estate projects, the need for study, the objective and defines the scope of work

What is real estate?

▪ Real estate is the land along with any permanent improvements attached to the land, whether natural or man-made – including water, trees, minerals, buildings, homes, fences, and bridges.

▪ Real estate includes the physical surface of the land, what lies above and below it, what is permanently attached to it, plus all the rights of ownership—including the right to possess, sell, lease, and enjoy the land

34

What does real estate comprise of?

```
                    ┌─────────────┐
                    │ Real Estate │
                    └─────────────┘
   ┌──────────┬──────────┬──────────┬──────────┬──────────┐
┌────────────┐┌────────────┐┌────────────┐┌────────────┐┌────────────┐┌────────────┐
│Agricultural││Residential ││Commercial  ││ Industrial ││ Mixed Use  ││Special Use │
└────────────┘└────────────┘└────────────┘└────────────┘└────────────┘└────────────┘
```

35

What does real estate comprise of?

Real Estate

Agricultural | Residential | Commercial | Industrial | Mixed Use | Special Use
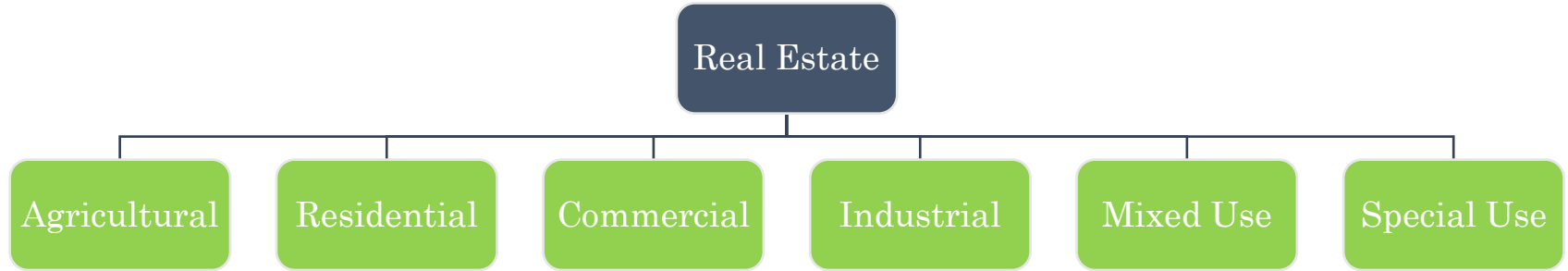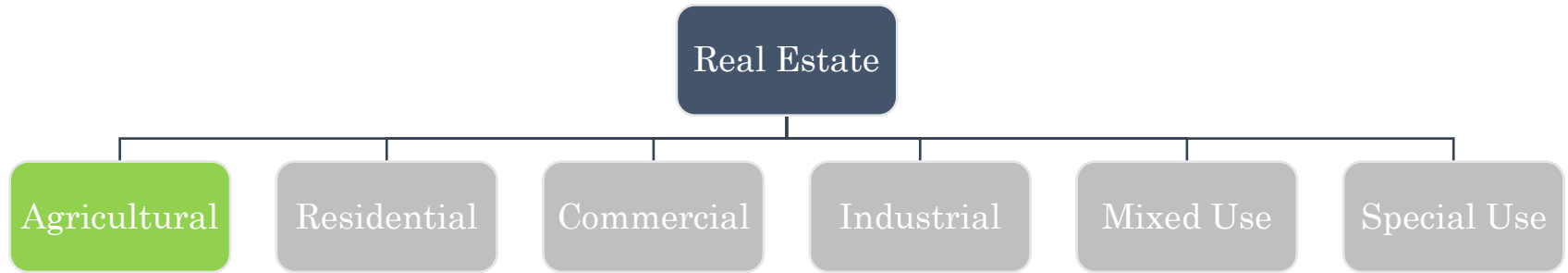
Agriculture is using the land to provide crops, raise animals and plants.

Farms

Ranches

Timberland

36

What does real estate comprise of?

```
                          Real Estate
    ┌──────────┬──────────┬───┴──────┬──────────┬──────────┐
Agricultural  Residential  Commercial  Industrial  Mixed Use  Special Use
```
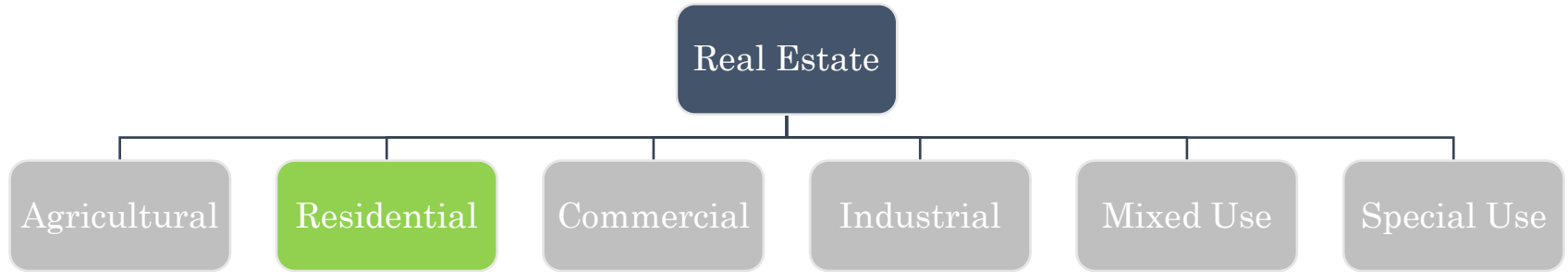
Residential have houses built on the land with basic site development.

Single Family Homes

Apartments

Cooperatives

37

What does real estate comprise of?

```
                          Real Estate
   ┌──────────┬──────────┬──────────┬──────────┬──────────┐
Agricultural  Residential  Commercial  Industrial  Mixed Use  Special Use
```
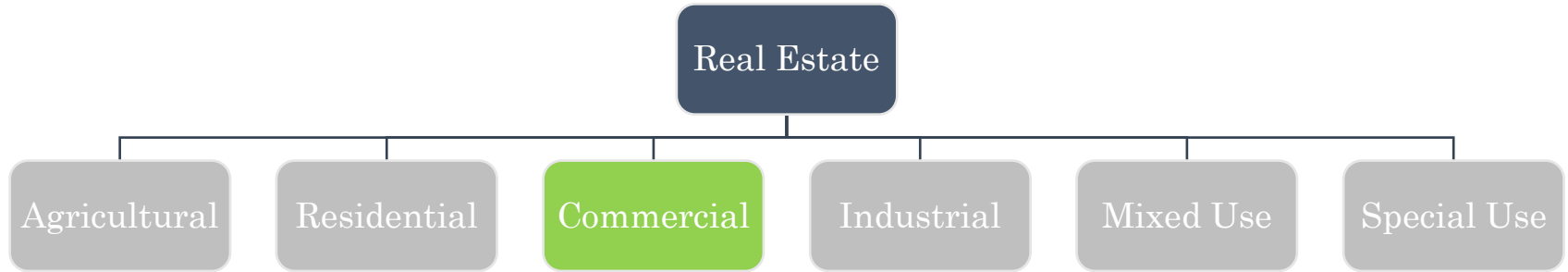
Commercial property will include property that contains business activity

Office Spaces

Hotels

Stores

What does real estate comprise of?

```
                          ┌─────────────┐
                          │ Real Estate │
                          └─────────────┘
   ┌──────────┬──────────┬──────────┬──────────┬──────────┬──────────┐
Agricultural  Residential Commercial  Industrial  Mixed Use  Special Use
```
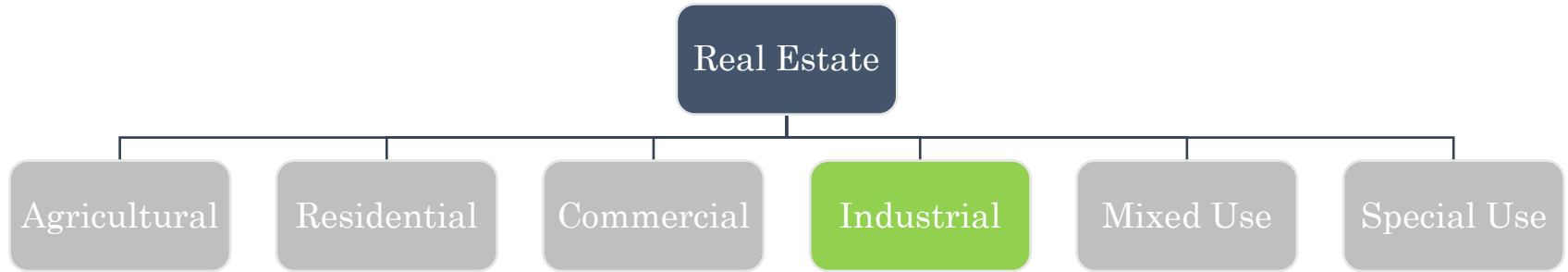
Industrial includes buildings used for manufacturing or storing purposes

Warehouses

Power Plants

Factories

What does real estate comprise of?

```
                        ┌─────────────┐
                        │ Real Estate │
                        └─────────────┘
   ┌──────────┬──────────┬──────────┬──────────┬──────────┐
```

| Agricultural | Residential | Commercial | Industrial | Mixed Use | Special Use |
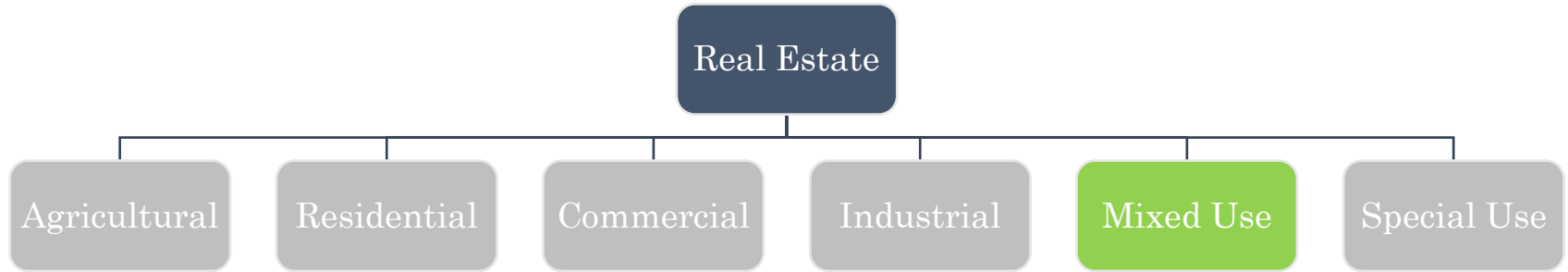
Mixed use are generally residential plus commercial

Retail + residential

40

What does real estate comprise of?

```
                          ┌─────────────┐
                          │ Real Estate │
                          └─────────────┘
```

Agricultural	Residential	Commercial	Industrial	Mixed Use	Special Use
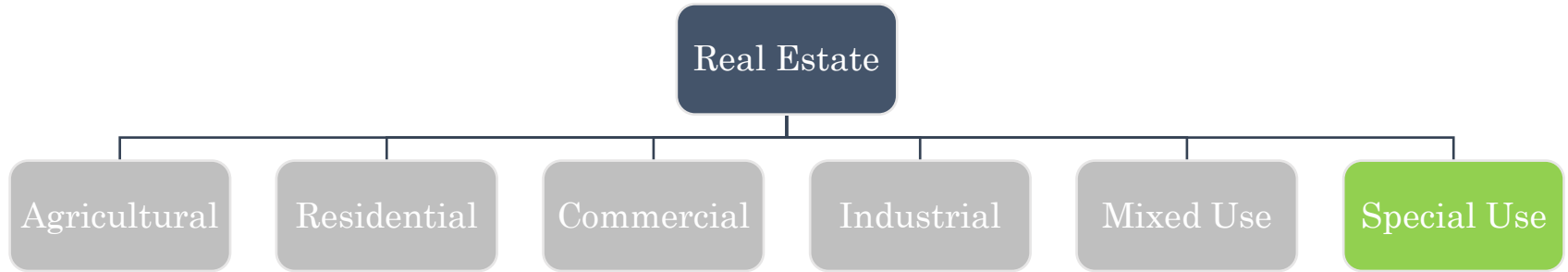
Special use property are usually publicly held property

Religious places

Government buildings

Parks

41

How is real estate property priced?

- Unfortunately, there is **no** easy or universal way to determine market value for real estate. However, nearly every market valuation comes down to two factors: **real estate appraisals** and **recent comparable sales.**

Real estate appraisals	Recent comparable sales
• An appraisal is a professional opinion of value. • During a home sale, the bank that offers the home loan will typically select an appraiser to render an opinion about the value of real estate as of a specific date. • In other words, Valuation. • Considering Size, Materials, External features, Location, etc.	• The recent sales of properties of similar stature are reviewed to inform judgment. • Also known as market data approach.

Need for study

- Real estate property prices, as discussed in the previous slide, are not easy to determine. There is no universal way or thumb rules to calculate the prices. Real Estate Industry is an open market, and it totally dependent upon the buyer and seller.

- As there is no singular way to determine the property prices, the prices are determined commonly by recent comparable sales. However, it is not safe to assume that the property price based on other property sales.

- There are innumerable factors driving the property price and they are not easily identifiable.

- A similar property might go on to be a successful at a certain price, but it is not the same for other similar properties.

- There is a potential risk that the project if priced inappropriately will fail and all the other consequences related to it.

- Therefore, it is important to determine the price of the property which resonates with the market and yields the results the project is intended for.

Source: Bloomberg

43

10

Objective

- To develop a Real Estate Property Pricing Model which indicates prices of the properties located in New York City.

- To determine the factors that influences real estate prices.

- To apply the concepts of data generated models in the real estate pricing methodology.

Research Questions

- What is the price of a property which would yield optimum results i.e., timely completion of sales and desired ROI?

44

Scope of Work

Scope of Work

Literature Review I – Factors affecting real estate value	→	Opinion Survey – Factors affecting real estate value	→	Finalization & Categorization of Factors	→	Literature Review II – Real estate pricing model

↓

Further Scope	←	Concluding the Research	←	Data Collection & Analysis	←	Reviewing and Selecting Model

Literature Review – Factors affecting Real Estate Value

- The aim of literature study is to determine the factors having impact on real estate residential projects.

Process

| **Identification of Sources** | → | **Literature Review** | → | **Finding the Factors** | → | **Categorizing the Factors** |

- Research Papers
- Thesis
- Articles & Newspapers

- Research of the similar literature focusing on the factors affecting real estate value.

- 43 such factors were found out by extensive literature review.

- 43 factors categorized into 4 groups:
- Physical
- Social
- Economic
- Legal

48

Influence Factors and Evaluation of Real Estate Development Project
Fengzhou ZHANG, Shengyue HAO, Xu REN and Wenhua LI

Purpose	Methodology	Findings	Inferences
▪ Identifying-Structuring-Grading the influencing factors of real estate projects to help developers make an informed decision on investment.	▪ Extensive Literature study was conducted, and the authors found 29 influencing factors related to real-estate development projects (enterprise scale, population employment structure etc.) ▪ Grouped them into three facets: Internal – Real Estate enterprise; Internal – Real Estate Project & External Factors ▪ Quantifying the factors and obtaining a project score by using the expert grading method.	▪ The influencing factors were quantified by experts using the expert grading method. ▪ The project score obtained through this method gives an understanding of positive or negative effect of influencing factors. ▪ These positive and negative effects indicates the project performance.	▪ Identifying the influencing factors affecting the real estate development projects through literature study ▪ 29 factors from three different facets: Internal – Real Estate enterprise; Internal – Real Estate Project & External Factors and knowing about them and their importance. ▪ Using expert grading method to quantify the factors and to obtain a project score

Assessing Real Estate Project Success Using an Analytic Network Process
Didem Erdem and Beliz Ozorhon

Purpose	Methodology	Findings	Inferences
▪ To propose a comprehensive success model for real estate projects using the Analytic Network Process (ANP)	▪ A wide range of success factors were identified through Literature Study and were classified into four groups (financial, customer, value adding, and operational) according to the balanced scorecard (BSC) framework. ▪ ANP includes model construction, pairwise comparison of interrelated variables, and calculation of importance weights of the model attributes assigned by 8 experts. ▪ Finally, it is tested on 9 completed projects to compare the success values with the real ones	▪ Project location, contribution to business value, accuracy of cost estimation, level of innovativeness of the project, and effectiveness of cost control are the most important factors of success in real estate projects. ▪ The operational perspective, however, is not found to be as effective as the other three perspectives ▪ When tested with 9 completed projects the results were satisfactory.	▪ 23 critical factors affecting the success of a projects, their classification and their importance as per the research work. ▪ Balanced scorecard (BSC) framework and ANP process. ▪ ANP process shortcomings – less no. of experts, may lead to impractical assessment

Analysis on Real Estate Price Influence Factors in China Based on the Multivariate Linear Regression Model | Tiantian Li and Pengyan Li

Purpose	Methodology	Findings	Inferences
▪ To identify and analyze influencing factors to provide an insight on methods that can be used to stabilize prices.	▪ A wide range of factors were identified through Literature Study. ▪ A Real Estate pricing model is established using the characteristics of Multivariate Linear Regression Model ▪ The model suggest the most important factors that affect the real estate prices.	▪ Commercial house sales, link to urbanization and use of foreign investments emerged as the most prominent factors affecting the prices of real estate.	▪ Influencing factors affecting the prices of real estate projects determined from literature review. ▪ Multivariate Linear Regression Model used to establish real estate pricing model. ▪ Pricing Model gives three major factors: Commercial house sales, link to urbanization and use of foreign investments

Empirical Analysis of Influencing Factors of Real Estate Development: A Case Study of Harbin | Qun Cao

Purpose	Methodology	Findings	Inferences
▪ To identify and analyze influencing factors on real estate projects.	▪ A range of influencing factors were identified through Literature Study. ▪ Unitary regression model was used to analyze the influencing factors.	▪ Positive correlation between the real estate industry and 6 factors: • Urbanization level • Industrialization level • Economic, development level • Degree of regional development • Housing consumption demand level • Government investment expenditure	▪ Influencing factors affecting the real estate projects were determined from literature review. ▪ Multiple Regression Model used to establish real estate model to analyze the impacts of various factors on real estate projects. ▪ Positive correlation was obtained between real estate industry and 6 factors.

A Grey Relational Analysis on Factors Affecting the Price of Commercial Housing
Yepeng HU and Pengyan LI

Purpose	Methodology	Findings	Inferences
▪ To identify and analyze various factors affecting the commercial housing prices	▪ A range of influencing factors were identified through Literature Study. ▪ Unitary regression model was used to analyze the influencing factors.	▪ Positive correlation between the real estate industry and 6 factors: • Urbanization level • Industrialization level • Economic, development level • Degree of regional development • Housing consumption demand level • Government investment expenditure	▪ Influencing factors affecting the real estate projects were determined from literature review. ▪ Multiple Regression Model used to establish real estate model to analyze the impacts of various factors on real estate projects. ▪ Positive correlation was obtained between real estate industry and 6 factors.

53

Hedonic valuation of apartments in Kenya
Raphael Mutisya Kieti and Walter Ogolla

Purpose	Methodology	Findings	Inferences
▪ To identify critical determinants of apartment value using the hedonic pricing model (HPM) approach and develop a valuation model that can accurately estimate the value of apartments.	▪ The research employed a case study design that was limited to transaction sales and attribute data of apartments ▪ A sample of 120 sales of apartments obtained from registered real estate firms was analyzed using quantitative methods.	▪ The hedonic valuation model developed comprises four critical determinants of apartment value: number of parking lots, presence of swimming pool, age of apartment and provision of balcony.	▪ Identifies factors through Literature Study and case studies. ▪ Hedonic Pricing model is used to analyze impacts of factors on real estate property pricing. ▪ HPM method give 4 critical factors which impacts the real estate property pricing. ▪ Model can estimate apartment values.

54

Critical factors determining rental value of residential property in Ibadan metropolis, Nigeria | Oluseyi Joshua Adegoke

Purpose	Methodology	Findings	Inferences
▪ To identify critical factors having impact on value of residential property	▪ 624 random residential properties were selected, and data was collected ▪ Hedonic Pricing model was used to analyze the data collected and to identify critical factors.	▪ The hedonic valuation model developed comprises four critical determinants of apartment value: number of parking lots, presence of swimming pool, age of apartment and provision of balcony.	▪ Identifies factors through Literature Study and case studies. ▪ Hedonic Pricing model is used to analyze impacts of factors on real estate property pricing. ▪ HPM method give 4 critical factors which impacts the real estate property pricing. ▪ Model can estimate apartment values.

Other research works
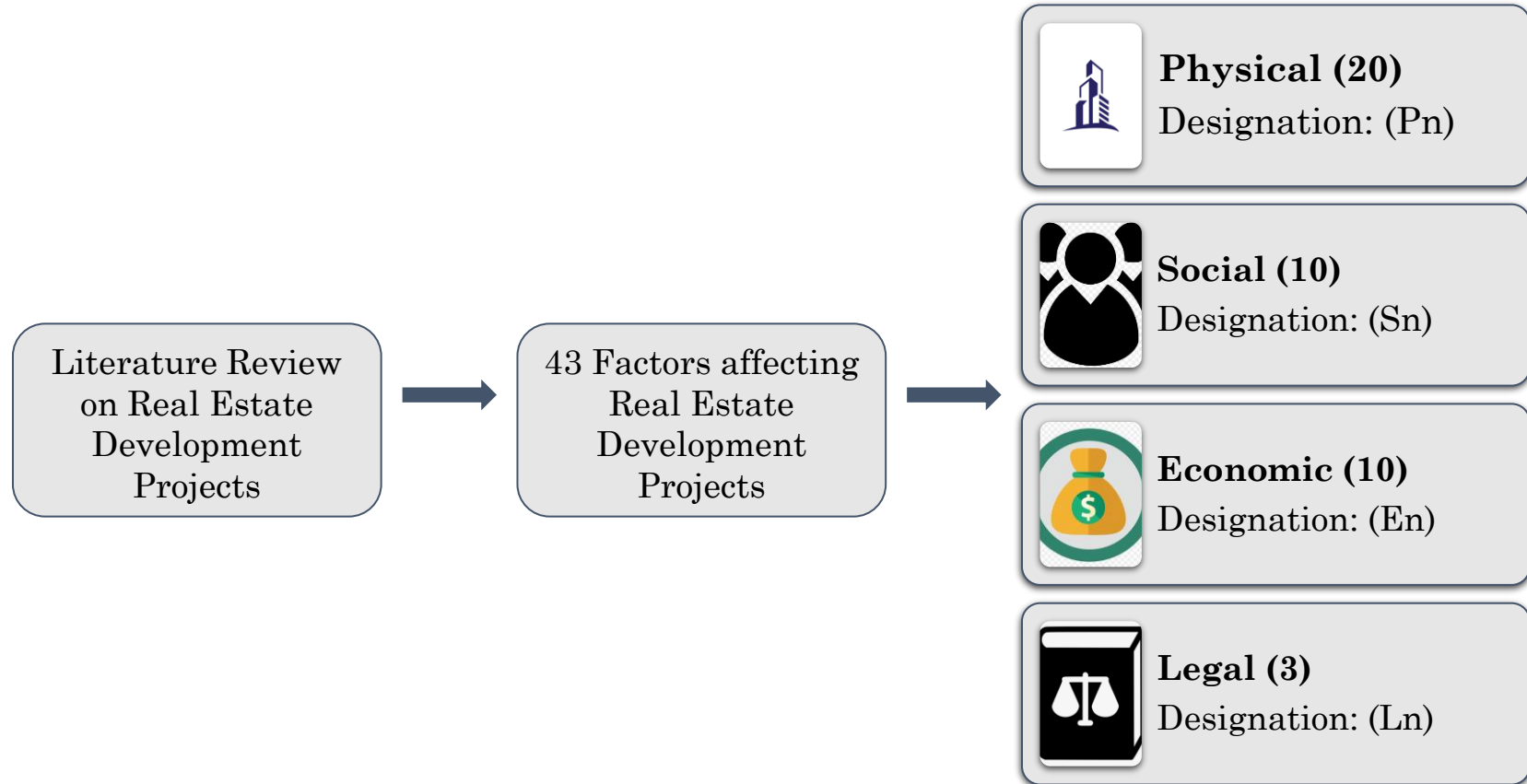
- List of other research papers reviewed for factors affecting the real estate property value:

Sr. No.	Research Title
1	Su, X.M. (2006). "Discuss the critical success factors of the project." Science and Management, 05, 10-11.
2	Xu, S.S. (2011) "The key study of real estate development project success." Manager' Journal, 08, 2-3.
3	Chan, A. P. C., Scott, D., and Chan, A. P. L. (2004). "Factors affecting the success of a construction project." J. Construct. Eng. Manage.
4	Chen, Z., and Khumpaisal, S. (2009). "An analytic network process for risks assessment in commercial real estate development." J. Property Invest.
5	Chua, D. K. H., Kog, Y. C., and Loh, P. K. (1999). "Critical success factors for different project objectives." J. Construct. Eng. Manage.
6	Cooke-Davies, T. (2002). "The "real" success factors on projects." Int. J. Proj. Manage.
7	Jing-min, N., Lechler, T. G., and Jun-long, J. (2010). "Success criteria framework for real estate project." Manage. Sci. Eng.
8	Gholamreza, Z. (2015). "The economical factors affecting residential property price: the case of Penang Island." International Journal of Economics and Finance,
9	Guo, S.N. (2013). "Analysis on real estate price increasing factors based on multivariate regression model-data from 2002 to 2009 as example." Guide to Business
10	Wang, W.J. (2015). "Research and empirical analysis on commercial house price influence factors in China." Technology and Enterprise

Classification – Factors affecting Real Estate Value

- The aim of literature study is to determine the factors having impact on real estate residential projects.

Literature Findings

Literature Review on Real Estate Development Projects

→

43 Factors affecting Real Estate Development Projects

→

Physical (20)
Designation: (Pn)

Social (10)
Designation: (Sn)

Economic (10)
Designation: (En)

Legal (3)
Designation: (Ln)

58

Literature Review – Findings

No.	Physical Factors
1	Location
2	Features
3	Architectural Design
4	Construction Quality
5	Amenities
6	Parking
7	Lift
8	Age of building
9	Neighbourhood
10	View
11	Floor Level
12	Outdoor Air Quality
13	Indoor Air Quality
14	Water Quality
15	Traffic
16	Accessible degree of road
17	urban transport
18	Noise Levels
19	HVAC Systems
20	Access to public infrastructure

1. **Location**: It can be defined as a place where the building is situated. Location should be thought in terms of the locality, proximity to key city locations, accessibility to different transport mediums etc.

2. **Features**: Features include size of unit, no. of rooms, etc.

3. **Architectural Design**: The architectural design of the project. It should be thought in terms of the likability for a customer.

4. **Construction Quality**: The quality of construction has an impact on the sell ability of project

5. **Amenities**:Amenities includes common spaces, board rooms, swimming pools etc.

6. **Parking**: Parking availability for the buyer.

7. **Lift**: Lift system is important in any building exceeding three floors. Purchaser of the property decision will depend upon the availability of lift

8. **Age of building**: Buyer who is investing their money will think about the life of the project. One would not like to move into a place which is nearing their design life which also has higher maintenance cost.

Literature Review – Findings

No.	Physical Factors
1	Location
2	Features
3	Architectural Design
4	Construction Quality
5	Amenities
6	Parking
7	Lift
8	Age of building
9	Neighbourhood
10	View
11	Floor Level
12	Outdoor Air Quality
13	Indoor Air Quality
14	Water Quality
15	Traffic
16	Accessible degree of road
17	urban transport
18	Noise Levels
19	HVAC Systems
20	Access to public infrastructure

9. **Neighbourhood**: the community of people living surrounding the project area have an impact on the buyers. People will prefer places which are safe and human friendly.

10. **View**: The exterior view from the property is a big selling point for the developers. Buyers would prefer having scenic and serene views from their houses/apartments and will be willing to pay higher cost

11. **Floor Level**: The level at which the property is located. Buyer can prefer living on the ground floor if there is no lift accessibility and can also prefer top floors to have scenic views around the neighbourhood

12. **Outdoor Air Quality**: The outdoor air quality is directly dependent upon the traffic and nearby located industries. Buyers would prefer to have a healthy level of outdoor air quality

13. **Indoor Air Quality**: The Indoor air quality is one of the major points which buyers consider. It directly affects their health and well being.

14. **Water Quality**: The quality of water available to the project directly affects the health of the resident. Hence, it is of great importance

15. **Traffic**: Traffic is the no. of vehicles operating in the surrounding neighbourhood. It is directly proportional air pollution, noise pollution, mental health etc.

Literature Review – Findings

No.	Physical Factors
1	Location
2	Features
3	Architectural Design
4	Construction Quality
5	Amenities
6	Parking
7	Lift
8	Age of building
9	Neighbourhood
10	View
11	Floor Level
12	Outdoor Air Quality
13	Indoor Air Quality
14	Water Quality
15	Traffic
16	Accessible degree of road
17	urban transport
18	Noise Levels
19	HVAC Systems
20	Access to public infrastructure

16. **Accessible degree of road**: Accessibility of the roads from the property. Higher the accessibility higher the convenience and higher the price

17. **Urban transport**: Connectivity of the property to the urabn transport system like public buses, metro trains, trams etc.

18. **Noise Levels**: Noise levels in the neighbourhood could affect the value of property. People would not prefer such localities where noise levels are high.

19. **HVAC Systems**: The heating, cooling & ventilation systems of the property are a major factor. People would prefer operational HVAC systems with lower maintenance and energy efficient.

20. **Access to public infrastructure**: Public infrastructure includes the parks, street ways, restuarants, hospitals, schools etc.

Literature Review – Findings

No.	Economic Factors
1	Market Condition
2	Tax system
3	Land cost
4	population employment structure
5	population size and density
6	population age structure
7	GDP
8	Sales of similar houses
9	Maintenance Cost
10	Property Appraisal

1. **Market Condition**: The current market condition influence the property prices in an appreciating or depreciating ways.

2. **Tax system**: The property taxing system affects the buyer decision of buying the property.

3. **Land cost**: The land cost has an effect on the real estate property value

4. **population employment structure**: The employment of potential buyers determines the property prices.

5. **population size and density**: The population size and density influences buyers' decision of whether to buy the property. It can be a buyer's choice to live in a densely populated area or not and vice versa

6. **population age structure**: The age of the population in the nearby neighbourhood determine the property type, property value and potential new buyers

62

29

Literature Review – Findings

No.	Economic Factors
1	Market Condition
2	Tax system
3	Land cost
4	population employment structure
5	population size and density
6	population age structure
7	GDP
8	Sales of similar houses
9	Maintenance Cost
10	Property Appraisal

7. **GDP**: The GDP is at a macro level which has effect on the property value nationwide.

8. **Sales of similar houses**: The sale cost of the similar projects are most of the times the base to develop the pricing of the real estate projects

9. **Maintenance Cost**: The maintenance cost of the project is an important factor for the buyer. Buyer would not prefer projects with high maintenance costs.

10. **Property Appraisal**: The after-purchase property appraisal is one of the most important factors which the buyer considers while purchasing the property.

63

Literature Review – Findings

No.	Legal Factors
1	Legal Process
2	Title Clearance
3	Compliance with Government Rules

1. **Legal Process:** The legal processes of obtaining the property has an impact on the buyer's decision of purchasing the property.

2. **Title Clearance**: The title of land and property must be clear.

3. **Compliance with Government Rules**: The property should be compliant with the government rules

Literature Review – Findings

No.	Social Factors
1	Developers brand name
2	Ease of business
3	Developers past projects performance
4	Developers Financial Strength
5	Sale Strategy
6	Level of customer satisfaction
7	Consumer Psychology
8	Herd effect
9	social public opinion
10	Social Status

1. **Developers brand name**: The brand name of the developer plays an important role while selling the property. Brand name is attached to the past performances and customer satisfaction.

2. **Ease of business**: For a purchaser of the property, it is very important to have the ease of doing business with the developer.

3. **Developers past projects performance**: The past projects performance gives the purchaser the idea of the developers experience in the business and gives a sense of property appraisal

4. **Developers Financial Strength**: The financial strength of the developer would suggest the purchaser that if there is some problem during the construction phase, the developer has the strength to cover and mitigate it.

5. **Sale Strategy**: The sale strategy is highly important in selling of property. Poor strategy can lead to failure of project

6. **Level of customer satisfaction**: The customer satisfaction level from the previous projects can establish confidence in potential new customers which leads to project success

Literature Review – Findings

No.	Social Factors
1	Developers brand name
2	Ease of business
3	Developers past projects performance
4	Developers Financial Strength
5	Sale Strategy
6	Level of customer satisfaction
7	Consumer Psychology
8	Herd effect
9	social public opinion
10	Social Status

7. **Consumer Psychology**: The consumer psychology is an important factor. Correct approach in explaining the project will lead to positive impact and will change the wat the person will look towards the project

8. **Herd effect**: The herd effect means that when some property is bought by several people, other people tend to buy that property.

9. **social public opinion**: The public opinion about the project is very important. Even good projects can fail due to poor public opinion and vice versa

10. **Social Status**: The property does not resonate with the social status of the potential buyers, then it may lead to project failure.

28

Thank You

APPENDIX

Outline

Harsh Patel — **Retail Sector**

Haimil Patel — **Affordable Housing Initiatives**
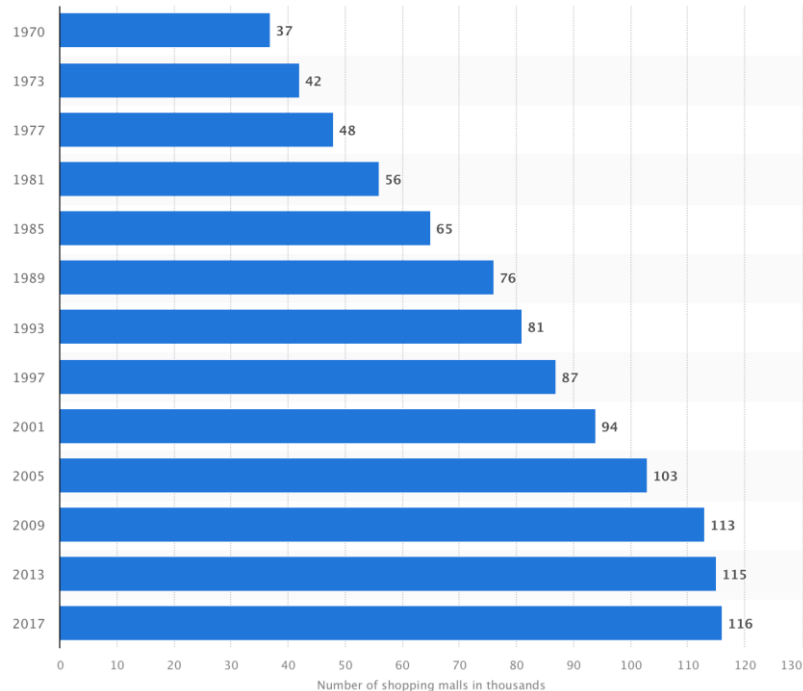
Krunal Patel — Sustainability in Real Estate

Jennie Gandhi — Real Estate new trends and technologies

Kahan Shah — Topic

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure** and **Public Space**

Retail Sector

Number of shopping malls in thousands

Year	Number
1970	37
1973	42
1977	48
1981	56
1985	65
1989	76
1993	81
1997	87
2001	94
2005	103
2009	113
2013	115
2017	116

https://www.statista.com/statistics/208059/total-shopping-centers-in-the-us/

- In 2017, 116,000 shopping malls spread across USA.
- A shopping mall is typically a covered establishment with shops and restaurants as well as other retail establishments where people can walk between.
- In 2018, the US had the largest square footage of retail space per capita worldwide at 23.5 SF per person, second was Canada with 16.8 SF and third Australia with 11.2 SF
- This clearly is very high compared to the rest of the world
- The number also suggests the over-supply of retail space in the US

COLUMBIA|CBIPS
Center for Buildings, Infrastructure and Public Space

The Story of Mall of America

https://en.wikipedia.org/wiki/Mall_of_America#/media/File:2018_Mall_of_America_01.jpg

- Located in Bloomington, Minnesota
- Largest mall in the US
- 5,600,000 SF of Gross Leasable Area
- Shops, Restaurants, Hotels, Movie Theatre, Theme Park (Nickelodeon Universe)
- Valued at $2.31 Billion in 2014
- Owner of the property, Triple Five Group missed three consequent mortgage payments in 2020 and thus it was re-valued to restructure the mortgage.
- Cut down by 16% to $1.91 Billion in August 2020.

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure** and **Public Space**
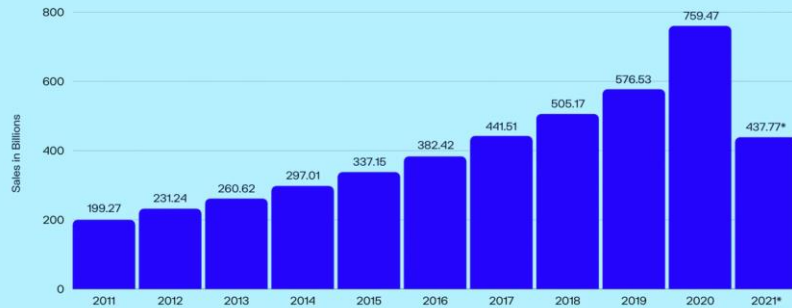
Design of Mall Floor Plan

- Anchor tenants: Main stores of the mall, they bring all the footfall
- Some major Anchor Tenants over the decade has been Lord & Taylor, Macys, Saks 5th Avenue, Barneys, Neiman Marcus, Nordstrom, Sears, JCPenney
- These major stores expanded rapidly in the last decade and thus are now facing a downfall with the rise of E-commerce
- JCPenney, Lord and Taylor, Barneys, Sears, Neiman Marcus have already filed for bankruptcies and closed most of their retail stores
- Loss of an anchor tenant to the mall, less footfall to the small retailers in the mall

COLUMBIA|CBIPS
Center for Buildings, Infrastructure and Public Space

The US Retail–Apocalypse

- A 2017 Credit Suisse report estimated 1 in 4 malls in US would close by 2022
- Rise of E-commerce main reason for the mall trouble
- Covid-19 pandemic accelerated the process
- Due to the pandemic consumers rapidly shifted to online sales

US Ecommerce Sales From 2011 to 2021 (In Billions)

Year	Sales in Billions
2011	199.27
2012	231.24
2013	260.62
2014	297.01
2015	337.15
2016	382.42
2017	441.51
2018	505.17
2019	576.53
2020	759.47
2021*	437.77*

*Only Q1 & Q2 figures
Source: Census.gov

OBERLO

https://www.oberlo.com/statistics/us-ecommerce-sales

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure and Public Space**

How to Deal with the Retail–Apocalypse?

- Re-purpose the malls to some other type of property like last-mile fulfilment centre, warehouses, industrial use, assisted living facilities, student housing
- Sudden boom in the Industrial Real Estate due to the increase in the online sales
- Buy the retail facility from foreclosure at a very distressed price and efficiently convert it into a warehouse
- Simon Property group: One of the biggest mall owners in US in talk with Amazon to collaborate for the void left by the closing anchor tenants to use the space as their distribution centre

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure** and **Public Space**

How to Deal with the Retail–Apocalypse?

10-YEAR FIXED RATE RANGES BY ASSET CLASS	August 2, 2021		
	Maximum Loan-to-Value	Class A	Class B/C
Anchored Retail	55 - 65%	195	205
Power Center	55 - 65%	270	280
Multi-Family (non-agency)	65 - 70%	165	175
Multi-Family (agency)	70 - 80%	155	165
Distribution/Warehouse	65 - 75%	170	180
R&D/Flex/Industrial	65 - 75%	185	195
Office	60 - 70%	185	195
Full Service Hotel	50 - 65%	410	430

Source: Cushman & Wakefield, Capital Market Update, July 10, 2020

- Transition from retail to industrial best way to swim through this crisis so far
- Banks are lending more to industrial properties currently
- Pandemic accelerated the online grocery sales and for efficient delivery the delivery networks need more warehouse space
- Malls are usually located near to a major residential population and thus has a really good advantage of being closer to the residential area in terms of the last-mile delivery
- Amazon, Best-buy, Walmart, Target are some of the major companies figuring out how to act on this opportunity of buying the under-performing malls and convert them into fulfilment centers

COLUMBIA | CBIPS
Center for Buildings, Infrastructure and Public Space

Affordable Housing Trends
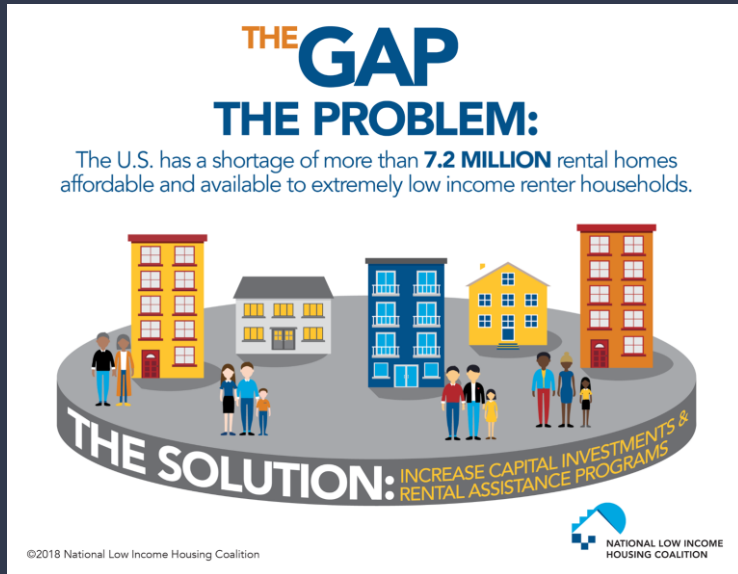
Source: Forbes, Adam Rudman, "Affordable Housing Is Disappearing: An Opportunity For The Real Estate Industry"

Inflation ⬆️ ↔️ **Median Wages**

Demand ⤵️ ⤵️ **Supply**
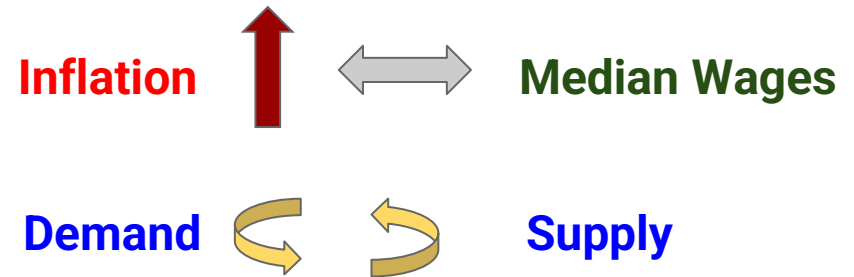
- Housing prices **out of reach** of the **lower-income tier**
- **Demand has been increasing** for **low-income housing**
- Observation by Adam Rudman, Forbes Councils Member: **"New development is not focused on affordable housing (unless it's part of a program), which creates a supply problem"**
- New investors usually invest in **renovation**, pushing the prices higher and lowering the available inventory of affordable housing

COLUMBIA | CBIPS
**Center for Buildings, Infrastructure and Public Space**

Housing Plan

➔ In May 2014, Mayor Bill de Blasio unveiled Housing New York: A Five-Borough, Ten-Year Plan to create and preserve 200,000 high-quality, affordable homes over ten years

➔ New York State legislature recently extended a temporary eviction moratorium until **January 15, 2022**

➔ 10 programs within housing plan to support the affordable housing initiative in NY:

1. Senior Affordable Rental Apartments (SARA)
2. NEW Mitchell-Lama Reinvestment Program
3. NEW Neighbourhood Pillars Program
4. Supportive Housing Loan Program
5. NEW Mixed-Income Micro
6. NEW Vacant Land Tax
7. New Home Fix
8. New Tiny Homes in the Big Apple
9. Extremely Low-and Low-Income Affordability
10. Mandatory Inclusionary Housing

Source: City Realty, "Affordable Housing Rundown: A comprehensive look at lotteries + additional programs to assist renters" https://www.cityrealty.com/nyc/market-insight/features/affordable-housing/affordable-housing-rundown-a-comprehensive-look-lotteries-additional-programs-assist-renters/27804
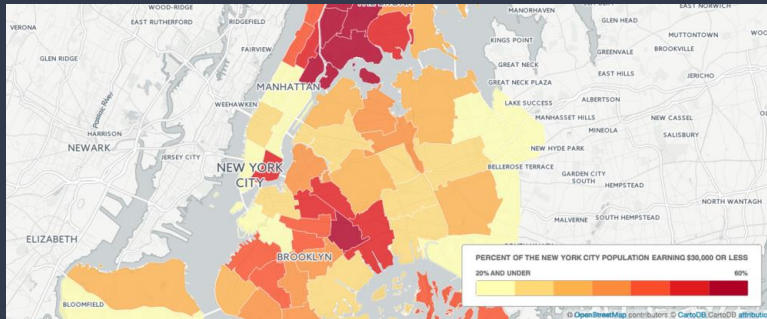
COLUMBIA|CBIPS
Center for Buildings, Infrastructure and Public Space

Mandatory Inclusionary Housing

Source: NYC Department of City Planning, Mandatory Inclusionary Housing
https://www1.nyc.gov/assets/planning/download/pdf/plans-studies/mih/bae_report_092015.pdf

Option 1:

- Requirement for a minimum of **10%** of housing to be affordable at **40% AMI** ($31,080 for a household of three)

Deep Affordability Option:

- **20%** of housing to be affordable at an average of **40% AMI** ($31,080 for a household of three)
- Subsidies allowed only where necessary to support more affordable housing

Modification of the Workforce Option:

- To reduce the average income requirement from **120% AMI to 115% AMI** ($89,355 for a household of three),
- Require **5% each at 70% AMI** ($54,390 for a household of three) and **90% AMI** ($69,930 for a household of three)

AMI: Area Median Income

COLUMBIA | CBIPS
Center for Buildings, Infrastructure and Public Space

Challenges for Affordable Housing in New York

- High property values affect the viability of constructing new affordable housing projects

- **Mandatory Inclusionary Housing** and **Reformed 421a** provides opportunities for new development

- To address housing needs for all residents of the City, the **Housing New York** plan set a goal to build or preserve **200,000 affordable housing units over the next 10 years**.

Source: NYC Department of City Planning, Mandatory Inclusionary Housing
https://www1.nyc.gov/assets/planning/download/pdf/plans-studies/mih/bae_report_092015.pdf

COLUMBIA|CBIPS
Center for **Buildings, Infrastructure and Public Space**

Research Objectives

Potential answers that are sought from the analysis

Why is there an existing gap in demand and supply of affordable housing in New York?

Can we consider case studies from other cities, states or countries that have or had similar challenges and how were they tackled?

How can government contribute to enhance the affordable housing projects (tax incentives, federal and state grants, etc.)

What will the affordable housing segment look like in the next 15 years?

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure** and **Public Space**

Real Estate Technologies

Source: '9 Disruptive Real Estate Technology Trends in 2021' Pavel Obod, Founder of boda Studio https://sloboda-studio.com/blog/real-estate-trends/

- Buying and selling Websites: The first and foremost popular way of digitizing a real estate business would be taking it online.
- Virtual Reality: A 3D virtual tour is a great millennial-like feature for letting customers explore the property.The technology real estate technology trend of using virtual reality is not a newsflash.
- Artificial Intelligence and Big data: They will be the ones who automate different segments of the real estate industry. Virtual tours will be highly in demand in the digital world. They will be integrated on both leasing and buying platforms.
- Mobile Apps: The perfect solution for easy navigation with the client requirements with filters to choose at their ease.

COLUMBIA | CBIPS
Center for Buildings, Infrastructure and Public Space

Influential Issues on Real Estate Industry

Source:'6 Use cases of big data and artificial intelligence' by Natalilia Kharchenko
https://bigdata-madesimple.com/6-use-cases-of-big-data-ai-in-real-estate/

1. **Economic issues:**
   - job and income growth,
   - available qualified labor,
   - interest rates,
   - cost of capital and its availability.
2. **Political issues:** the political landscape and government budget issues.
3. **Development issues:** construction costs.

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure and Public Space**

Research Outcomes

Proposing new business model

Targeting the Local market

Global Digitalization and impact across the globe

Changing Estate priorities for innovative business ideas

THANK YOU

COLUMBIA | CBIPS
Center for **Buildings, Infrastructure and Public Space**