

Memorandum

TO: Gerry Bogacz, NYMTC

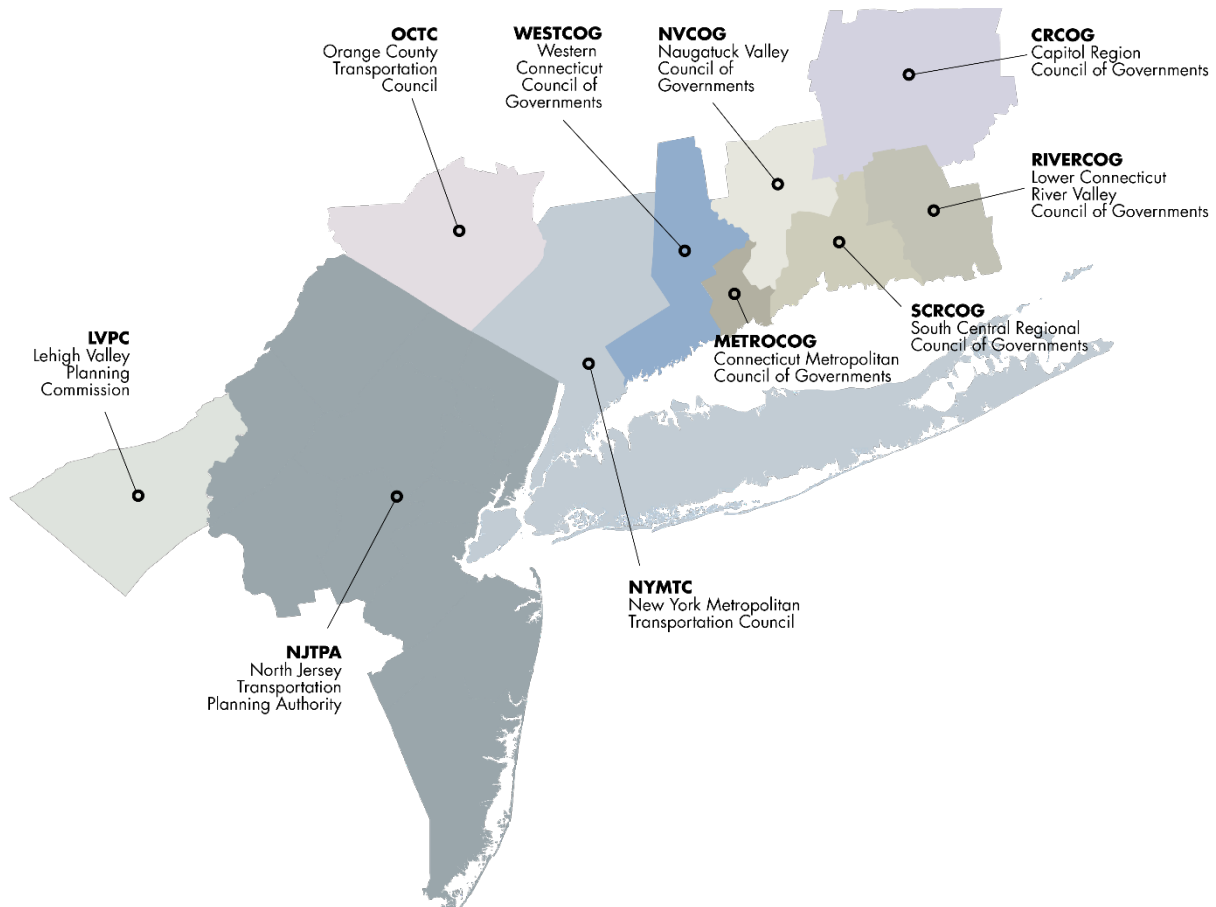
FROM: Maggie Haight, Yamilée Duroseau, and Brian Holliday - BJH Advisors, LLC

DATE: September 14, 2021

RE: Task 2.3 Freight Land Use and Real Estate Market Analysis Final Technical Memorandum

INTRODUCTION - REAL ESTATE MARKET ANALYSIS

As part of NYMTC's Regional Freight Land Use Study to assess the current mix of land uses related to goods movement in the region, BJH Advisors (BJH) summarized real estate market data in the project's study area, defined as the Metropolitan Area Planning (MAP) Forum region. Real estate market data was primarily sourced from CoStar, but also included supplementary information from public and private sources where needed. Data covered trends over the past 5-, 10-, and 20-year periods as it was available for the counties and regional councils (regions) below.



The goal of this work was to understand the dynamics of subregional industrial markets and the distribution of freight-related and industrial land-use properties throughout the region, with special attention to how the region's supply and use of land have supported freight-generating economic activity over the past 20 years.

We found that inventories of buildings and square footage increased the most along key corridors such as I-78 and I-476 in the Lehigh Valley in Pennsylvania (PA) and Interstate 95 in New Jersey (NJ). These properties tended to be larger than 300,000 square feet (SF), and relatively newly constructed. In denser areas, such as New York City (NYC), new construction occurred, albeit on a smaller scale in terms of total new SF coming online (average property size is comparable to PA). Since there is more competition for land closer to the NYC Metro Area, these buildings generally demanded higher rent. In the past five years, commercial rents for the analyzed real estate markets increased by 39% in NJ and over 50% in Staten Island, Queens, and the Bronx, all located in NYC.

We expect freight generating and industrial land use needs to continue to grow as businesses continue to cluster around major metropolitan areas, like NYC, and trends like e-commerce delivery increase. However, the real estate market is in flux due to the COVID-19 pandemic, and populations may spread out of dense urban areas if more employers allow telework. These factors may potentially impact demand for freight-generating or terminating uses over the medium- to long-term in high-cost areas where there is competition with other uses such as housing and employment land.

METHODOLOGY

Data Sources

To analyze the industrial real estate market in the study area, BJH pulled Current Market and Historical Trends data from Costar, a leading provider of real estate information and analytics. We analyzed data from CoStar's comprehensive real estate database in Q4 2020. CoStar is widely used as a primary source of data for real estate market information, but it proved to have some limitations due to its aggregation of data from property managers, building owners, and real estate brokers. Data is updated via electronic databases (for larger portfolios or property managers), changes in listings, or idiosyncratic phone calls, meaning that all data is not updated comprehensively from the initial posting. Industrial buildings specifically may be affected due to property type classification, timely updates on availability and vacancy, change of tenants, and price changes due to supply and demand.

It is important to note that CoStar data includes records representing rented or rentable industrial properties. Facilities such as the Port Authority of New York and New Jersey's marine terminals, legacy industrial facilities such as Bayway Refinery in New Jersey, rail intermodal and transload facilities, and some other major freight generators are not included in this database or this analysis.

Technical Approach

The analysis is divided into two sections: Current Market Trends, which summarized characteristics of the current stock of industrial buildings in the study area; and Historical Trends, which summarized aggregate time trends in the study area.

The Current Market Trends analysis summarized the current number of existing, under construction, and recently completed buildings; rentable building area (RBA) by year built, type, and county; rent on a per square foot basis; and vacancy rates. The data was aggregated at the property level data by county or planning area through the following use type subcategories:

Cold Storage

- Typically start at 25,000 SF+ RBA
- Office area up to 20%
- 1 loading dock for every 15,000 SF
- Up to 50% site coverage (Floorplate area of the ground floor divided by land area)
- Must have refrigeration and cross docks
- Typically used for long-term storage of already processed and prepared food for longer periods of time

Food Processing

- A facility used for the processing and packing of food products
- May or may not have cold storage or freezer space
- Typical uses include bottling plants, bakeries, canneries, frozen foods, and dry foods.

Metro Distribution

- Combination of Distribution and Truck Terminal space coded by CoStar
- Office area typically up to 5 or 10% of SF
- Cross docks
- Clear heights 28 feet +

Production

- Combination of manufacturing and flex space coded by CoStar
- Office space may be greater than 50% + of the total SF
- Ceiling heights may be under 18 feet

Warehouse

- Typically 25,000 SF +
- Office area up to 20%
- 1 loading dock for every 15,000 SF
- Clear heights of 22 feet +
- Site coverage is typically up to 50%

The Historical Trends analysis summarized the percent change in the number of existing buildings and square foot inventory, rent per square foot, and vacancy rates per county or COG from 2000 – 2020.

Key Terms

- **Council of Government (COG)** – Nine planning regions in the state of Connecticut from which municipalities within these planning regions can address common interests in accordance with the state’s plans and programs.
- **Price Per Square Foot (PSF)** – The cost to lease one square foot of floor space. This metric is usually provided on an annual basis.
- **Rentable Building Area (RBA)** – The portion of a building in which a tenant will pay rent to use. This is the sum of the tenants’ leased space and the tenants’ share of common areas.
- **Under Construction or Proposed Buildings** – Buildings that are currently either under construction or have been announced for future development but have not started the construction phase.
- **Recently Constructed Buildings** – Buildings that have RBA greater than or equal to 50K SF and have completed construction between the years of 2015 and 2020.

ANALYSIS

Current Market Trends

The Current Market Trends analysis evaluated a total of 36,491 industrial buildings in the study area. Approximately 75% of the buildings were classified as Warehouses, followed by Food Processing at 20%, and Metro Distribution at 3%. Overall, Food Processing had the lowest vacancy rate at 0.8% and Metro Distribution had the highest at 7.5%. **Table 1: Overview of Industrial Buildings**, provides a summary of the buildings in the study area.

Table 1: Overview of Industrial Buildings

Property Type	# of Existing Buildings	Rentable Building Area (RBA)	Vacant Building Area (SF)	Vacancy Rate
Cold Storage	69	5.37 Million SF	142,330	2.7%
Food Processing	109	4.99 Million SF	38,475	0.8%
Metro Distribution	1,277	95.0 Million SF	7,106,990	7.5%
Production	7,418	256 Million SF	11,531,132	4.5%
Warehouse	27,618	644 Million SF	28,305,637	4.4%
Total	36,491	1.00 Billion SF	47,124,564	4.7%

The following figures and charts will provide more detail into where each property type is concentrated and where the demand may be potentially increasing or decreasing.

In this CoStar dataset, shown in **Figure 1: RBA by Type and County**, Kings County (Brooklyn) recorded the greatest amount of industrial space with 117 million SF, followed by Hudson County with 103 million SF and Queens County (Queens) with 87 million SF. Tolland County in Connecticut (CT) had the lowest amount of industrial space with a total of 235,575 SF.

Figure 1: RBA by Type and County

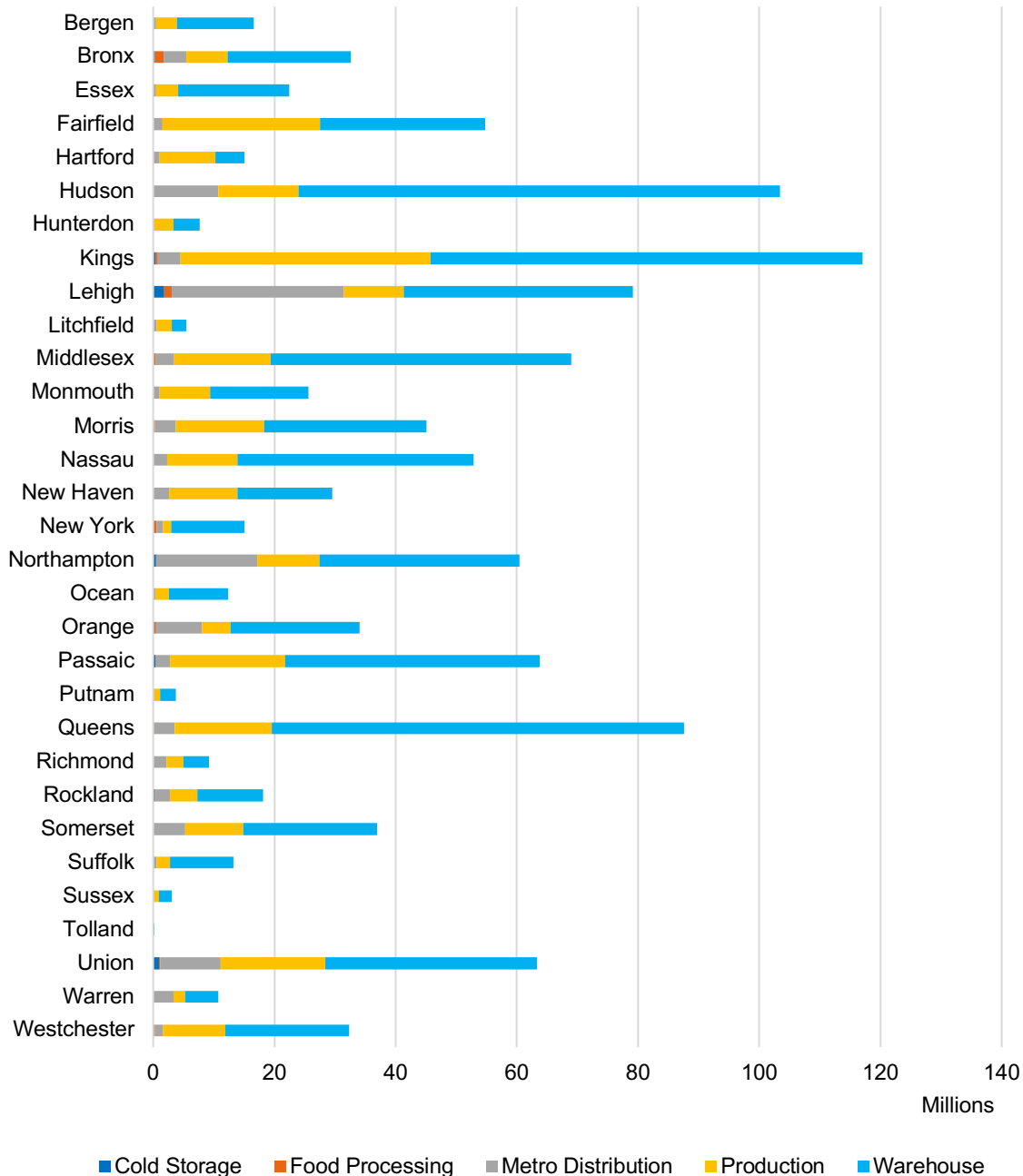
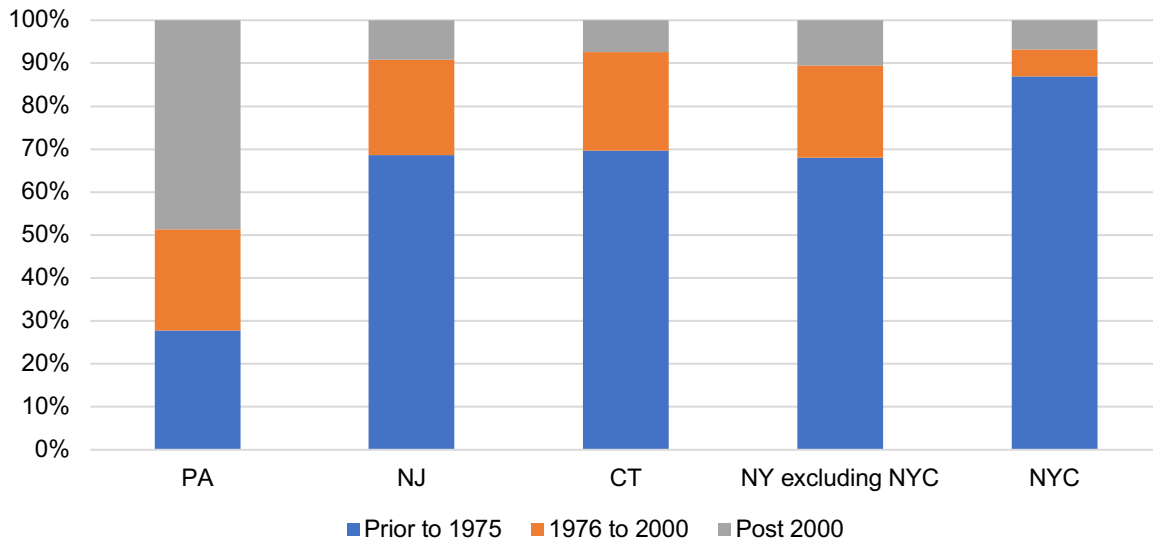


Figure 2: RBA by Year Built shows that most buildings in NJ, CT, and NY were built before 1975. The Lehigh Valley region of PA had the largest percentage of newer developments including buildings constructed post-2000. Nearly half of the inventory in the Lehigh Valley has been constructed since 2000. New York City has the largest percentage (more than 85%) of RBA built before 1975.

Figure 2: RBA by Year Built



On average, **Figure 3: Properties by Size** shows that PA also had the largest facilities, on average, where approximately 50% of its industrial properties recorded an RBA greater than 100,000 SF. New Jersey followed with approximately 30% of its properties greater than 100,000 SF. The majority of properties in CT, NY, and NYC were less than 100,000 SF.

Figure 3: Properties by Size



Figure 4: Vacancy Rate by County shows that throughout the study area, Richmond County (Staten Island) had the highest vacancy rate of approximately 17%. This can be attributed to two buildings, 526 Gulf Avenue and 566 Gulf Avenue, both recently purchased by Amazon but recorded as vacant in the data. They consist of a 950,000 SF Metro Distribution facility, which is currently being reconstructed to fit Amazon's needs, and a 450,000 SF warehouse. Other counties of note with high vacancy rates were Sussex and Warren Counties, which both had five and four 100% vacant properties, respectively.

Figure 4: Vacancy Rate by County

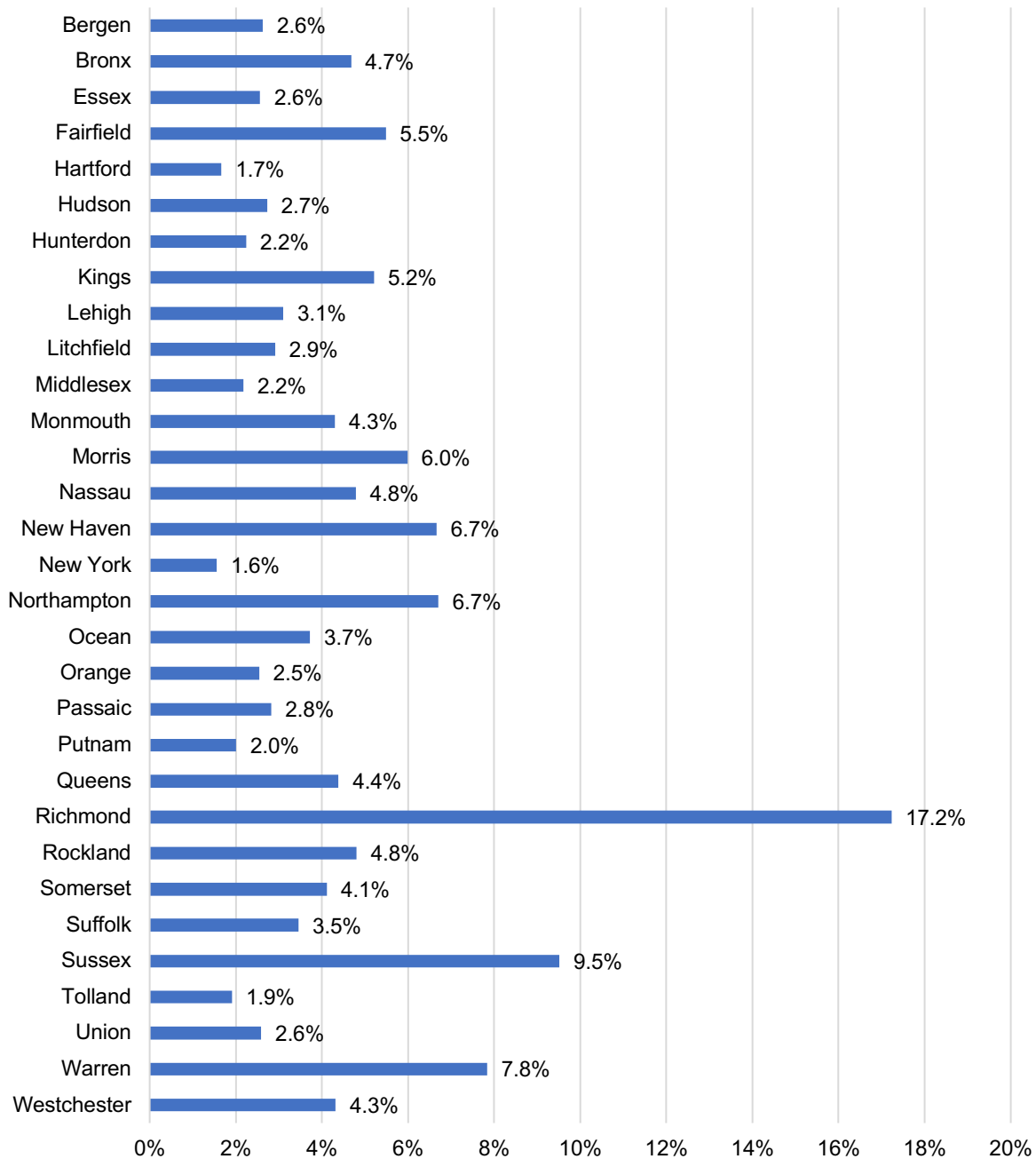
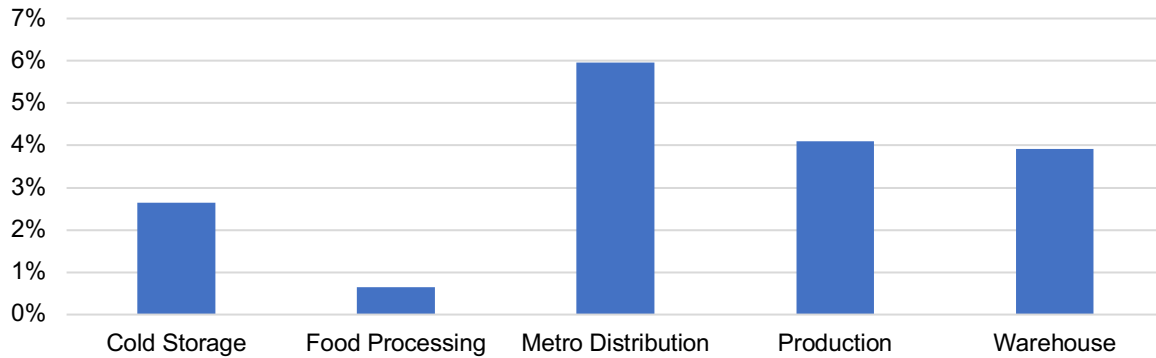


Figure 5: Vacancy Rate by Type shows Metro Distribution had the highest vacancy rate at approximately 6%. Food Processing had the lowest vacancy rate at approximately 0.5%.

Figure 5: Vacancy Rate by Type



In **Figure 6: Under Construction and Proposed Buildings**, the graduated symbols represent the geographic location of each building under construction or that has been proposed as of Q4 2020, and the radii are scaled to the RBA of the building. Under construction and proposed industrial buildings were clustered in Eastern PA in the Lehigh Valley and along the I-95 corridor through NJ. Most of the new facilities being constructed were greater than 70K SF, but some smaller Warehousing, Metro Distribution, and Production facilities were also being constructed closer to the NYC area.

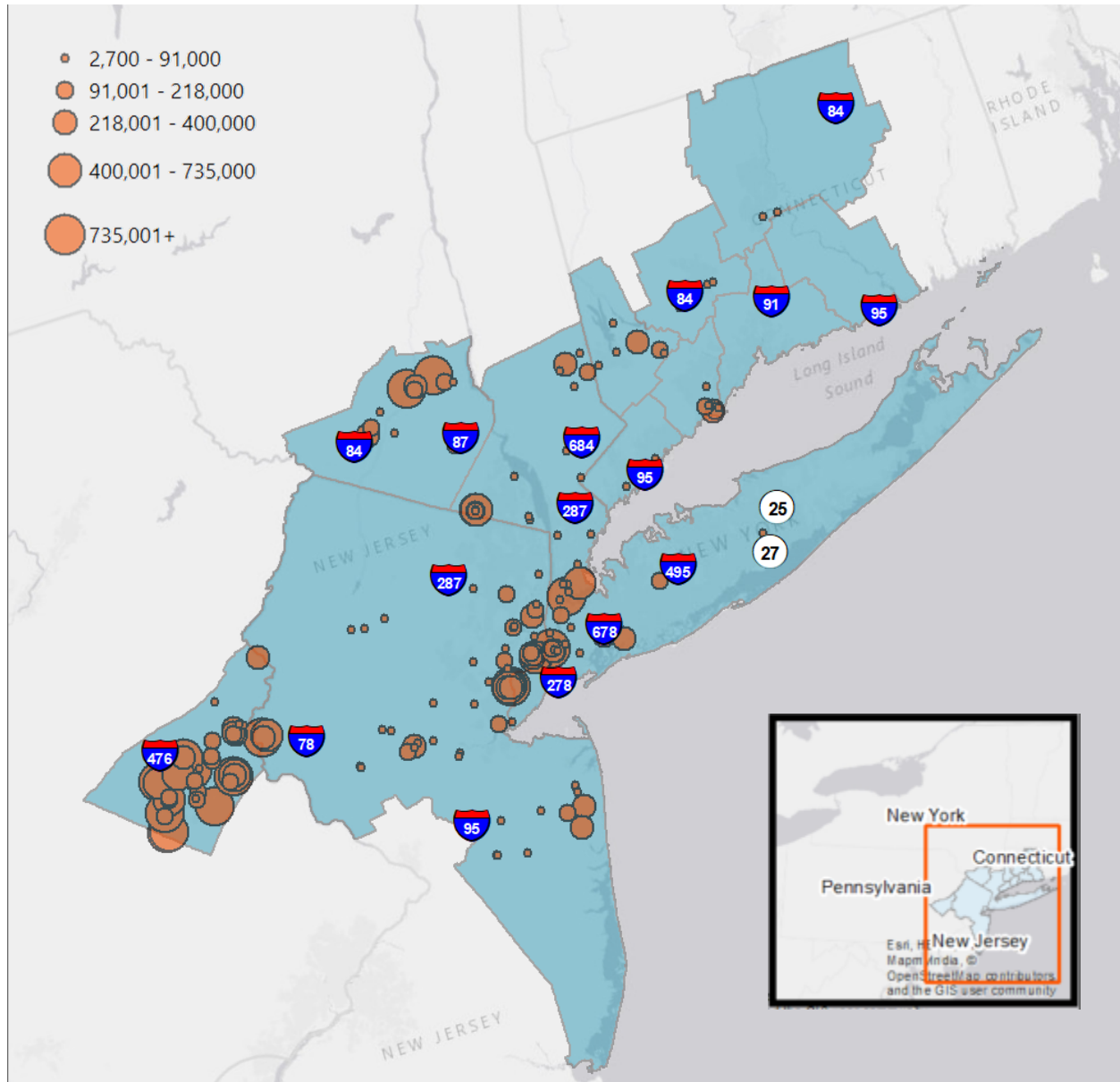
Figure 6: Under Construction and Proposed Buildings

Table 2. Largest Under Construction and Proposed Total RBA by County lists the top seven counties with the largest total RBAs. Lehigh and Northampton Counties in PA, each had over seven million SF making them the two topmost counties in our study area. Both counties also had the highest number of buildings under construction and proposed facilities. Northampton had 20 such buildings and Lehigh had 17. The NJ region had the second-largest total RBA for under-construction and proposed buildings, with Union County at 4.28 million SF. Additionally, Hudson and Warren Counties both had over 2 million SF that were either under construction or proposed.

Table 2: Largest Under Construction and Proposed Total RBA by County

County Name	State	Number of Buildings	Total RBA by County
Northampton County	PA	20	7.45M
Lehigh County	PA	17	7.43M
Union County	NJ	12	4.28M
Orange County	NY	11	3.69M
Hudson County	NJ	5	2.65M
Kings County	NY	11	2.46M
Warren County	NJ	3	2.18M

In terms of high average building size, **Table 3: Largest Under Construction and Proposed Average RBAs by County**, shows that Northampton and Lehigh Counties in PA, along with Warren and Union Counties, all had high average RBAs for under-construction buildings – over 350K SF. Warren County stands out with over 700K SF of RBA. Bronx, Orange, and Kings Counties in NY were also of note considering their respective average RBAs, though their values were driven by only a handful of under-construction buildings.

Table 3: Under Construction and Proposed Top 7 Average RBAs by County

County Name	State	Number of Buildings	Average RBA by County
Warren County	NJ	3	727K
Lehigh County	PA	17	437K
Northampton County	PA	20	372K
Union County	NJ	12	356K
Bronx County	NY	6	346K
Orange County	NY	11	336K
Kings County	NY	11	223K

Table 4: Under Construction and Proposed Building Use Type suggests that the buildings under construction were mostly Warehouse buildings, followed by Metro Distribution and Production facilities.

Table 4: Total Number of Under Construction and Proposed Buildings by Use Type

Building Use Type	Number of Buildings
Warehouse	110
Metro Distribution	55
Production	21
Food Processing	1
Total	187

Figure 7. Recently Constructed Buildings (2015 - 2020) and the accompanying tables display recently constructed buildings, from 2015 through 2020, with RBAs of 50K SF or greater in the NYMTC study area. The graduated symbols represent the geographic location of each building, and the radii are scaled to the RBA of the building. Recently constructed buildings are mostly clustered in Eastern PA in the Lehigh Valley and along the I-95 corridor through NJ, though we also see a cluster in Orange County, NY.

Figure 7: Recently Constructed Buildings (2015 - 2020)

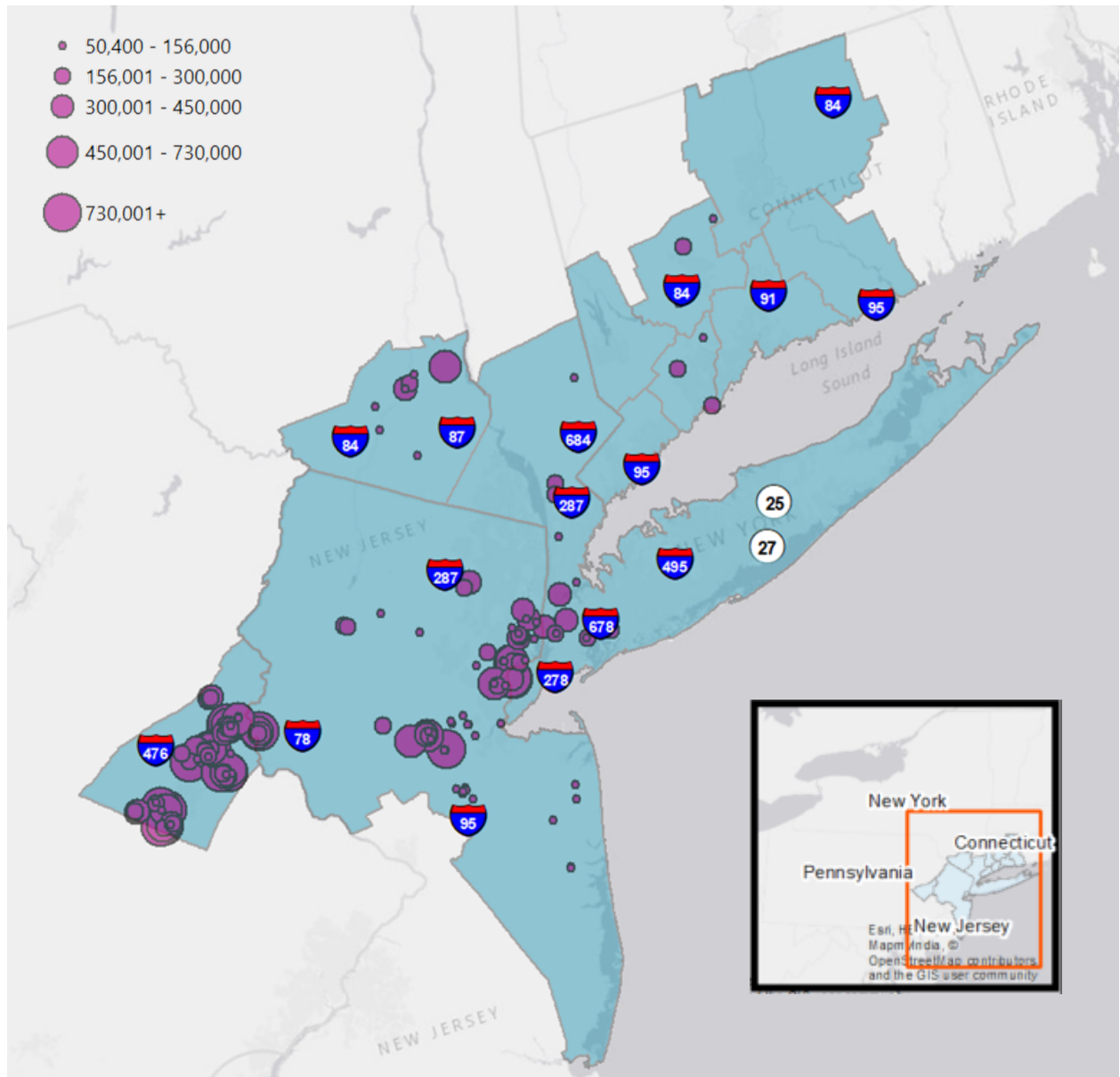


Table 5: Largest Recently Constructed Total RBA by County (2015 – 2020) shows the areas with the most buildings that fit this criterion were Eastern PA and Central NJ. Northampton County, PA by far had the most recently constructed buildings with 42, as well as the highest total RBA with 16.5 million. Lehigh County, PA, the next closest county had 19 recently constructed buildings and 8.58 million RBA. Lehigh and Northampton Counties account for 53% of the total RBA for recently constructed buildings from 2015 – 2020. Richmond County (Staten Island) has recently built large facilities, having 3.26 million SF of RBA, with only four new buildings. New Jersey's Union, Hudson, and Warren Counties stand out because each county had over 2 million SF of RBA as recently constructed.

Table 5: Largest Recently Constructed Total RBA by County (2015 – 2020)

County Name	State	Number of Buildings	Total RBA by County
Northampton County	PA	42	16.5M
Lehigh County	PA	19	8.58M
Somerset County	NJ	11	3.44M
Richmond County	NY	4	3.26M
Union County	NJ	11	2.75M
Hudson County	NJ	13	2.28M
Warren County	NJ	4	2.18M

Table 6: Largest Recently Constructed Average RBAs by County (2015 – 2020) shows that Richmond County (Staten Island) had the highest RBA with four new buildings listing an average RBA of 814K SF. Somerset County, NJ had 11 facilities with an average RBA of 313K SF. Northampton and Lehigh Counties had the greatest number of recently constructed buildings. Lehigh County's buildings had an average of 452K SF and Northampton County's had an average of 394K SF.

Table 6: Average Recently Constructed Average RBAs by County (2015 – 2020)

County Name	State	Number of Buildings	Average RBA by County
Richmond County	NY	4	814K
Warren County	NJ	4	544K
Lehigh County	PA	19	452K
New York County	NY	1	398K
Northampton County	PA	42	394K
Somerset County	NJ	11	313K
Passaic County	NJ	2	300K

Table 7: Recently Constructed Buildings by Use Type (2015 – 2020) show that Warehouse facilities and Metro Distribution facilities made up the majority of the most recently constructed buildings.

Table 7: Recently Constructed Buildings by Use Type (2015 – 2020)

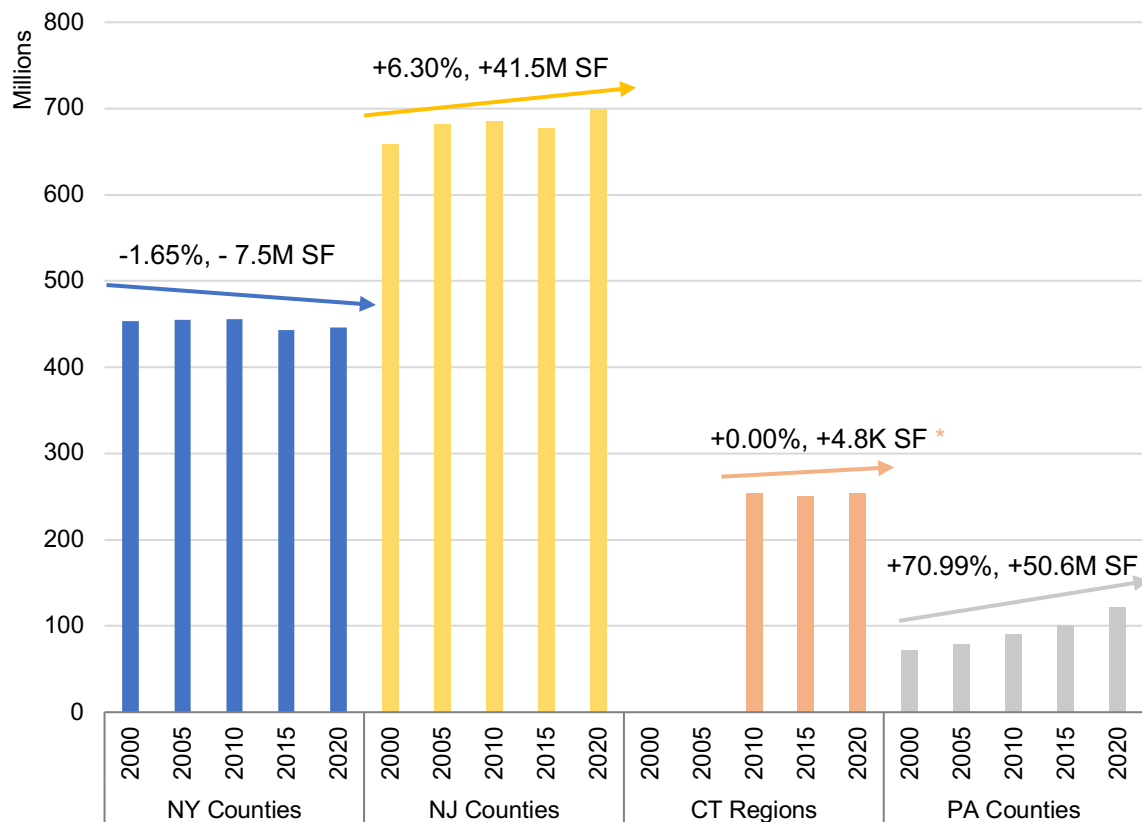
Building Use Type	Number of Buildings
Warehouse	76
Metro Distribution	64
Production	16
Food Processing	1
Cold Storage	1
Total	158

Historical Trends Data

The following analysis illustrates industrial building trends in the study area from 2000-2020. It evaluated building and square footage inventory and rent per square foot. In **Figure 8**, the trend line signifies whether there was an increase or decrease in square footage inventory over the 20-year period. The text above the trend line provides the percent and net change. Note, there was no data for the CT COGs before 2006 because CoStar was not recording data there at that time. Therefore, we only have data points for 2010, 2015, and 2020.

Figure 8: Inventory Square Footage (2000 - 2020) shows that overall square footage increased significantly in PA and NJ, and marginally in CT. Interestingly, the total number of buildings in the dataset decreased in NJ and CT, but the overall square footage of industrial uses still increased due to the larger sizes of the new buildings. NY counties were the only ones that decreased in inventory square footage. Despite the decrease, NY counties still had the second-highest amount of inventory square footage. NJ (+6.30%, +41.5M SF) had a large increase in inventory square footage and had the highest square footage in the data. Counties in PA (+70.99%, +50.6M SF) had the largest raw and percent increase in square footage, but still lag the rest of the counties in total square footage.

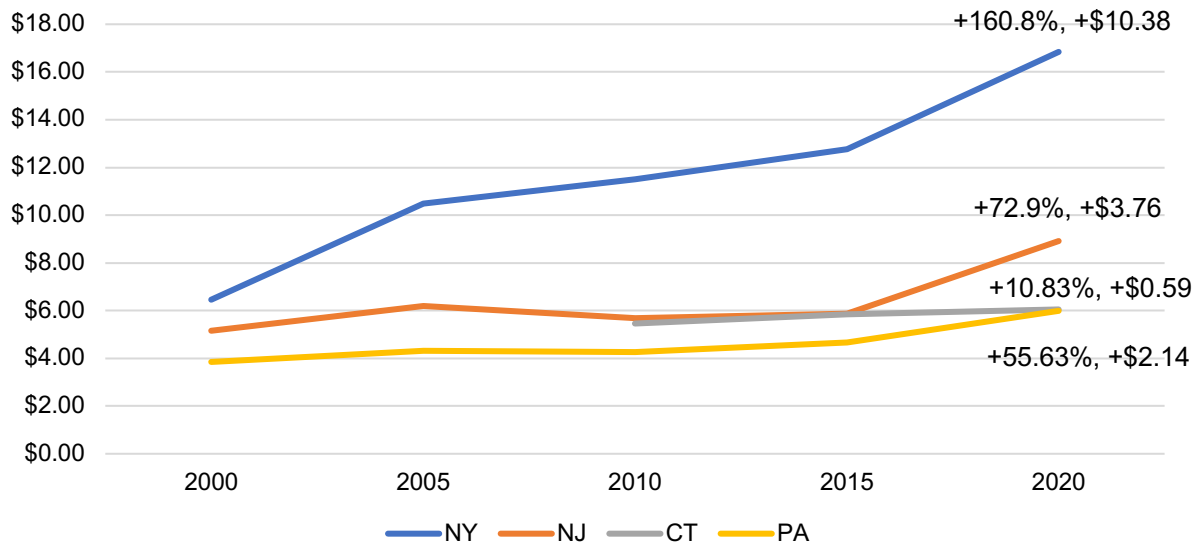
Figure 8: Inventory Square Footage (2000 - 2020)



* CT data not available before 2006

Figure 9: Weighted Average PSF Rent by State shows that all states had rent increases, but none greater than NY's (+160.8%, +\$10.38), likely due to higher land prices and competition with other uses like housing or commercial office. Pricing could also be impacted by lower vacancy rates and less available supply. Though not shown in a chart, it should be noted that in NYC from 2000-2020, Richmond County's square footage increased by +59.4% or 3.1 million SF, however, this was not enough to make up for the other counties of NYC that decreased in square footage, including Kings (-7.21%, -7.1M SF), Queens (-4.4%, -3.4M SF), Bronx (-2.0%, -608K SF), and New York (-58.9%, -7.6M SF).

Figure 9: Weighted Average PSF Rent by State (Study Area Counties & COGs)



Tables 10 and 11 show the magnitude of the top five and bottom five counties in the study area in terms of weighted average PSF rent. Even the counties or COGs at the bottom of the list still exhibited positive percent and net changes, indicating demand for industrial real estate over time.

Table 8: Top Five Rent by County (2000 – 2020)

County/Region	State	2010 - 2020 Values	Dollar Change	Twenty-Year Percent Change
Kings County	New York	\$4.80 - \$25.30	\$20.50	+426.86%
Richmond County	New York	\$7.15 - \$16.89	\$12.22	+261.56%
Bronx County	New York	\$7.69 - \$23.35	\$15.66	+203.77%
Queens County	New York	\$7.53 - \$22.65	\$15.12	+200.70%
Westchester County	New York	\$5.54 - \$16.48	\$10.95	+197.79%

Table 9: Bottom Five Rent by County (2000 - 2020)

County/Region	State	2010 - 2020 Values	Dollar Change	Twenty-Year Percent Change
Morris County	New Jersey	\$6.64 - \$8.00	\$1.36	+20.44%
Hunterdon County	New Jersey	\$6.57 - \$9.91	\$3.34	+50.91%
Orange County	New York	\$4.16 - \$6.29	\$2.13	+51.11%
Lehigh County	Pennsylvania	\$3.79 - \$5.78	\$1.99	+52.34%
Somerset County	New Jersey	\$5.60 - \$8.80	\$3.20	+57.19%

CONCLUSIONS AND NEXT STEPS

In conclusion, across the Study Area, the Lehigh Valley area in PA has seen the most growth in total RBA (71%, 50.6 million SF) from 2000 – 2020, with most new buildings greater than 200,000 SF. Leading contributors to this growth are Warehouse and Metro Distribution use types, spurred by the growth of e-commerce, access to major transportation routes along Interstates 78 and 81, and proximity to major population centers like the New York City metro area (NYC MSA).

Closer to the NYC region, areas of NJ, such as Middlesex County and the Meadowlands had the largest total proposed and under construction RBA at 1.1 million SF. Again, these properties are larger (most are greater than 300,000 SF), and mainly Warehouse and Metro Distribution use types. In addition, a Food Processing and a Cold Storage facility have been recently constructed in this area, and these two use types exhibit some of the lowest vacancy rates across all use types. Like the Lehigh Valley, the continued growth of freight-related industrial land use is expected in this key geography.

The more mature, suburban areas of CT and Long Island experienced less change in freight-related RBA from 2000-2020, due to several factors described below. Overall, these areas are representative of a freight-related industrial typology that is different than that

seen in the growing areas of PA and NJ. Inventory is older and smaller. In CT, the median year built is 1967 and the median RBA is 8,500 SF, while the area still commands relatively high rents (average of \$6.05 PSF in 2020) and vacancies remain low. Several factors may impact industrial development in CT and Long Island. Land generally has a higher cost to develop relative to areas in PA and NJ. Freight tenants likely want proximity to the Port of New Jersey and to be west of the Hudson River (significant toll fees) and may find operating in CT or Long Island problematic. Another factor is the rocky terrain in CT, which makes new development more difficult or costly. On the contrary, land in PA (agricultural Lehigh Valley) and NJ (flatlands or wetlands) is flat, which makes them more conducive to development.

The NYC area shares some of the characteristics of CT, including older and smaller inventory, but has seen more recent growth. Although the PA region had the highest increase in RBA, the low vacancy rates and increased rents in the NY and NJ regions suggest that being closer to the city core is still considered a commodity. Except for New York County (Manhattan), four out of the five counties with the highest percent change in weighted rent PSF were in NYC. Future development of freight-related uses in NYC and the immediately surrounding area will be most impacted by available suitable land and competition from other uses.

Overall, even the counties or COGs with lower rent PSF compared to the other counties and COGs that we studied still exhibited positive percent and net changes, indicating sustained demand for industrial real estate over the 2000-2020 time period in the Study Area.

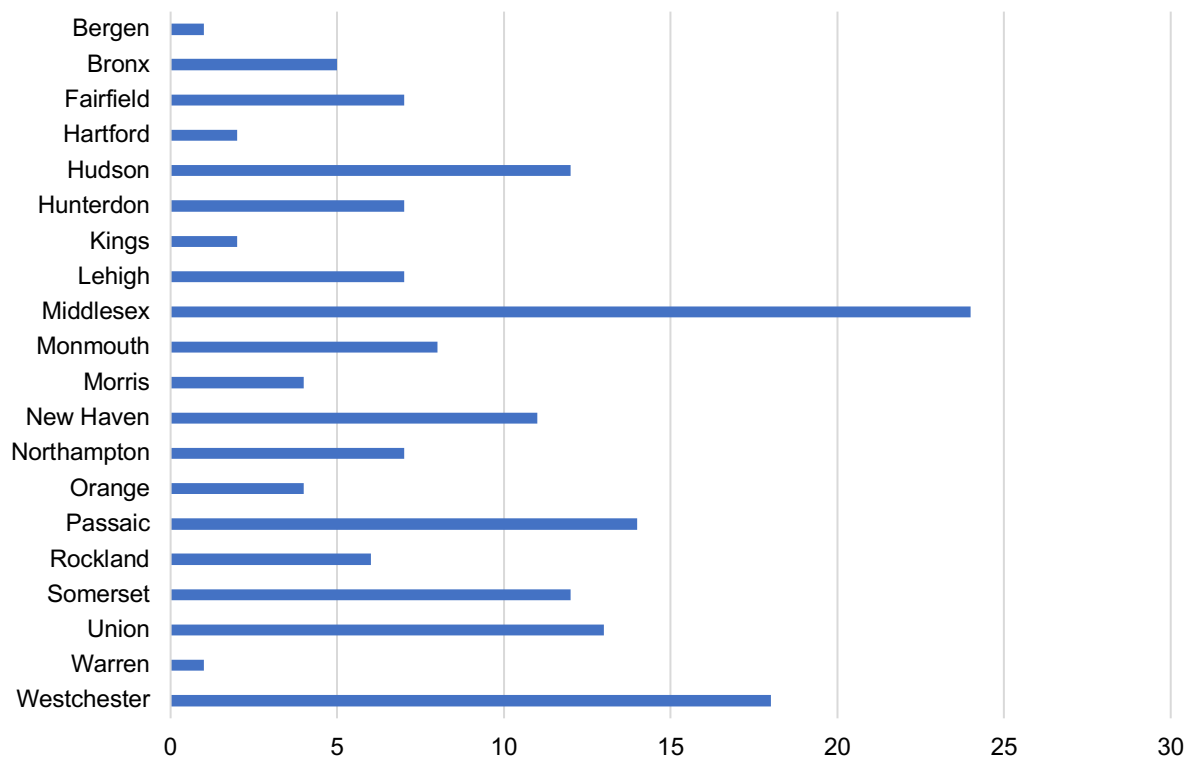
The patterns of the geographic distribution of industrial inventory across the region, as presented in this memorandum, will serve as one component of the development of the freight land use typology in a later task of this study. Other data points, including land use and planning information (Task 2.2 and 2.4), and industry trends (Task 3), will help to identify areas with unifying characteristics and to distinguish different types of freight land uses based upon key characteristics.

APPENDIX - ADDITIONAL CHARTS

Selected Counties/Regions

New York Counties	New Jersey Counties	Pennsylvania Counties	Connecticut Regions
Bronx County	Bergen County	Lehigh County	Capitol Region
Kings County	Essex County	Northampton County	Metropolitan Region
Nassau County	Hudson County		Naugatuck Region
New York County	Hunterdon County		Northwest Hills Region
Orange County	Middlesex County		River Valley Region
Putnam County	Monmouth County		South Central Region
Queens County	Morris County		Western Region
Richmond County	Ocean County		
Rockland County	Passaic County		
Suffolk County	Somerset County		
Westchester County	Sussex County		
	Union County		
	Warren County		

Figure 10: Number of Properties with Access to Rail by County or COG



* Access to Rail – defined as access to or reasonable walking distance to a commuter rail stop by CoStar

Figure 11: RBA by Ceiling Height and Type

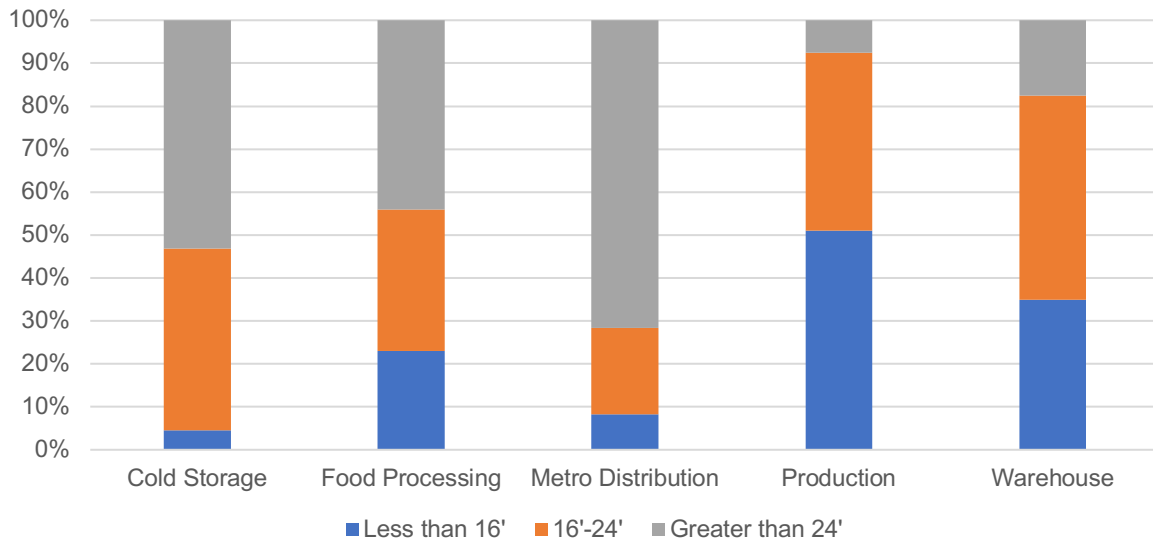


Figure 12: RBA by Ceiling Height and Type in New York City

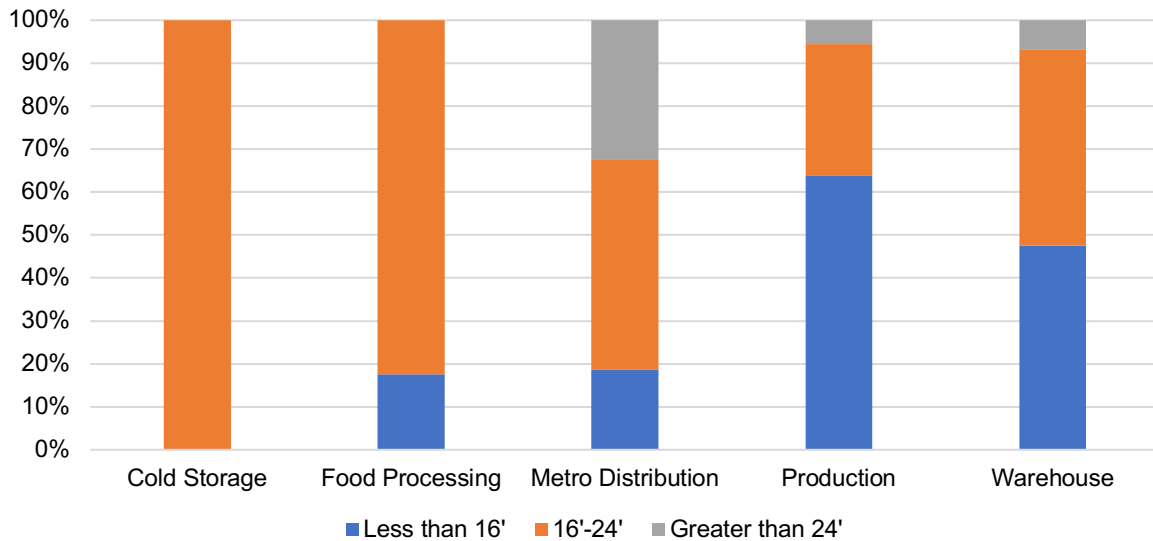


Figure 13: RBA by Type and Number of Loading Docks per 100,000 SF

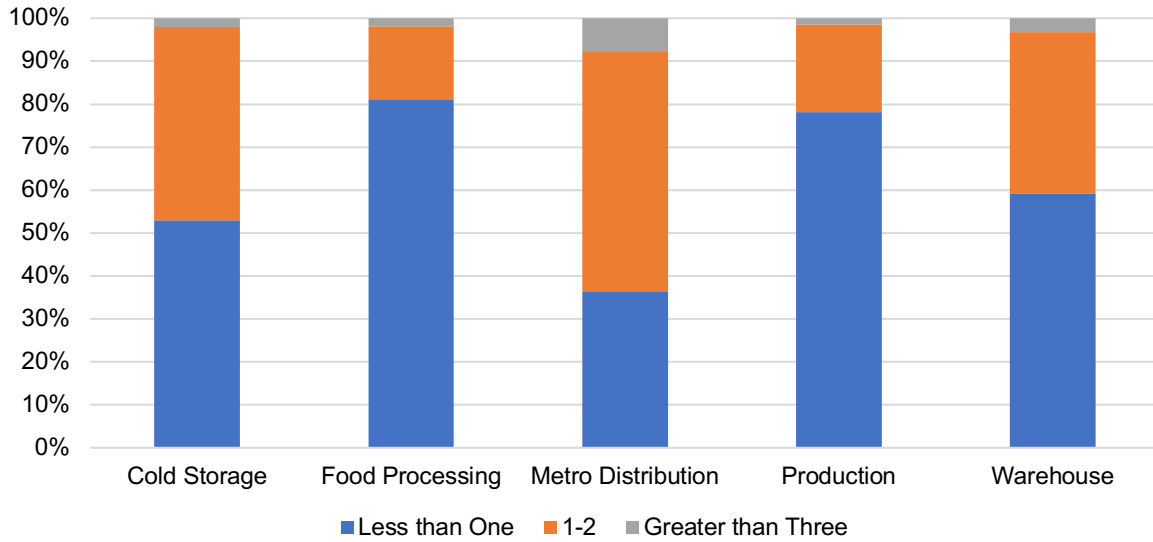


Figure 14: RBA by Type and Number of Loading Docks per 10,000 SF in NYC

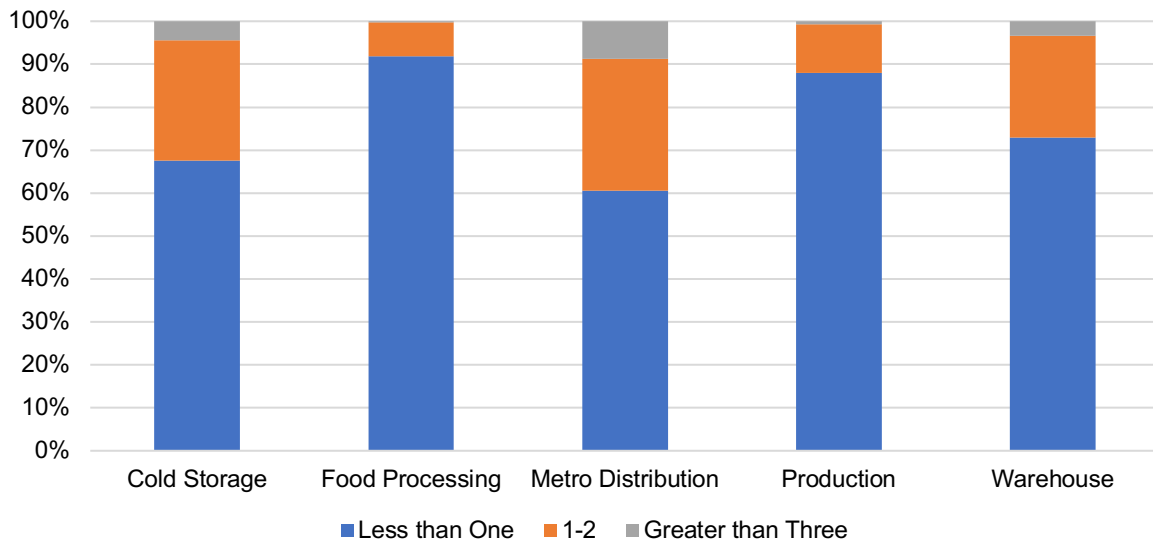


Table 10: Under Construction and Proposed Buildings by Municipality

Municipality Name	State	Count of Buildings	Total Sum RBA	Average RBA of Buildings
Bergen County	NJ	1	4,309	4,309
Bronx County	NY	6	2,077,707	346,285
Capitol Region COG	CT	3	33,400	11,133
Connecticut Metropolitan COG	CT	6	764,540	127,423
Essex County	NJ	1	30,005	30,005
Hudson County	NJ	13	2,650,030	203,848
Hunterdon County	NJ	3	144,777	48,259
Kings County	NY	11	2,455,155	223,196
Lehigh County	PA	17	7,430,408	437,083
Middlesex County	NJ	6	322,805	53,801
Monmouth County	NJ	12	1,257,818	104,818
Morris County	NJ	3	112,940	37,647
Nassau County	NY	2	430,844	215,422
Naugatuck Valley COG	CT	4	170,000	42,500
New York County	NY	2	36,549	18,275
Northampton County	PA	20	7,448,659	372,433
Ocean County	NJ	1	25,605	25,605
Orange County	NY	11	3,692,824	335,711
Passaic County	NJ	2	141,111	70,556
Putnam County	NY	5	623,000	124,600
Queens County	NY	3	528,050	176,017
Richmond County	NY	1	70,000	70,000
Rockland County	NY	12	1,987,047	165,587
Somerset County	NJ	10	1,278,997	127,900
Suffolk County	NY	1	11,130	11,130
Union County	NJ	12	4,276,676	356,390
Warren County	NJ	3	2,181,900	727,300
Westchester County	NY	5	93,598	18,720
Western Connecticut COG	CT	11	772,814	70,256

Table 11: Recently Constructed Buildings by Municipality

Municipality Name	State	Count of Buildings	Total Sum RBA	Average RBA of Buildings
Bronx County	NY	2	493,530	246,765
Connecticut Metropolitan COG	CT	2	386,358	193,179
Hudson County	NJ	13	2,275,575	175,044
Kings County	NY	5	813,027	162,605
Lehigh County	PA	19	8,578,751	451,513
Middlesex County	NJ	15	1,434,041	95,603
Monmouth County	NJ	3	229,983	76,661
Morris County	NJ	4	504,016	126,004
Naugatuck Valley COG	CT	4	639,424	159,856
New York County	NY	1	397,893	397,893
Northampton County	PA	42	16,553,873	394,140
Ocean County	NJ	2	144,000	72,000
Orange County	NY	8	1,541,270	192,659
Passaic County	NJ	2	600,753	300,377
Putnam County	NY	1	56,250	56,250
Queens County	NY	2	540,000	270,000
Richmond County	NY	4	3,255,000	813,750
Somerset County	NJ	11	3,442,878	312,989
Union County	NJ	11	2,748,738	249,885
Warren County	NJ	4	2,177,554	544,389
Westchester County	NY	3	495,067	165,022