



Business

The WalkUP

Wake-Up Call:

New York

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CENTER FOR REAL ESTATE & URBAN ANALYSIS
THE GEORGE WASHINGTON UNIVERSITY SCHOOL OF BUSINESS

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INTRODUCTION

Walkable urban places (or “WalkUPs”) in the New York-New Jersey-Connecticut tri-state region are centers of both economic vitality and social inclusion.

Policy makers, real estate professionals, environmentalists, and community advocates have common cause in increasing the supply of walkable urban places—places that will grow and expand the region’s economic development, social equity, and environmental sustainability.

During the late 20th century, real estate practitioners, observers, and scholars studying land use looked through a city-versus-suburban lens. This lens has created a bias in understanding metropolitan development trends.

It is not unlike the classic social science joke about the tipsy guest who drops his keys by the front door as he leaves a party. He searches for his keys under a streetlight at the curb and he is asked, “Why aren’t you looking where you lost your keys?” He replies, “This is where the light is.” This research casts a light on where and how households and businesses are actually living, working, and thriving in the 21st century.

dispersed throughout the region, and low-density drivable development in both the central city and the suburbs. Developers, public officials, and advocates need a new way to talk about urbanization that includes both town and country, and understands that walkable urban communities everywhere can both have economic growth and social equity.

To capture this nuance, it is necessary to create new definitions of place that reflect the economic and social realities of today. Standard data sets at census tract or county levels are not sufficient to understand what is driving development trends. Therefore, our research is based on our own custom, data-driven geographic boundaries. These boundaries reflect the distinct ways people are using real estate today and map the entire 31-county New York-New Jersey-Connecticut

The city-versus-suburban dichotomy misses the nuance that metropolitan regions have nodes of walkable urbanism

tri-state region, as defined by the Regional Plan Association (RPA).¹

We overlay this new geography of walkability with novel combinations of public and private datasets to find new insights, including:

- A census of nearly 100 percent of the metropolitan real estate market in all product types (office, residential, retail, industrial, owner-user, hotel, etc.), including an estimate of owner-user space as a discrete product type
- Identifying emerging and potential walkable urban places
- Real estate valuation at the location and place level
- Gross regional product (GRP)² at the location and place level, rather than just the metropolitan level
- Place and location-based social equity measurement

Executive Summary

The New York-New Jersey-Connecticut metropolitan region has some of the most iconic and globally significant walkable urbanism on the planet. Previous George Washington University research³ showed that the tri-state region ranks as the most walkable urban metro area of the largest 30 metropolitans in the United States.

However, the tri-state region contains significant amounts of low-density drivable development. The region has very little walkable urbanism outside of the urban core, in contrast to other metropolitan areas like Boston and Washington, D.C. It is certainly a “tale of two metropolitan areas.”

As the country’s largest metro region, the tri-state region is home to 22.6 million residents and 10.4 million jobs across 12,800 square miles—a land mass larger than Maryland. If the region were a state, its employment base and gross regional product (GRP) would be the third largest, behind California and Texas.

The region contains globally significant walkable urban places such as Lower and Midtown Manhattan. However, the future of the tri-state region goes beyond only developing walkable urbanism in New York City. It must also include fostering and growing walkable urbanism throughout the rest of the region. The region’s walkable urbanism presently occurs in only 2.5 percent of the region’s land. And, this 2.5 percent of land is home to 42 percent of the population, and holds 31 percent of the region’s real estate square footage and 53 percent of its \$6 trillion in real estate market value.

Consistent with George Washington University (GWU) research in other metropolitan areas,⁴ real

estate products located in walkable urban places have a substantial valuation premium in the tri-state region. This research analyzed many product types, including office, retail, industrial, hotel, rental apartments, and for-sale housing. We find that real estate products have higher values per square foot in walkable urban places than in drivable locations—a 150 percent premium, or 2.5 times higher, on a per square foot basis.

Prior nationally focused GWU research published in *Foot Traffic Ahead 2016*⁵ shows that, for the first time in at least a half century, walkable urbanism is gaining in all 30 of the largest U.S. metropolitan areas—and that it demands significant rental premiums. These trends also hold in the tri-state region. Over the most recent real estate cycle from 2010 to 2016, walkable urbanism has gained new leasing activity 1.9 times faster than its market share in 2010 at the beginning of this cycle.

The tri-state region contains the most extensive rail transit and commuter rail network in the country. In the tri-state region, 130 of the 149 walkable urban places (87 percent) are located within a half-mile of a rail transit or commuter rail station. Increasing walkable urbanism leverages this investment and also provides benefits to those seeking to locate in a place where they can walk and use transit to get to their destination.

The most contentious issue in the tri-state area is social equity, particularly the impacts of gentrification. Counter-intuitively, this research shows that the most walkable urban places in the region are also the most socially equitable. For low-income families, however, “the rent is still too damn high.”

Our prior national research also found a correlation between walkable urbanism and two economic factors: regional educational attainment and GRP per capita.⁶ This study further explores these trends within the tri-state region. Our research allocates the region’s annual GRP (\$1.17 trillion) to the “place level” for the first time; we estimate that the 2.5 percent of walkable urban land produces 56 percent of the region’s GRP. This research also finds that increased economic activity is correlated with Walk Score®: a one percent increase in Walk Score is correlated with a 0.6 percent increase in GRP per employee in walkable urban places.

The tri-state region has pent-up market demand for substantially more walkable urbanism, but there are challenges ahead. The region has the largest transit-dependent population (40 percent of all commuting trips), but the rail and bus transit system is woefully under-maintained and has barely expanded for generations. This underscores the need for continued investment in transit infrastructure.

Marquee projects of regional significance include:

- **Gateway Program** to add Hudson River tunnel capacity for Amtrak and New Jersey Transit trains
- **East Side Access** to connect Long Island Rail Road (LIRR) tunnels in Queens to Grand Central Station
- **Second Avenue Subway**
- **Number 7 Line Extension**
- **New Tappan Zee Bridge**, with the addition of enhanced bus service connecting Rockland and Westchester Counties

The findings below quantify the interaction between the two development forms—walkable urban and drivable sub-urban—and economic performance and social equity.

KEY FINDINGS

- **Walkable urban places produce most of the region’s economic GRP.** Due to the high concentration of employment in these places, particularly the concentration of highly educated knowledge employees, walkable urbanism accounts for 55.6 percent of the region’s GRP.
- **The tri-state region has 19 billion square feet of real estate, which has a market value of \$6 trillion.** This is the first time this assessment has been made for metropolitan New York, or for any metro area in the world. The market value of all walkable urban real estate is \$3.2 trillion, or 53.4 percent of the regional total.
- **The tri-state region’s real estate market, like other markets we have studied, has substantial pent-up demand for walkable urbanism, demonstrated by significant real estate market valuation premiums for walkable urban real estate over drivable sub-urban in all product types.**

With some of the most valuable real estate on the planet, the tri-state region leads other metropolitan regions we have evaluated in many indicators of real estate value, especially in price premiums. This study also marks the first market value estimate of real estate across all product types in the tri-state region. The average square foot of walkable urban real estate in the region is valued at \$541, a 150 percent premium compared to drivable sub-urban real estate in the region.

These premiums are considerably different for specific product types, as shown below.

The Q3 2016 market valuation premiums of walkable urban product types, compared to drivable sub-urban, are:

• OFFICE	359%
• RETAIL	162%
• INDUSTRIAL	154%
• HOTEL	384%
• RENTAL APARTMENTS	236%
• FOR-SALE RESIDENTIAL	69%
• TOTAL, all product types	150%

- **Market share of income-producing walkable urban real estate (all product types except for-sale housing, due to lack of 2010 data) in the tri-state region increased substantially during this real estate cycle (2010 to 2016), while drivable sub-urban lost market share.**

Walkable urbanism started with 52 percent of regional square footage in January of 2010, yet its share of net absorption was 90 percent, demonstrating substantial market share growth. Walkable urbanism gained 1.9 times its market share across all product types.⁷

This trend is the reverse in drivable sub-urban income real estate products—all lost relative market share in this cycle, and office and retail lost absolute occupancy. Drivable sub-urban office and industrial parks have been particularly impacted by this loss of occupancy.

- **In measuring social equity, as defined by the combination of affordable living and access to job opportunities, we find that there is, surprisingly, not a trade-off between social equity and economic performance.** In fact, we find that in walkable urban places, there is a positive correlation between economic performance and social equity, as these places provide more transit access, lower combined transportation and housing costs, and greater opportunity. It is in drivable sub-urban locations, however, where we see a trade-off: as economic performance increases for places like office parks and regional malls, social equity tends to decrease.

This tells us that walkable urbanism helps reconcile the tension between economic performance and social equity when mixed-income communities allow residents of all incomes to benefit. It is important to note that these measures do not capture all components of social equity. For example, they do not measure important qualities such as access to good schools, safe streets, or healthy environments.

- **Many walkable urban places are at risk of becoming too expensive for low and moderate-income households.** In analyzing population trends, RPA found that high-income populations are increasingly moving into walkable, job-accessible areas, while lower-income populations are increasingly leaving. Households making more than \$100,000 annually increased by 160,000 in these areas, while households making less than \$100,000 decreased by 61,000. This speaks to the current demand for walkable urbanism, and the need to invest in creating more walkable urban places available to all income levels.⁸

ECONOMIC PERFORMANCE FINDINGS

- **Walkability is associated with increased GRP per employee. In walkable urban places, we find that a one-point increase in Walk Score⁹ above 70 is associated with an increase of between \$615 and \$692 in GRP per employee.** Walkable urbanism is associated with “agglomeration economies,” the phenomenon that companies are more productive in dense, urban environments where they can attract top talent and share knowledge with other firms.¹⁰
- **Walkability is associated with higher valuation per square foot in all real estate products. In walkable urban places, we find that a one-point increase in Walk Score above 70 is associated with a per-square-foot increase between \$4.89 and \$11.20 in market valuation.** This illustrates the pent-up demand for walkable urbanism throughout the tri-state region.
- **Our Economic Performance Index (EPI) shows that the highest performing walkable urban places are concentrated in Manhattan, other parts of New York City, and the core of the region.** However, there are other top economic performers, such as downtown Greenwich, Conn.; Princeton, N.J.; and Great Neck, N.Y. We find that most Town Centers (downtowns often served by commuter rail) under-perform as compared to the regional WalkUP average, which indicates their tremendous potential to provide the region with economic growth.

SOCIAL EQUITY FINDINGS

- **Walkable urban housing costs for low-income households may be lower than drivable sub-urban housing costs, but “the rent is still too damn high.”** Across the region, housing costs consume more than 50 percent of the budget for low-income households making less than \$40,000 annually. The amount spent on housing should not exceed 30 percent.
- **Walkable urbanism areas have greater diversity, a higher share of low-income people, and lower racial segregation compared to drivable sub-urban areas.** The share of people of color ranges from 59 to 67 percent in walkable urban areas and 38 to 41 percent in drivable sub-urban areas. This is unsurprising, given past public policies that led to the concentration of people of color in central urban areas.

A similar pattern holds for low-income families. The share of families making less than \$40,000 annually is 46 to 48 percent in walkable urban areas, compared to 31 percent in drivable sub-urban areas. We also found less racial segregation in walkable urban places.
- **When we consider housing and transportation costs, walkable urbanism in the tri-state region is more affordable for a low-income family (at the 50th percentile of area median income) than drivable sub-urban.** For such a family—consisting of a single adult with two children, renting their home, and making approximately \$32,900 a year—walkable urban places in the region are, on average, 18 percent less expensive than drivable sub-divisions. Transportation costs, specifically, are 35 percent less expensive.

- **The walkable urban places ranked highest in social equity are concentrated in New York City.** Chinatown was the highest-ranked place by this measure, although a handful of places outside of Manhattan also ranked highly: Melrose Concourse, Bronx (#5); Fort Greene, Brooklyn (#10); Long Island City, Queens (#13); Downtown Newark (#22); and Journal Square, Jersey City (#34). These rankings are indicative of the high levels of transit accessibility, and subsequent transportation affordability, found in walkable urban places.

New York City and the core of the region perform highly in Social Equity Rankings primarily because of their combination of quality transit access and large amounts of rent-regulated, public, and subsidized housing. However, this is not to say that affordability is not a concern. There is an overall trade-off between transit access and housing affordability, a trend that has been slowly increasing in the tri-state region. Policy makers will need to put in place efforts to preserve and grow affordable housing in transit-accessible neighborhoods if the region is to remain a place where walkable urbanism remains within reach for a wide range of people.

LAND USE DEFINED

A New Lens for Understanding the Tri-State Region

The city-versus-suburban dichotomy is obsolete. Walkable urban versus drivable sub-urban is more relevant in the 21st century.

For decades, real estate practitioners, observers, and scholars studying land use have looked through an urban-versus-suburban lens. This research applies an analytical framework that replaces the city-versus-suburb dichotomy with a new lens by dividing each metropolitan area into two broad categories:

- DRIVABLE SUB-URBAN:** This development form has the lowest density in the more than 6,000 years of urban history.¹¹ It features stand-alone real estate product types, with office, retail, for-sale residential, rental apartments, hotel, and industrial properties generally separated from each other. It also tends to be socially and racially segregated, and relies upon cars and trucks as the only viable forms of transportation. This almost

exclusive use of automobile transportation, combined with the substantial land availability in the United States, results in expansive land use, generally referred to as sprawl.

- WALKABLE URBAN:** This form of development has much higher density, with multiple real estate product types in close proximity or within the same property, and usually employs multiple modes of transportation that get people and goods to the place. Once there, nearly everything is within walking distance.

The tri-state region is 12,800 square miles in land area and includes 22.6 million people and 10.4 million jobs. See the overview maps on pages 22 through 24.

Both drivable sub-urban and walkable urban forms of development have market support and appeal in the tri-state region—and throughout the country. Each form is found in both New York City and its suburbs. Within the New York City limits, which span 305 square miles (2.4 percent of the region), there are many examples of walkable urbanism, such as Lower Manhattan, Downtown Brooklyn, and Astoria, Queens. However, much of the city is drivable sub-urban, like most of Staten Island, many parts of Queens, and even some areas in Brooklyn and the Bronx. Conversely, sub-urban areas of the region contain many examples of walkable urbanism—like the downtowns of Stamford, Conn; Poughkeepsie, N.Y.; and New Brunswick, N.J.—as well as vast amounts of drivable sub-urbanism.

Stats:

REGIONAL LAND AREA	12,800 <i>sq. mi.</i> > State of Maryland	REGIONAL JOBS	10.4 <i>million</i>
NEW YORK CITY LAND AREA	305 <i>sq. mi.</i>	GROSS REGIONAL PRODUCT (GRP)	\$1.17 <i>trillion</i> = 7% of U.S. GDP (Only California and Texas are larger)
REGIONAL POPULATION	22.6 <i>million</i>	REGIONAL REAL ESTATE INVENTORY	18.8 <i>billion sq. ft.</i>
NEW YORK CITY POPULATION	8.4 <i>million</i>	REAL ESTATE MARKET VALUE	\$5.98 <i>trillion</i> > 30% of Market Cap of NYSE and NASDAQ combined

2014 Data

Form Meets Function

Two potential economic functions and two land use forms yield a four-cell matrix that categorizes 100 percent of metropolitan land.

This research defines—in a new way—the economic function of all land use in metropolitan areas, as either regionally significant or local serving.

- REGIONALLY SIGNIFICANT:** Places where the following cluster: Export or base employment, civic functions, cultural assets, entertainment, regional retail, higher education, major hospitals,

and one-of-a-kind facilities such as stadiums and arenas. They also tend to include much of the wealth-creating functions that bring new cash into the economy—the functions that are the primary reasons the metropolitan area exists.

- LOCAL SERVING:** Primarily bedroom communities where the majority of the housing in the

metropolitan area is located. An average of two-thirds of local serving walkable urban places and drivable sub-urban locations are comprised of residential development. Much of the rest is “support commercial,” such as primary and secondary education, supermarkets, local doctors and dentist offices, and local government. However, particularly in drivable sub-urban locations, there are isolated regionally significant places, referred to as “edgeless cities,”¹² with office, industrial, and owner-user space.

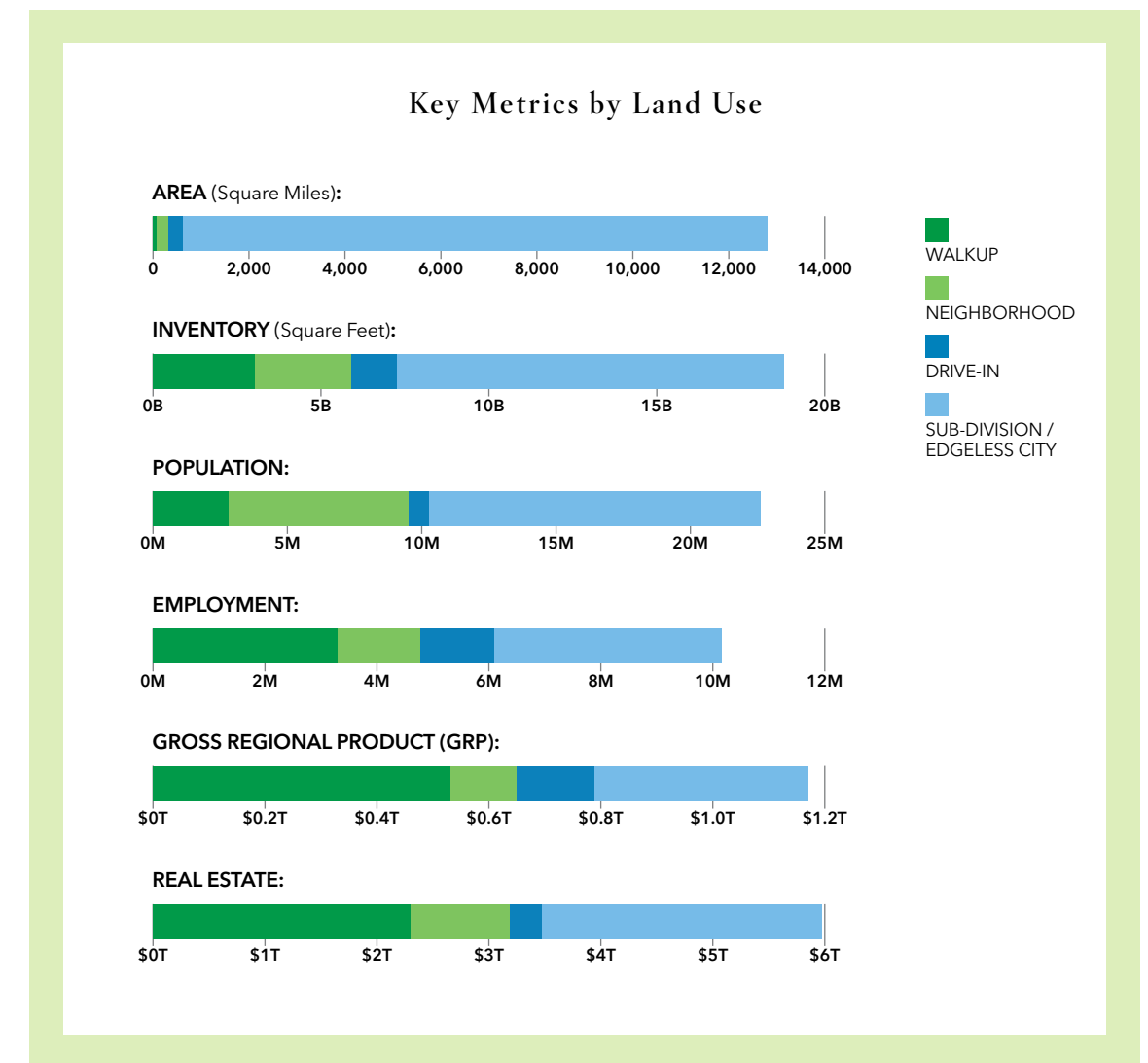
state region is, instead, drivable sub-urban. In fact, at 1,767 people per square mile, the tri-state region is less dense than metropolitan Los Angeles (2,645 people per square mile). Outside of New York City, the region has about half the overall average density, at 905 people per square mile.

By applying this four-cell Land Use Form/Economic Function framework, we aim to uncover trends not generally understood by using the old urban-versus-suburban dichotomy. We have observed in the metropolitan areas of Atlanta,¹³ Boston,¹⁴ Detroit,¹⁵ and Washington, D.C.¹⁶ that the pendulum was strongly swinging toward producing new drivable sub-urban development during the second half of the 20th century. However, since the mid-1990s, we have seen the pendulum swing back toward walkable urbanism, the land use form of the 19th and early 20th centuries. This trend toward walkable urbanism has been further supported by findings in *Foot Traffic Ahead 2014*¹⁷ and *Foot Traffic Ahead 2016*.¹⁸ In these previously analyzed regions, walkable urban places are gaining market share of new development and seeing substantial price and rent premiums over their drivable sub-urban counterparts. Our findings in this study show a similar trend toward walkable urbanism in the tri-state region.

These two factors form the four-cell Form/Function Matrix: Metropolitan Land Use Options, shown at the left. For this study, we assigned all land in the tri-state region to the appropriate cell using geographic information systems (GIS) software:

- WALKUP:** Regionally Significant and Walkable Urban
- NEIGHBORHOOD:** Local Serving and Walkable Urban
- DRIVE-IN:** Regionally Significant and Drivable Sub-Urban
- SUB-DIVISION/EDGELESS CITY:** Local Serving and Drivable Sub-Urban

The amount of the tri-state region’s landmass for each of the four land use options is shown in the matrix. Only 2.5 percent of the total regional land mass is walkable urban. This finding may come as a surprise, given the region’s fame as the home of one of the largest and most walkable cities in the world: New York City. The vast majority of land in the tri-



Methodology

The methodology employed in this report has its basis in research described in the Brookings Institution report, *Walk This Way*,¹⁹ and in prior GW School of Business *WalkUP Wake-Up Call* reports.

Specifically, this methodology was used and further refined during research conducted for *WalkUP Wake-Up Call* reports focused on the metro areas of Atlanta,²⁰ and Boston,²¹ and Washington, D.C.²² Additionally, we used this methodology in *Foot Traffic Ahead 2016*²³ and *Foot Traffic Ahead 2014*.²⁴

This report is the culmination of the research team’s efforts to synthesize several data sets on the built environment, and it constitutes the most comprehensive inventory of real estate in the tri-state region to date.

DEVELOPING GEOGRAPHIC BOUNDARIES:

To identify the boundaries of the WalkUPs, Walkable Neighborhoods, Drive-Ins, and Drivable Sub-divisions, we engaged in a rigorous process that combined quantitative data with “ground-truthed” qualitative information from interviews with local experts. The overall process to identify the boundaries consisted of six steps, and begins with the criteria established in *Walk This Way*.²⁵

To be considered an established WalkUP, each candidate had to meet the following criteria:

- **WALK SCORE®:** Average value ≥ 70.5
- **INTERSECTION DENSITY:** Average ≥ 100 per square mile
- **OFFICE & RETAIL SPACE:**
 - **Office:** ≥ 1.4 million square feet and/or
 - **Retail:** ≥ 340,000 square feet

With these criteria in mind, the research team assembled several data sets and conducted detailed GIS analysis in the tri-state region using a six-step process:

1. **Identify Walkable Urbanism.** RPA previously established a half-mile grid of the entire tri-state region for planning purposes in the Fourth Regional Plan. We used this same grid, and refined it to a quarter-mile grid level in dense urban areas. We then compiled Walk Score data for more than 74,000 unique points in the tri-state region. By filtering these points using the Walk Score criteria of over 70.5, we created an initial overview of walkability in the region.
2. **Create Initial WalkUP Candidates.** Using the Walk Score grid data, we combined boundaries of census blocks, as well as a sense of natural neighborhood boundaries that we identified in expert ground truth interviews. This process yielded an initial candidate set of WalkUPs.
3. **Refine WalkUP Candidates.** We further refined the first cut of WalkUPs using intersection density from the U.S. EPA Smart Location Database.²⁶ This ensured that areas with high Walk Score, but lacking in walkable infrastructure, were not falsely identified. Again, these WalkUPs were even further refined through our iterative process of ground truth interviews.
4. **Identify Regional Significance.** Regionally significant places are defined as those with at least 1.4 million square feet of office space and/or 340,000 square feet of retail space. Using data from CoStar™, we identified the WalkUP candidates that were regionally significant. We

were then able to identify locations that were walkable, but not regionally significant. These areas became the Walkable Neighborhoods.

5. **Identify Drive-Ins.** Using CoStar data, together with census block-level data from the U.S. Census Longitudinal Employer Household Dynamics (LEHD)²⁷ survey, the research team identified places that were drivable sub-urban, but exhibited regionally significant levels of economic activity in the form of real estate volume and job clustering. We further refined the Drive-In boundaries with ground truth interviews.
6. **Finalize Boundaries.** Having established boundaries for WalkUPs, Walkable Neighborhoods, and Drive-Ins, we further vetted the candidate boundaries with another set of ground truth interviews. The results of this process were the finalized boundaries for these three land use options. We classified the remaining land in the region as Drivable Sub-division, the bottom left quadrant of the land use option matrix on page 10.

ECONOMIC RANKINGS: METHODOLOGY & SOURCES

We aggregated time-series, building-level information from CoStar to our defined geographies to generate the analysis of rent premiums and valuations. The data from CoStar included inventory in square feet, vacancy rates, net absorption, capitalization rates (cap rates), and average rents.²⁸

WALKUP MARKET VALUATIONS:

To develop real estate estimated market valuation for a WalkUP or other geographic area, we utilized the inventory, rents, cap rates, and expense ratios.²⁹ CoStar reported the cap rates at the geographic unit of analysis in this report.³⁰ We further supplemented the CoStar cap rates with cap rates reported in transaction data from Cushman and Wakefield, who also provided operating ratios.³¹

Market valuation for each product type, in a given geography, is a function of the average rents per square foot for each product type, the cap rates, and expense ratio, as seen in the equation below. To be clear, these market valuation estimates represent averages based on sample data reported by CoStar and Cushman and Wakefield. Individual transaction values may deviate significantly from these estimates.

$$\text{MARKET VALUATION}_{PG} = \frac{\text{Inventory}_{PG} \times \text{Annual Rental Rate}_{PG} \times \text{Expense Ratio}_{PG}}{\text{Cap Rate}_{PG}}$$

P = Product Type
G = Study Geography

We used data from Redfin for for-sale residential inventory and market valuations at each geography. This included the aggregate Redfin Estimate, and aggregate square footage for the geography.³² We went on to supplement the Redfin data in Manhattan using New York City assessment data.³³

OWNER-USER SPACE:

Owner-user space, which consists of space owned by the same entity that occupies the space, does not otherwise appear in the CoStar database. Examples of owner-user space include government buildings, universities, non-profits, and buildings fully owned by a company, such as a corporate headquarters. We imputed other owner-user space by validating CoStar data against assessment databases.³⁴ Finally, we used U.S. General Service Administration inventory data for federal government space.³⁵

GROSS REGIONAL PRODUCT (GRP):

This analysis represents the first use of place-based GRP. We used two data sources to develop estimates of GRP per job. Total employment data at the two-digit North American Industry Classification System (NAICS) level is from the U.S. Census Longitudinal Household Employment Database at the census block level.³⁶ Secondly, the Minnesota IMPLAN Group’s IMPLAN database provides value-added³⁷ and employment data at the county level for all two-digit NAICS industries.

The first step was to identify the employee productivity ratios for all 31 counties in the tri-state region, by two-digit NAICS industry, which is the value added divided by employment:

$$\text{PRODUCTIVITY}_{CN} = \frac{\text{Value Added}_{CN}}{\text{Employment}_{CN}}$$

C = County
N = 2-Digit NAICS Industry

Secondly, we applied those productivity rates against the employment at each geography by two-digit NAICS industry. The sum of all the industries in a geography create the place-based GRP for that geography:

$$\text{GRP}_G = \sum_N \text{Employment}_{GN} \times \text{Productivity}_{CN}$$

G = Study Geography
C = County of Study Geography, G
N = 2-Digit NAICS Industry

This measure is more precise than using an average GRP-per-job ratio, because it accounts for the industry differences in each geography. We divide the total GRP for every geography by the total employment for the geography to arrive at its GRP per job.

SOCIAL EQUITY RANKINGS: METHODOLOGY & SOURCES

ACCESSIBILITY:

The accessibility measure used the Access to Jobs and Workers Via Transit Tool from the EPA Smart Location Database at the census block group level.³⁸

- **Jobs accessible by transit:** Total jobs reachable within a 45-minute transit and walking commute
- **Workers accessible by transit:** The employed population able to access the block group within a 45-minute transit commute from their home locations
- **Population accessible by transit:** The total population able to access the block group within a 45-minute transit and walking commute

AFFORDABILITY:

The affordability data was from the U.S. Department of Housing and Urban Development Location Affordability Portal at the census block group level.³⁹ For this analysis, we utilize a Reference Family, which consists of a single working adult with two dependents, at the 50th percentile of area median income, who rents their home.⁴⁰ This family, on average, makes approximately \$32,900 annually.

- **Housing Costs Are the Location Affordability Index (LAI):** Modeled annual reported housing costs for the Reference Family
- **Transportation Costs:** The LAI-modeled annual transportation costs for the Reference Family

OPPORTUNITY:

We used several data sources to measure opportunity. First, we developed a Housing Cost Ratio, which compares the housing costs modeled in the LAI against the 75th percentile reported rents in the U.S. Census American Community Survey.⁴¹

$$\text{HOUSING COST RATIO} = \frac{\text{LAI Housing Cost for Reference Family}}{\text{75th Percentile Housing Cost}}$$

Secondly, we calculated an Income Ratio measure to identify the discrepancy between moderate income population and high income population in each geography. This is defined as the ratio of the percent of the population making over \$200,000 annually, to the percent of the population making under \$40,000 annually. A high ratio is indicative of a disproportionate share of wealthy families compared to low-income families. This would also suggest an inability for the Reference Family to be able to find a housing unit in the geography due to market forces.

$$\text{INCOME RATIO} = \frac{\% \text{ Population Making More Than } \$200k}{\% \text{ Population Making Less Than } \$40k}$$

Finally, the last measure of opportunity is what we call “land use entropy,” which is a measure of land use mix at the census block group level by RPA.⁴² Land use entropy is a measure from zero to one that captures the mix of uses at a given location. A diversity of land uses provides a higher land use entropy, and areas with a predominance of one use, for instance mainly residential or mainly office, have a low measure of land use entropy. We consider this measure part of opportunity because a greater mix of uses affords a family greater amenities, housing choices, and services.

The Eight Types of WalkUPs

There are eight possible types of regionally significant walkable urban places in any metropolitan area. Five of these types are found in Metro New York.

There are eight types of possible WalkUPs in any metropolitan area:

- **Downtown**
- **Downtown Adjacent**
- **Urban Commercial**
- **Urban University**
- **Innovation District**
- **Town Center**
- **Redeveloped Drivable Commercial**
- **Greenfield/Brownfield**

Each type has a different history, product mix, and transportation infrastructure, though all are heading in the same direction as mixed-use, high-density WalkUPs.

We developed these classifications from previous research in Atlanta, Boston, Detroit, Grand Rapids, and Washington, D.C., and we have applied them in this study to the tri-state region. However, only five types of WalkUPs are represented in the tri-state region, we define below.

Currently, there are no established WalkUPs the tri-state region that we classify as Innovation Districts, Redeveloped Drivable Commercial, or Greenfields/Brownfields. However, our research indicates there are emerging and potential places that may take shape as these WalkUP types.

These three missing WalkUP types are among the many opportunities for additional growth in the region:

- **Innovation Districts:** Often co-located around universities, these WalkUPs are knowledge-economy, high-tech, maker, and software focused. A leading example is Kendall Square in Cambridge, Mass, which takes advantage of its proximity to MIT. As defined by the Brookings Institution, Innovation District are “geographic areas where leading-edge anchor institutions and companies cluster and connect with startups, business incubators, and accelerators. They are physically compact, transit-accessible, and technically wired, and they offer mixed-use housing, office, and retail.”⁴³ In the tri-state region, the currently under-construction Jacobs Technion-Cornell Institute on Roosevelt Island and Columbia University’s new Manhattanville campus in West Harlem have the potential of being its first Innovation Districts.
- **Redeveloped Drivable Commercial:** WalkUPs that originally developed as strip commercial and/or regional malls that have since been urbanized. Examples include the ongoing redevelopment of the formerly drivable commercial areas of Tysons, Va. into four separate WalkUPs; Buckhead and Perimeter Center in Metro Atlanta; and Denver’s Belmar, a WalkUP born out of the redevelopment of a failed regional mall in an inner ring suburb. This type of WalkUP is particularly suitable for the tri-state region, where there are many now-failing business parks and regional malls—and many examples throughout the country of successful redevelopment of such places.

- **Greenfield/Brownfield:** WalkUPs developed on Greenfields or reclaimed land, mainly formerly used for industrial purposes. Since upfront costs of this kind of redevelopment are so high—and because so many other WalkUP opportunities exist in the tri-state region—these should be avoided. However, there could be Brownfield redevelopment into a WalkUP. In redeveloping Greenfields and Brownfields, we should be sure not to follow outdated development models that do not result in walkable urbanism, such as the current plans for a massive regional entertainment complex in the Meadowlands.

In the tri-state region, the most common type of WalkUP is the Town Center, which comprises 47 percent of all 149 WalkUPs—but only six percent of the region’s WalkUP real estate inventory. Urban Commercial WalkUPs follow at 35 percent of the total number WalkUPs, and 39 percent of all WalkUP real estate inventory. The remaining tri-state WalkUPs consist of the core Downtown, Downtown Adjacent, and Urban University WalkUPs.

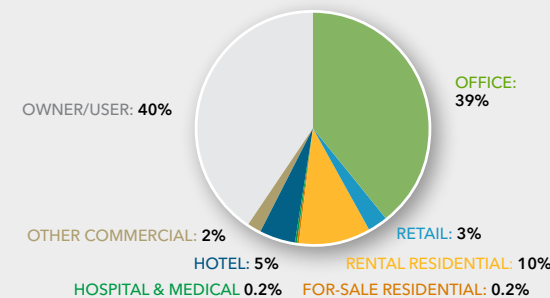
1 Downtown

Most metropolitan areas have just one Downtown. The tri-state region has many Downtowns, befitting the country's largest metropolitan area, the history of New York City, and the region's growth. We define Downtowns as the historic center of commercial activity for the region, yet there are nine in the this tri-state region analysis. We identified a WalkUP as a Downtown if there were Downtown Adjacent WalkUPs sparked by the overflow demand from the Downtown. This implies its critical mass of not only acting as a regionally significant place, but also spinning off demand for Downtown Adjacent places immediately attached to it.

As is typical of Downtowns throughout the country, multi-tenant office space is the dominant use (39 percent). In addition, much of the office space is owner-user (40 percent), comprised of government and corporate space. Historically, Downtowns had very little residential use, but since the early 21st century, residential has been the fastest growing product type. Currently, 10 percent of Downtown space is rental residential, though there is scant for-sale residential at this point. Downtowns also have the highest percentage of hotel square footage (five percent) of any WalkUP type. Retail occupies slightly less than three percent of the square footage.

WALKUP	COUNTY/BOROUGH	STATE
Downtown Brooklyn	Brooklyn	NY
Downtown Newark	Essex	NJ
Downtown Stamford	Fairfield	CT
Downtown Jersey City	Hudson	NJ
Lower Manhattan	Manhattan	NY
East Midtown	Manhattan	NY
Midtown	Manhattan	NY
Trenton	Mercer	NJ
Downtown White Plains	Westchester	NY

Product Mix: **Downtown**
Average % of Total Square Footage



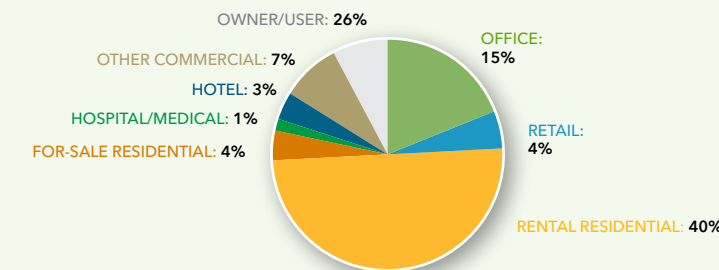
2 Downtown Adjacent

Immediately adjacent to and surrounding Downtowns, these WalkUPs usually have a lower density than Downtowns, and typically, each one possesses its own unique character. Fourteen Downtown Adjacent WalkUPs are found in the tri-state region. With almost equal portions of residential and office/retail space, they have a more balanced product mix of space than Downtowns. The result is usually a lively, nearly 24-hour environment.

Residential, particularly rental, occupies more than 43 percent of the square footage, while office and owner-occupied space makes up slightly less at 40 percent. This provides a more balanced portfolio of space allocation than Downtowns. Retail occupies four percent of all space, and hotels account for three percent; following Downtowns, hotels have their second-largest presence in Downtown Adjacent WalkUPs.

WALKUP	COUNTY/BOROUGH	STATE
Fort Greene	Brooklyn	NY
Brooklyn Heights	Brooklyn	NY
DUMBO	Brooklyn	NY
North Ironbound	Essex	NJ
South Stamford	Fairfield	CT
Journal Square	Hudson	NJ
Hoboken	Hudson	NJ
Lower East Side	Manhattan	NY
Hudson Yards / Hell's Kitchen	Manhattan	NY
Civic Center	Manhattan	NY
Upper West Side	Manhattan	NY
Tribeca	Manhattan	NY
Lexington Avenue Corridor	Manhattan	NY
Madison Ave.	Manhattan	NY

Product Mix: **Downtown Adjacent**
Average % of Total Square Footage



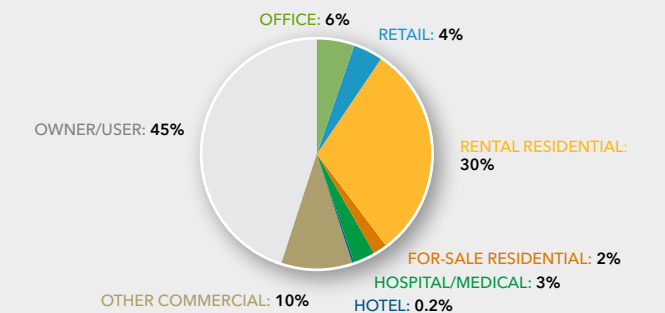
3 Urban University

Owner-user space—space occupied by anchor universities and other institutions, such as medical facilities or government research centers—is the dominant use of real estate square footage in Urban University WalkUPs (45 percent of total). This includes classrooms, laboratories, hospitals, general office, and dorms.⁴⁴ These landowners gauge the success of their development not in terms of the real estate valuation they may be able to achieve, but in their ability to attract talent like professors, doctors, students, and administrators.

The second largest use is off-campus rental apartments (30 percent). Retail occupies three percent of all space. The presence of these owner-user anchor institutions can also present opportunities for the development of Innovation Districts.

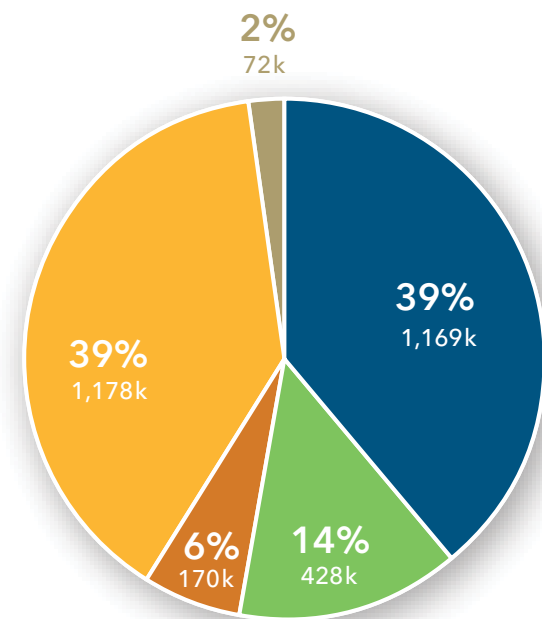
WALKUP	COUNTY/BOROUGH	STATE
Fordham-Belmont	Bronx	NY
Morningside Heights	Manhattan	NY
Princeton	Mercer	NJ
Yale University	New Haven	CT

Product Mix: **Urban University**
Average % of Total Square Footage



Tri-State Area WalkUP Real Estate Inventory: Percentage in Each Type

(And Quantity in Thousands of Square Feet)



- DOWNTOWN
- DOWNTOWN ADJACENT
- TOWN CENTER
- URBAN COMMERCIAL
- URBAN UNIVERSITY

4 Urban Commercial

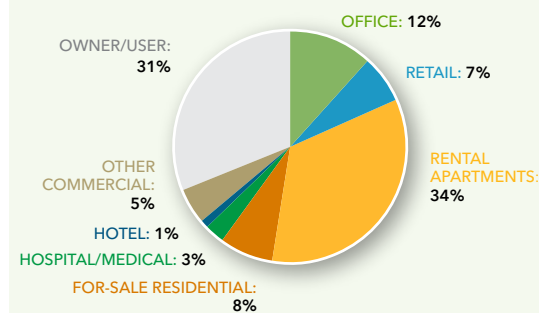
There are 52 Urban Commercial WalkUPs in the tri-state region, making it the second-most common type of WalkUP. Historically concentrations of local-serving commercial space, many Urban Commercial WalkUPs experienced economic decline after World War II. Some have regained their importance as concentrations of regional retail, while others have redefined themselves as concentrations of:

- **Technology** (Flatiron District)
- **The Arts** (Chelsea)
- **Urban Entertainment** (Meatpacking District)
- **Dining** (Cobble Hill)
- **Boutique Retail** (Union Square)

Urban Commercial WalkUPs have large concentrations of residential space (42 percent), especially rental apartments. They also have significant concentrations of owner-user space (31 percent).

Product Mix: Urban Commercial

Average % of Total Square Footage



WALKUP	COUNTY/BOROUGH	STATE
Melrose Concourse	Bronx	NY
Longwood	Bronx	NY
Burnside-Tremont	Bronx	NY
Westchester Square	Bronx	NY
Norwood	Bronx	NY
East Bronx	Bronx	NY
East Williamsburg	Brooklyn	NY
Williamsburg	Brooklyn	NY
Williamsburg South	Brooklyn	NY
Fulton St. Corridor	Brooklyn	NY
Flatbush	Brooklyn	NY
Sunset Park	Brooklyn	NY
Park Slope / Prospect Heights	Brooklyn	NY
Brownsville / Pitkin Ave.	Brooklyn	NY
Carroll Gardens / Cobble Hill	Brooklyn	NY
Kings Highway	Brooklyn	NY
Brooklyn College & The Hub	Brooklyn	NY
Brighton Beach / Coney Island	Brooklyn	NY
Bay Ridge	Brooklyn	NY
Chinatown	Manhattan	NY
East Harlem	Manhattan	NY
Central Harlem	Manhattan	NY
West Village	Manhattan	NY
Chelsea	Manhattan	NY
East Village	Manhattan	NY
Greenwich Village / NYU	Manhattan	NY

WALKUP	COUNTY/BOROUGH	STATE
SoHo	Manhattan	NY
Kips Bay Bellevue	Manhattan	NY
Flatiron / 23rd St.	Manhattan	NY
Inwood	Manhattan	NY
Nolita	Manhattan	NY
Meatpacking District	Manhattan	NY
Hudson / Washington Heights	Manhattan	NY
Hudson Square	Manhattan	NY
Second Avenue Corridor	Manhattan	NY
Manhattan Valley	Manhattan	NY
Union Square	Manhattan	NY
Kingsbridge	Manhattan	NY
Far Rockaway	Queens	NY
Sunnyside / Woodside	Queens	NY
Long Island City	Queens	NY
Bushwick	Queens	NY
Astoria	Queens	NY
Jackson Heights	Queens	NY
Jamaica	Queens	NY
Forest Hills / Rego Park	Queens	NY
Greater Flushing	Queens	NY
Bayside	Queens	NY
St. George	Staten Island	NY
Bay Street Corridor	Staten Island	NY
New Dorp	Staten Island	NY
Westfield	Union	NJ

5 Town Center

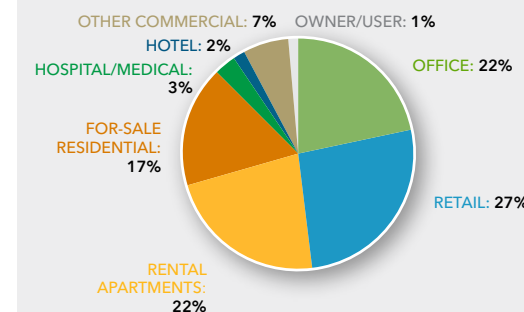
Town Centers are the downtowns of 18th- and 19th-century cities and towns that were swept up in the sprawl of their metropolitan areas. It therefore makes sense that this is the most common type of WalkUP in the tri-state region (70 out of 149). Laid out before the automobile, they initially developed independently and are characterized by walkable urban grids and historic buildings.

Following decades of decline in the late 20th century, many Town Centers are now finding a new economic role. In fact, a key finding of this study is that pent-up demand for walkable urbanism is the primary reason for their redevelopment, though NIMBY opposition has limited this to some degree.

Retail is the dominant product type (27 percent of square footage), which is many times the result of Main Street revitalization efforts. Rental apartments (22 percent) and for-sale residential (17 percent) is attracted to the close proximity of the retail, as well as the walkable streets and historic buildings. Office occupies a significant 22 percent of the space. Town Centers are among the most balanced of all WalkUP types.

Product Mix: Town Center

Average % of Total Square Footage



WALKUP	COUNTY/BOROUGH	STATE
Rutherford	Bergen	NJ
Fort Lee	Bergen	NJ
Englewood	Bergen	NJ
Downtown Teaneck	Bergen	NJ
Downtown Ridgewood	Bergen	NJ
Tenafly	Bergen	NJ
Downtown Poughkeepsie	Dutchess	NY
Downtown Beacon	Dutchess	NY
Downtown East Orange	Essex	NJ
Bloomfield Ave.	Essex	NJ
South Orange	Essex	NJ
Nutley	Essex	NJ
Downtown Norwalk	Fairfield	CT
Downtown Bridgeport	Fairfield	CT
Norwalk	Fairfield	CT
Downtown Greenwich	Fairfield	CT
Darien	Fairfield	CT
West New York	Hudson	NJ
North Union City	Hudson	NJ
South Union City	Hudson	NJ
Downtown Kearny	Hudson	NJ
New Brunswick	Middlesex	NJ
Downtown Perth Amboy	Middlesex	NJ
Asbury Park	Monmouth	NJ
Red Bank	Monmouth	NJ
Dover	Morris	NJ
Morristown	Morris	NJ
Hempstead	Nassau	NY
Rockville Center	Nassau	NY
Downtown Valley Stream	Nassau	NY
Great Neck	Nassau	NY
Cedarhurst	Nassau	NY
Downtown Long Beach	Nassau	NY
Glen Cove	Nassau	NY
Hewlett	Nassau	NY

WALKUP	COUNTY/BOROUGH	STATE
Port Washington	Nassau	NY
Downtown Garden City	Nassau	NY
Downtown Waterbury	New Haven	CT
Downtown New Haven	New Haven	CT
Downtown Meriden	New Haven	CT
Wallingford	New Haven	CT
Downtown Toms River	Ocean	NJ
Newburgh	Orange	NY
Downtown Middletown	Orange	NY
Downtown Passaic	Passaic	NJ
Paterson	Passaic	NJ
Clifton	Passaic	NJ
Nyack	Rockland	NY
Spring Valley	Rockland	NY
Patchogue	Suffolk	NY
Riverhead	Suffolk	NY
Huntington	Suffolk	NY
Kingston	Ulster	NY
Elizabeth	Union	NJ
North Plainfield	Union	NJ
Downtown Linden	Union	NJ
Downtown Summit	Union	NJ
Cranford	Union	NJ
Springfield Township	Union	NJ
Downtown Union	Union	NJ
Downtown Yonkers	Westchester	NY
Downtown Mount Vernon	Westchester	NY
New Rochelle	Westchester	NY
Downtown Tarrytown	Westchester	NY
Port Chester	Westchester	NY
Peekskill	Westchester	NY
Ossining	Westchester	NY
Bronxville	Westchester	NY
Downtown Scarsdale	Westchester	NY
Larchmont	Westchester	NY



LAND USE IN THE TRI-STATE REGION

MAP:

Where the WalkUPs Are in the Tri-State Region

MAP KEY:

LAND USE:

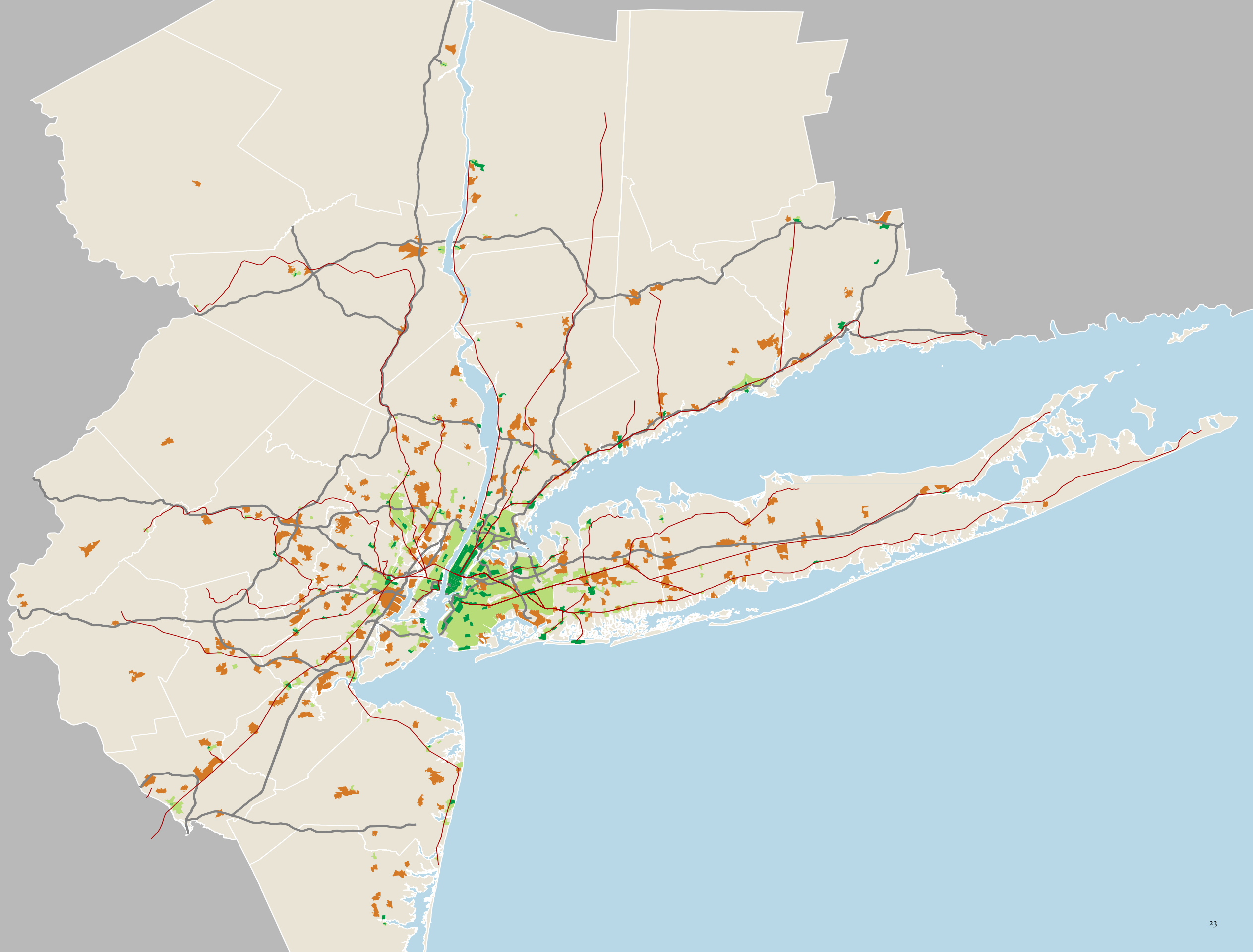
- WALKUP
- NEIGHBORHOOD
- DRIVE-IN
- SUB-DIVISION/
EDGELESS CITY

OTHER:

- RAIL TRANSIT
- MAJOR HIGHWAYS
- OUTSIDE STUDY AREA

VIEW MAP ONLINE:

<http://walkups.org/metrony/map>



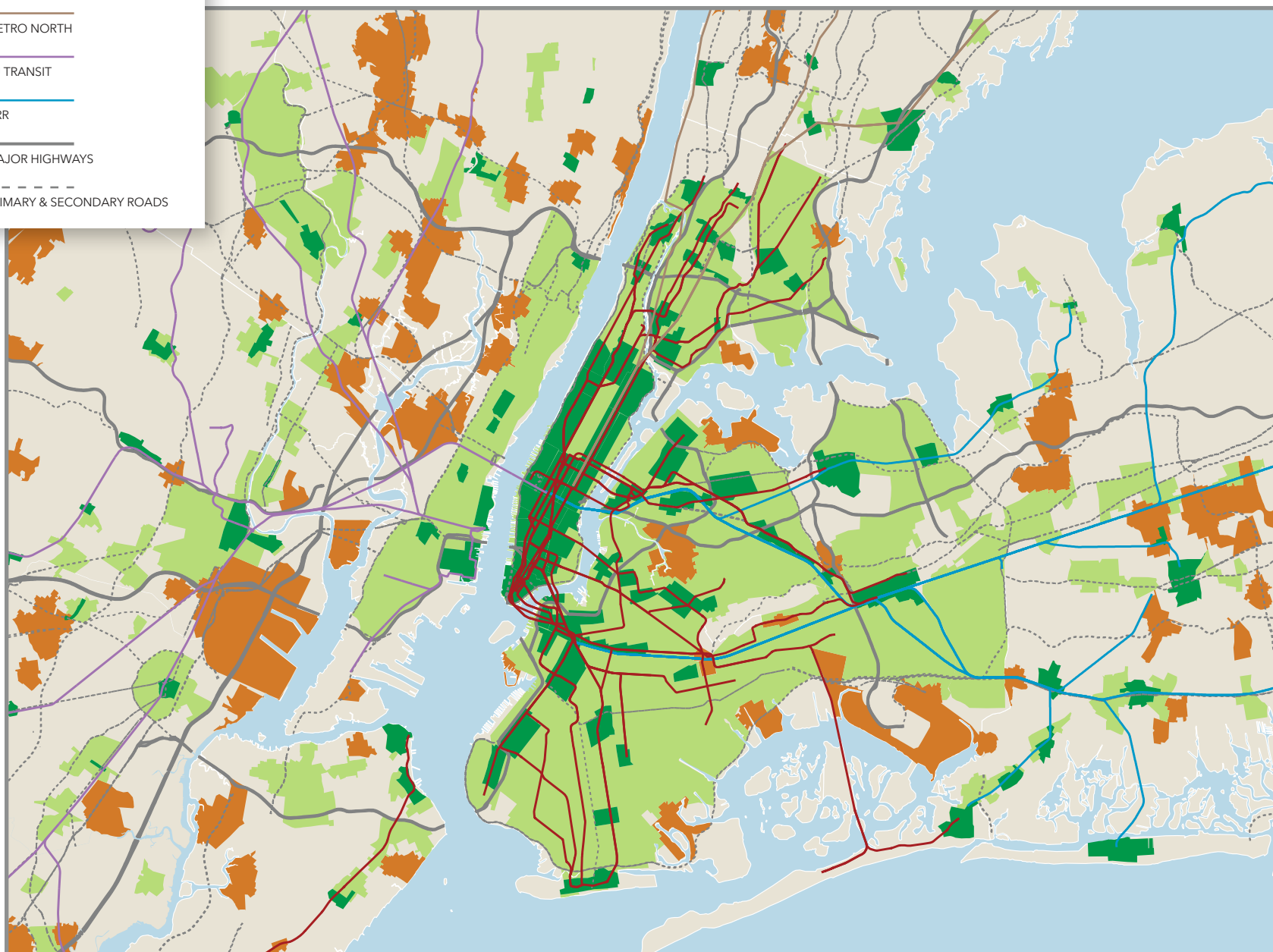
MAP KEY:

LAND USE:

- WALKUP
- NEIGHBORHOOD
- DRIVE-IN
- SUB-DIVISION/EDGELESS CITY

OTHER:

- NYC SUBWAY
- METRO NORTH
- NJ TRANSIT
- LIRR
- MAJOR HIGHWAYS
- PRIMARY & SECONDARY ROADS



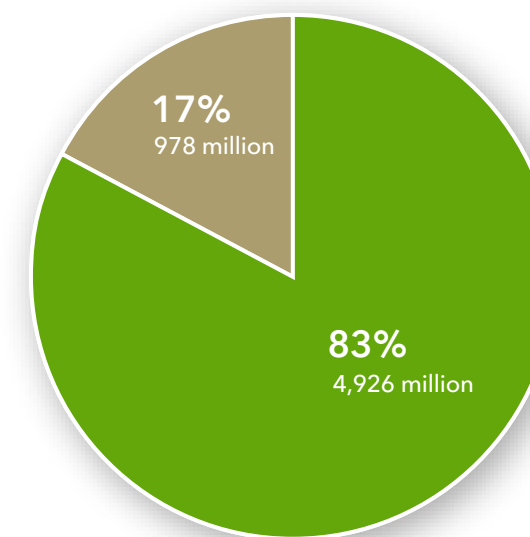
Geographic Findings

The tri-state region has more WalkUPs than any other region. However, many of these WalkUPs are concentrated in New York City, underscoring the need for more walkable urbanism in the rest of the region.

- **There are 149 established WalkUPs in the tri-state region in 2017.** This equates to one WalkUP for every 151,803 people in the region. The WalkUPs range in size from 33 acres to 989 acres (average is 273 acres) and account for 0.5 percent of the total land area in the tri-state region.
- **New York City contains most of the tri-state region's walkable urbanism.** Only 67 of the 149 WalkUPs (45 percent) are in New York City, with the remaining 82 elsewhere in the region. However, New York City constitutes 83 percent of all walkable urban square footage in the region. This indicates there is opportunity for development of more walkable urbanism outside of the region's core, which would create a greater balance of the walkable urban inventory throughout the tri-state region.
- **The region is served by the most extensive transit and commuter rail network in the United States, and 130 of the 149 WalkUPs (93 percent) are within a half-mile of a rail transit station.** The region contains 946 rail transit stations in six systems: MTA New York City Subway, MTA Metro North, MTA Long Island Rail Road (LIRR), Port Authority Trans Hudson rail (PATH), New Jersey Transit (NJT) heavy rail, and NJT light rail in Newark. These stations create significant opportunities for transit-oriented walkable urbanism.
- **WalkUPs and Drive-Ins together constitute the bulk of the metro area's regionally significant economic functions.** Together they contain 46 percent of the region's jobs—33 percent in WalkUPs and 13 percent in Drive-Ins—and constitute 72 percent of the tri-state region's non-residential space. This underscores that the majority of the region's base, or export jobs, are located in these areas—while only using 2.7 percent of the region's land.

Share of Walkable Urbanism in the Tri-State Region

(Millions of Square Feet)



■ NEW YORK CITY
■ REST OF REGION

Product Findings

For the first time ever, the size, share, and market value of all real estate products in the tri-state region have been tabulated.

BY PRODUCT MIX

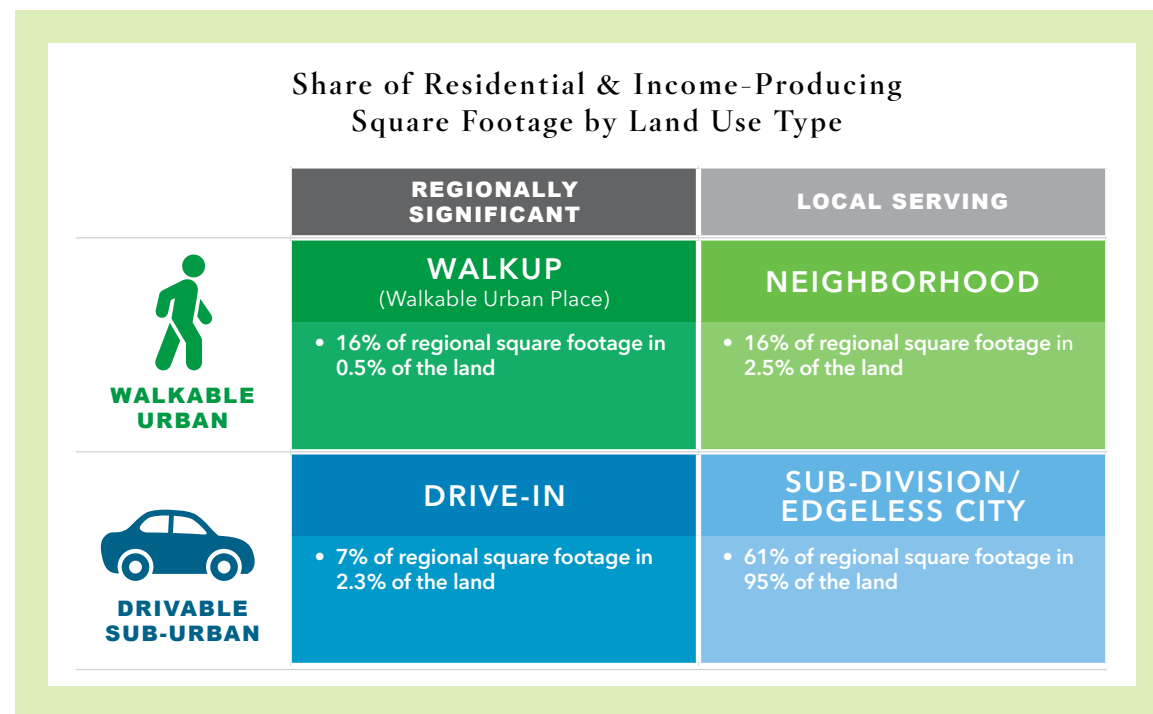
The 22 million people of the tri-state region occupy 18.8 billion square feet of space (a figure that has never been calculated), which is divided into ten product types.

The largest product type is for-sale residential (53 percent) and the third largest is rental apartments (11 percent), which, taken together, make residential 64 percent of the total square footage in the region. However, an unknown portion of for-sale residential is actually rented, as in the case of a single-family house rented out by its owner to another family.

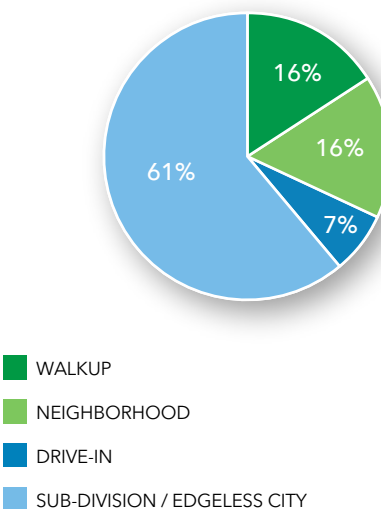
Product Type	Sq Ft	% of Total
FOR-SALE RESIDENTIAL	9,843 M	53%
RENTAL APARTMENTS	2,096 M	11%
OFFICE	1,308 M	7%
RETAIL	992 M	5%
INDUSTRIAL	1,293 M	7%
HOTEL	171 M	1%
FLEX/SPECIALTY	416 M	2%
HOSPITAL/MEDICAL	181 M	1%
OWNER-USER	2,462 M	13%
TOTAL	18,780 M	100%

The owner-user category is the least well understood, and it includes higher education, health care, government, corporate facilities, museums and cultural institutions, convention centers, and sports facilities. Since secondary data sources do not exist, we conducted primary research to estimate its size. Because this is the first attempt at quantifying owner-user space, we expect future tallies of this real estate product type will improve upon our estimate.

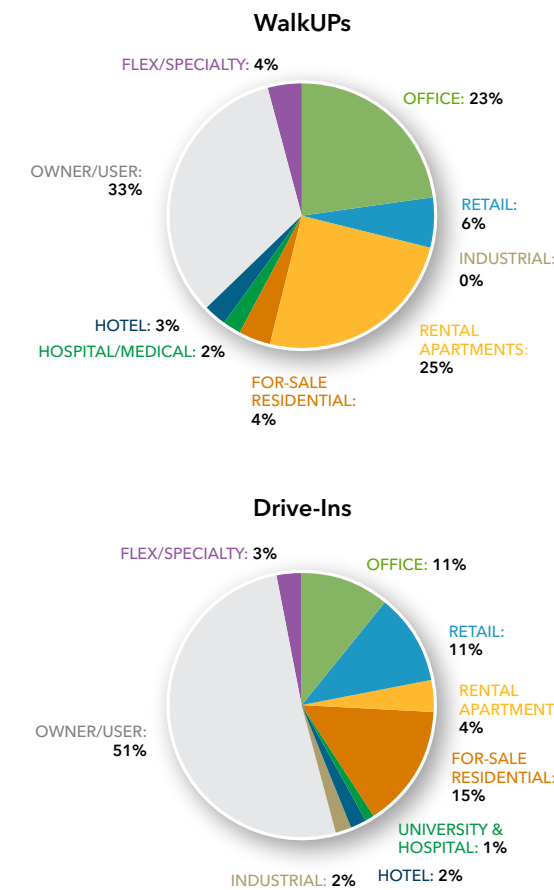
The 18.8 billion square feet in the region is divided into 12.9 billion that is drivable sub-urban (69 percent) and 5.9 billion that is walkable urban (31 percent), as shown below:



Share of Real Estate Square Footage by Land Use Form/Function Type



Share of Square Footage of Metropolitan Property Types in WalkUPs vs. Drive-Ins



PRODUCT TYPE VALUATION PREMIUMS

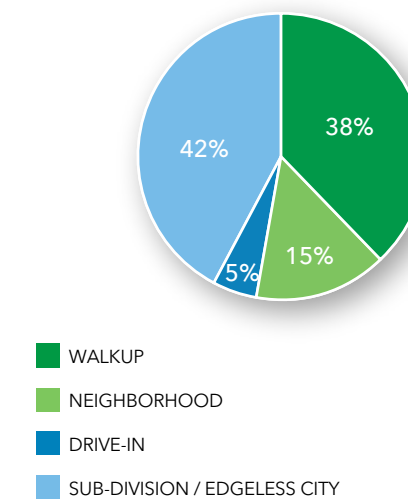
The total estimated market valuation of the region's real estate is \$6.0 trillion. For comparison, this is equal to approximately 30 percent of the capitalized corporate valuations of the New York Stock Exchange and NASDAQ, combined.⁴⁵ The region's \$6.0 trillion of real estate is divided into \$3.2 trillion that is walkable urban (53 percent), and \$2.8 trillion that is drivable sub-urban (47 percent), as shown below.

Sixty percent of the region's real estate value is in residential property. The next largest category is owner-user space at 18 percent, and office space at 10 percent.

Product Type	(\$ Billions)	% of Total
FOR-SALE RESIDENTIAL	\$2,638 B	44%
RENTAL APARTMENTS	\$949 B	16%
OFFICE	\$606 B	10%
RETAIL	\$282 B	5%
INDUSTRIAL	\$92 B	2%
HOTEL	\$90 B	2%
FLEX/SPECIALTY	\$140 B	2%
HOSPITAL/MEDICAL	\$75 B	1%
OWNER-USER	\$1,102 B	18%
TOTAL	\$5,976 B	100%*

* Note: Total difference due to rounding

Share of Real Estate Market Valuation by Land Use Form/Function Type

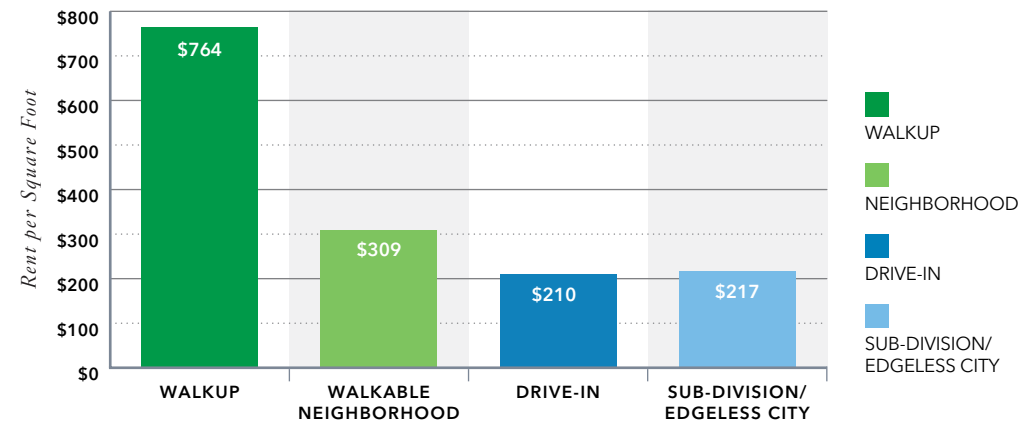


In terms of market value, walkable urban real estate is much more valuable per square foot than drivable sub-urban real estate. The average square foot of real estate in the tri-state region is valued at \$318. Drivable sub-urban real estate is valued on average at \$217 per square foot, while walkable urban real estate is valued on average at \$541 per square foot—a 150 percent premium. The breakdown into the four land use options is shown on the following page.

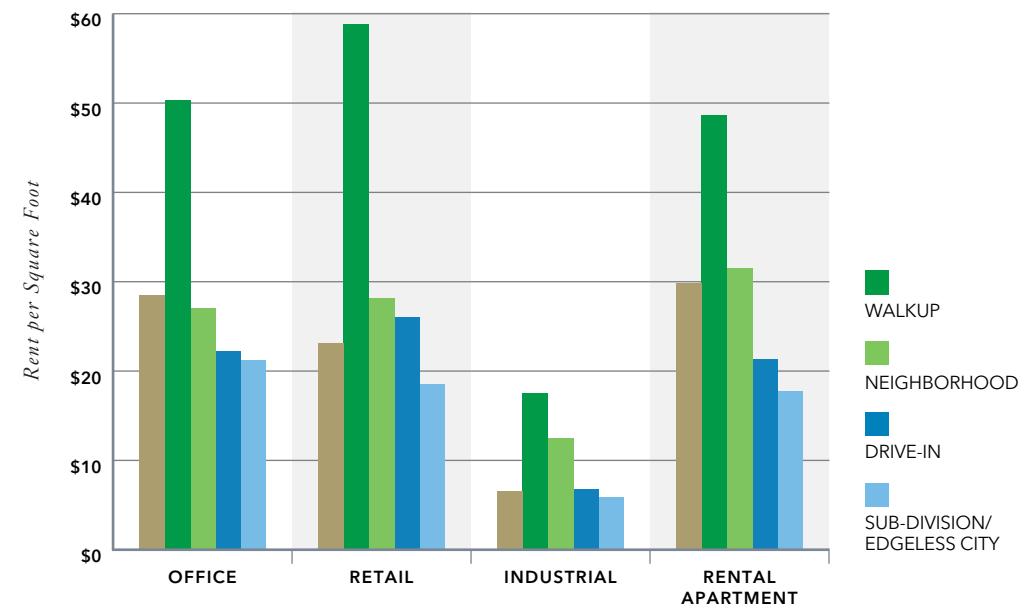
The rents of walkable urban product are also substantially higher than drivable sub-urban, as would be expected given the valuation premiums.

Overall, rent premiums for walkable urban real estate range from 2.1 to 2.2 times that of drivable sub-urban real estate. It is worth noting that much of this is driven by high demand for New York City real estate products. However, when removing New York City walkable urbanism, the rest of the tri-state region still experiences rental premiums from 1.2 to 1.5 times that of drivable sub-urban. This is a strong indication that walkable urbanism is an in-demand product throughout the tri-state region.

Average Real Estate Value by Product Type
(Value per Square Foot)



Average Rents by Product Type
(Cost per Square Foot)



OFFICE

- **WalkUPs hold 84 percent of the tri-state region’s office value.** This is striking, and indicative of the prominence of New York City’s role in high-value commercial real estate. All other land-use options, from Walkable Neighborhoods to Drivable Sub-divisions, contain a combined 16 percent of the office real estate market value. This product type has the highest concentration in WalkUPs and has a market value of \$722 per square foot.
- **WalkUP office rents average \$50.29 per square foot, which is a 126 percent premium over that of Drive-Ins (\$22.21 per square foot).** Walkable Neighborhood office space, at \$27.06 per square foot, was still a 27 percent premium compared to Drivable Sub-divisions.

RETAIL

- **WalkUPs hold 48 percent of the regional retail real-estate market value.** However, retail is more dispersed among the four land use options, with 28 percent occurring in Drivable Sub-divisions. This means that 77 percent of retail value exists either in the highest form of walkability or in the strip mall-oriented retail in Drivable Sub-divisions. While Drive-Ins do contain many regional malls, they contain only 11 percent of regional retail market value, behind Walkable Neighborhoods at 13 percent. Overall, retail has a market value of \$781 per square foot in WalkUPs.
- **WalkUP retail rents average \$58.85 per square foot, the highest rental price among office, retail, industrial, and rental apartments.** This is an indication of the high demand and tight supply for retail space, especially in premium retail corridors in Manhattan. This represents a premium of 126 percent compared to Drive-Ins. In the case of

Walkable Neighborhoods, retail space leases for \$28.19 per square foot, or a 52 percent premium compared to Drivable Sub-divisions.

INDUSTRIAL

- **WalkUPs do not contain significant quantities of industrial space, and so it follows that they only account for two percent of the regional market value for this product type.** Most of the region’s industrial real estate value is in Drivable Sub-divisions (58 percent), followed by Walkable Neighborhoods (38 percent). The Walkable Neighborhood industrial value is driven by specialty use, light-to-medium industrial spaces adjacent to WalkUPs—and due to their proximity to employees, they can command a premium. Finally, while Drive-Ins are regional job centers throughout the region, they contain just one percent of the region’s industrial real estate value. Industrial space in WalkUPs has a market value of \$229 per square foot.
- **While there is little relative industrial space in WalkUPs, the bit that there is commands a premium.** In fact, at \$17.57 per square foot, WalkUP industrial space commands a 159 percent premium over Drive-Ins at \$6.79 per square foot. To some extent, this is reflective of the scarce supply of industrial space in areas close to population centers. Industrial space in Walkable Neighborhoods is also more than double the per-square-foot price in Drivable Sub-Divisions (\$12.48 versus \$5.91, or an 111 percent premium). In comparing Walkable Neighborhood and Drivable Sub-Division product type rents, the premium for industrial space is the highest of all product types.

RENTAL APARTMENTS

- **Sixty percent of the region’s rental apartment value is in WalkUPs.** When combined with Walkable Neighborhoods, walkable urban areas contain 89 percent of the tri-state region’s market value of rental apartments. Much of this likely is driven by the heavy concentration of rental apartments in New York City and the core of the region. Nevertheless, it illustrates the power of walkable urbanism in driving the market value of this type of residential product. Drivable Sub-divisions contain only nine percent of the region’s rental apartment market value, and Drive-Ins barely one percent. Rental apartment buildings in WalkUPs have a market value of \$757 per square foot.
- **WalkUPs command a premium for rental apartment units: \$4.05 per square foot (monthly) in WalkUPs compared to \$1.78 in Drive-Ins, which is a 128 percent premium.** Walkable Neighborhoods were more affordable at \$2.62 per square foot (monthly), compared to \$1.48 per square foot in Drivable Sub-divisions, or a 77 percent premium.

FOR-SALE RESIDENTIAL

- **The real estate market value of for-sale housing in the tri-state region is a stark contrast to rental apartments.** Whereas 89 percent of rental apartment valuation is concentrated in walkable urban areas, 85 percent of for-sale housing market valuation is in drivable sub-urban areas. Drivable Sub-divisions, specifically, account for 83 percent of the tri-state region’s for-sale residential market value.
- **One percent of the tri-state region’s for-sale square footage is in WalkUPs; given this scarcity, and the increasing demand for WalkUPs, one may expect premium prices.** These units have market values of \$764 per square foot in WalkUPs, a 241 percent premium over units in Drive-Ins. The valuation per square foot drops quickly for other land use options, highlighting the uniqueness of WalkUPs and the demand to live in them. Walkable Neighborhood for-sale units have a market value of \$379 per square foot, or a 151 percent premium over Drivable Sub-divisions. For-sale residential units in Drive-ins and Drivable Sub-divisions are \$289 and \$217 per square foot, respectively.

Split of Product Types by Land Use

LAND USE OPTION	OFFICE	RETAIL	INDUSTRIAL	RENTAL APARTMENTS	FOR-SALE RESIDENTIAL
WalkUP	84%	48%	2%	60%	4%
Walkable Neighborhood	4%	13%	38%	29%	11%
Drive-In	5%	11%	1%	1%	2%
Drivable Sub-Division	7%	28%	58%	9%	83%
TOTAL	100%	100%	100%	100%	100%

Findings in Real Estate Trends

By examining leasing activity, one can begin to see the true trends towards walkable urbanism in the tri-state region.

Using net absorption⁴⁶ data from CoStar, we see that Drivable Sub-urban product was losing leasing activity from 2001 to 2009, and it only marginally gained net absorption in 2010 to 2016. During this real estate cycle, walkable urbanism has accounted for 90 percent of the net absorption in the region.

This research uses a measure known the Fair Share Index (FSI) as another way of identifying momentum. The FSI measures the marginal market share increase or decrease for net absorption of real estate for a given time period, compared to the market share at the beginning of the time period. For this calculation, we measure market share increase from 2010 through the third quarter of 2016 against the base period of first quarter of 2010. This marks the start of the current real estate cycle.

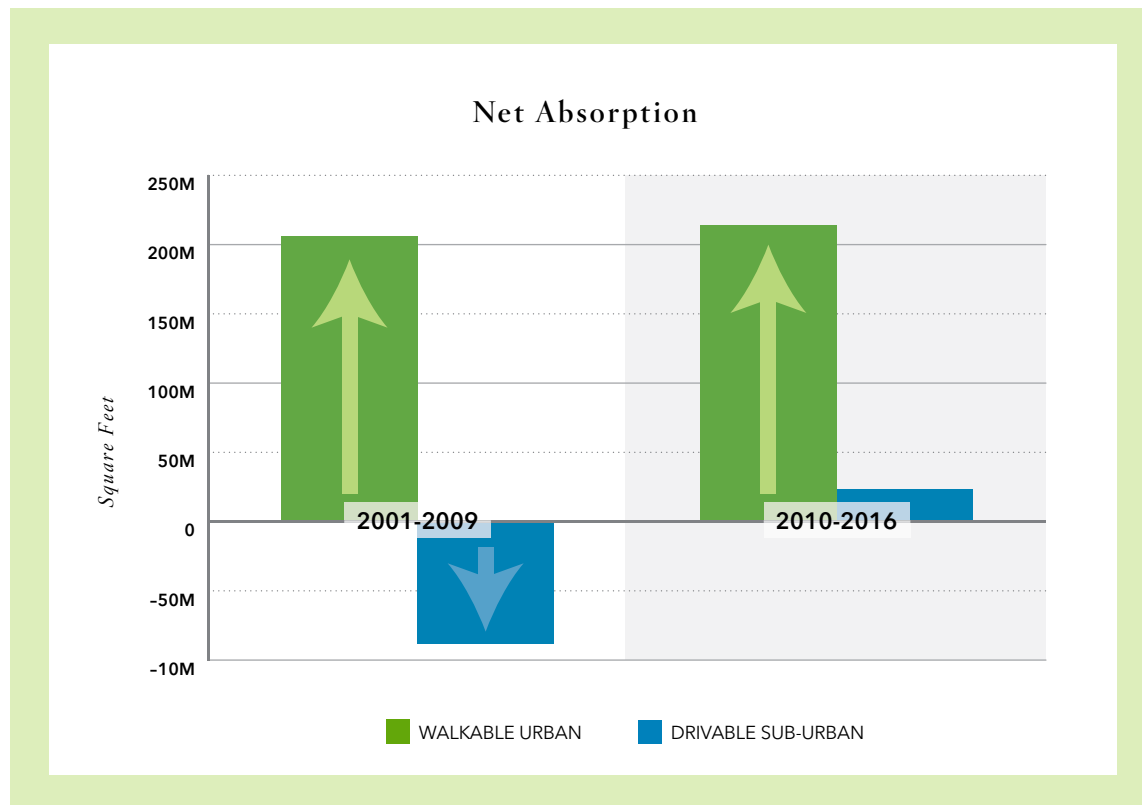
Because the FSI measures marginal change in market share against a base year, it shows which places are relatively growing and shrinking. An FSI over 1.0 indicates a place is gaining market share against its 2010 base; an FSI between 0 and 1.0 indicates positive absorption, but a loss of market share; a negative FSI indicates both a loss of market share and negative absorption. For the FSI analysis in this study, we used office, retail, industrial, and rental apartment product types. The total FSI is the inventory weighted average of the four product types.

This analysis yields a weighted total FSI of 1.9 for walkable urbanism in the tri-state region.⁴⁷ This number suggests that not only is walkable urbanism gaining market share in terms of new leasing activity, it is gaining it at a rate nearly two times relative to what we would expect, given inventory.

This contrasts significantly with the weighted FSI of 0.1 for Drivable Sub-urban areas. This means that, on the weighted average, these areas saw negligible absorption, and they lost market share compared to their 2010 base.⁴⁸

These findings are significant. First, they confirm our earlier research that suggested the tri-state region was

gaining market share in walkable urbanism.⁴⁹ Secondly, it is further evidence of a longer-term trend. This high FSI could mean the region is starting to reverse a trend towards drivable sub-urban sprawl. As the region continues to grow in its walkable urban locations, and expand its walkable urban inventory (especially outside of the region's core), more real estate activity will occur in thriving, walkable urban places.



WALKUP PERFORMANCE & RANKINGS

Economic Performance

WalkUPs drive the tri-state region's economy by generating most of its gross regional product (GRP) and serving as concentrations of the most valuable real estate.

OVERVIEW

Walkable urbanism offers tremendous economic advantages relative to drivable sub-urban. This form offers infrastructure advantages, access to jobs and labor, and proximity to other vendors and suppliers. What economists call "agglomeration economies"⁵⁰ occurs in concert with walkable urbanism, especially for knowledge-based economic sectors. This study shows that WalkUPs drive the tri-state region's economy, generate most of the region's gross regional product (GRP), and contain the most valuable real estate.

Our research in *Foot Traffic Ahead 2016*⁵¹ examined the largest 30 metro areas in the United States and suggested that regions with greater walkable urbanism also experienced greater economic performance in terms of GRP per capita. This report expands to examine economic performance at the place level in terms of GRP per job and market value per square foot of real estate. It is the first effort in the tri-state region to utilize place-based GRP.

States and local governments prioritize economic performance and economic growth. Public policies have included incentives for business relocations, infrastructure investments, and developing the local workforce. Increasingly, place management organizations are taking on economic development roles as well, especially by organizing local businesses to improve the "sense of place" through investment and marketing. This report can assist in those public policy considerations by showing where economic performance occurs at the place level.

WalkUP Economic Performance:

In the tri-state region, WalkUPs account for:

45.5%
of Gross Regional Product

38.4%
of Real Estate Market Value

Metrics Used to Determine Economic Performance

In examining economic performance, we looked at nationally available economic measures of GRP and real estate values.⁵²

GROSS REGIONAL PRODUCT: 50% of Economic Performance Ranking

- **GRP per Job**
A measure of employee productivity. To develop this measure, the research team relied on two data sets. The first was total employment by NAICS code, available by the U.S. Census Longitudinal Employer-Household Dynamics data set, particularly the LODES data at place of work. Secondly, this analysis used value added per employee data, at the county and NAICS code level, available from IMPLAN.

REAL ESTATE VALUE: 50% of Economic Performance Ranking

- **Real Estate Value per Square Foot**
An estimate of the market value of all the real estate product types in the tri-state region. This measure uses inventory, rental rates, and vacancy data from CoStar™; capitalization rates from CoStar and Cushman and Wakefield; and operating ratios from Cushman and Wakefield. For-sale valuations were provided by Redfin.

ECONOMIC PERFORMANCE INDEX (EPI)

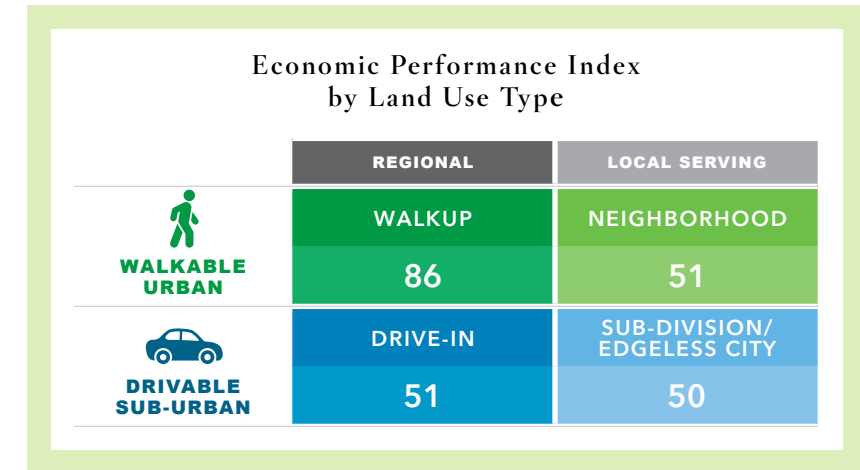
This study uses a data-driven approach to measure the economic performance of WalkUPs. To do so, we developed an Economic Performance Index (EPI) to create Economic Performance Rankings that characterize the relative economic contribution of a WalkUP to the region. The EPI is based on two measures: GRP per job (50 percent) and real estate value per square foot (50 percent).

A WalkUP ranks high on GRP per job, or employee productivity, when it consists of employment with a higher concentration of high-output employees. These are the more productive industries, especially in the knowledge economy, that tend to generate the highest economic value added to the region. The findings on GRP are that economic activity in WalkUPs constitutes 45.3 percent of the region's GRP. This figure increases to 55.6 percent when including Walkable Neighborhoods.

WalkUPs rank highly on real estate value per square foot when there is increasing demand for real estate in that area. This is reflective of the desirability of the WalkUP as a place to establish businesses and for residents of the region to "live, work, and play." The 149 WalkUPs contain 38.4 percent of the tri-state region's real estate market value, a figure that grows to 53.4 percent when adding Walkable Neighborhoods.

EPI & LAND USE

We find that on the aggregate, WalkUPs have a much higher EPI than any other land use option.



The other three land use options, in fact, tend to be close to one another on the aggregate. It is in WalkUPs where the strongest economic performance is found, as they collectively have an Economic Performance Ranking that is 73 percent higher than Drivable Sub-divisions.

The rankings of the 149 WalkUPs are in the tables that begin on page 39. The highest-ranked of the 149 WalkUPs tend to cluster around the urban core and especially in New York City. In fact, the top 17 WalkUPs are all located in Manhattan, which is not surprising given its significance as a global financial and cultural capital. However, the top quartile of WalkUPs included seven WalkUPs outside of New York City:

- **Greenwich, Conn.**
- **Princeton, N.J.**
- **Downtown Jersey City, N.J.**
- **Great Neck, N.Y.**
- **South Stamford, Conn.**
- **Bronxville, N.Y.**
- **Larchmont, N.Y.**

This highlights the fact that the tri-state region has been disproportionately growing its economy within

its walkable urban core. Based on U.S. Census LEHD data, over the decade from 2004 to 2014, New York City grew its employment by 28 percent, compared to 3.8 percent in the rest of the region. By this measure, New York

City alone accounted for 83 percent of the tri-state region's job growth over the decade.⁵³ Thus, it is not a surprise to see such trends reflected in the GRP per job and in real estate value per square foot measures in places like Manhattan and Brooklyn.

Secondly, this analysis finds that Town Centers tended to rank lower than Downtowns, Downtown Adjacent, and Urban Commercial WalkUPs. Although they are the most common type of WalkUP, Town Centers do not experience the same levels of employee productivity, or the real-estate valuations per square foot, seen in Downtowns.

However, one should not lose sight of the future significance of these Town Centers. Part of the reason Downtown, Downtown Adjacent, and Urban Commercial WalkUPs perform so highly in the tri-state region is because the region's economy is heavily concentrated in Manhattan and the region's core. In other words, there has been an insufficient balance of job growth elsewhere in the region. The Town Center WalkUPs already have the walkable infrastructure and inventory to constitute a WalkUP, but they have been underdeveloped in the tri-state region. There is opportunity to create more walkable balance in the region, and in doing so increase the economic performance of WalkUPs.

GRP, MARKET VALUATION & WALK SCORE

Walkable urbanism increases economic performance. One way to measure this is Walk Score, a major component in determining walkable urbanism versus drivable sub-urban areas per our methodology. First, we compare Walk Score to the component measures of GRP per job and valuation per square foot. A simple regression analysis⁵⁴ indicates positive correlations, or elasticities,⁵⁵ which measure relative percent changes.⁵⁶

The trend tells us that for WalkUPs, a one percent increase in Walk Score is associated with a 0.61 percent increase in GRP per job—positive, but somewhat inelastic. This relationship is marginally negatively inelastic for Drive-Ins: a one percent increase in Walk Score yields a -0.20 percent change in GRP per job.

This relationship is more striking in terms of value per square foot. In WalkUPs, a one percent increase in Walk Score is associated with a 3.7 percent increase in value per square foot. This suggests a very elastic relationship and a strong return to walkability in terms of valuation. For Drive-Ins, this relationship was small (0.11 percent in market value for every one percent change in Walk Score), but statistically insignificant.

	LAND USE OPTION	
	WALKUP	DRIVE-IN
Elasticity of Walk Score on GRP / Job	0.612***	-0.193***
R-Squared	0.0595	
Elasticity of Walk Score on Market Value / s.f.	3.713***	0.113
R-Squared	0.1938	

p-value statistically significant at *0.10 **0.05 ***0.01

It is important to note that Walk Score has a different marginal effect at varying levels. When considering GRP per job for a place with a Walk Score of 70, one additional point of Walk Score is associated with an increase in \$692 in GRP per job; at a high Walk Score of 95, an additional point of Walk Score is associated with an increase of \$615 per job. These effects are cumulative, and they are impressive when moving from a Walk Score of 70 (the low end of “Very Walkable”) to a Walk Score of 95 (a “Walker’s Paradise”). A move from a Walk Score of 70 to 95 is associated with nearly a \$16,500 increase in GRP per job.

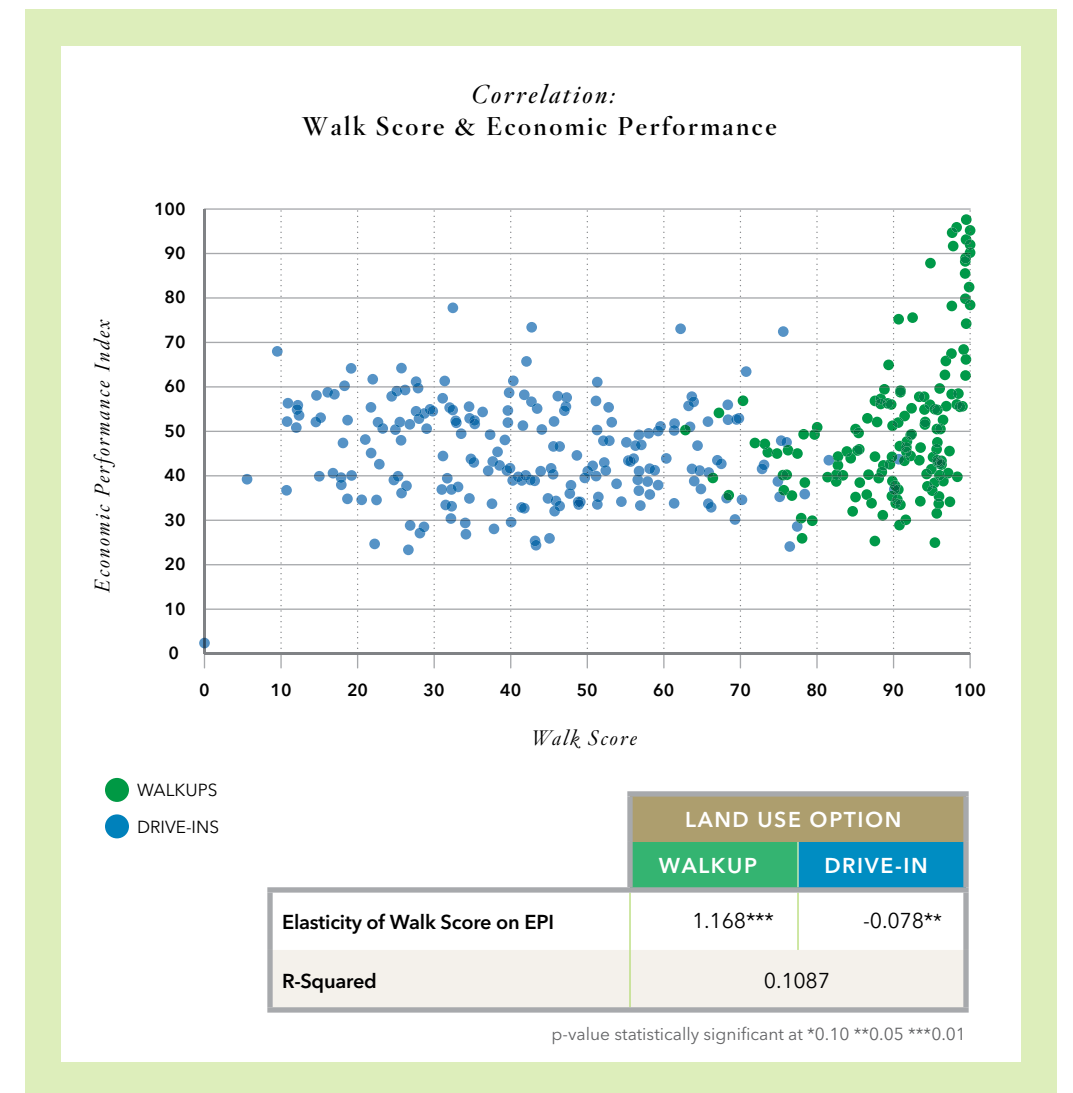
The same dynamic exists with market valuation per square foot. At a Walk Score of 70, a one-point increase is associated with about a \$6 per square foot increase in market valuation. This increases at higher Walk Scores, suggesting increasing returns to walkable urbanism. At a high Walk Score of 95, a one point increase in Walk Score is associated with an \$11 per square foot increase in market value. Cumulatively, a move from a Walk Score of 70 to a Walk Score of 95 is associated with a total increase of \$179 per square foot.

WALK SCORE	At a given WALK SCORE, a 1-Point increase in Walk Score is associated with an increase in...		At a given WALK SCORE, the cumulative effects of increasing from a Walk Score of 70 is...	
	GROSS REGIONAL PRODUCT (GRP) PER JOB (\$)	REAL ESTATE MARKET VALUATION (\$ per Square Foot)	GROSS REGIONAL PRODUCT (GRP) PER JOB (\$)	REAL ESTATE MARKET VALUATION (\$ per Square Foot)
70	\$692	\$4.89	n/a	n/a
75	\$674	\$5.90	\$3,461	\$24.46
80	\$657	\$7.03	\$6,831	\$53.96
85	\$642	\$8.28	\$10,117	\$89.10
90	\$628	\$9.67	\$13,327	\$130.52
95	\$615	\$11.20	\$16,467	\$178.89

EPI & WALK SCORE

When comparing our EPI against Walk Score, we see a generally positive correlation. Furthermore, this relationship appears exponential. It is at a Walk Score of approximately 80, and especially 90 and above, where the EPI takes off. The highest performers in the EPI cluster at a very high Walk Score, especially those above 95. This suggests that walkable urbanism may have an influence on our EPI measures, and that this is especially pronounced at higher Walk Scores above 90.

The relationship between Walk Score and EPI is positive and elastic for WalkUPs: for every one percent Walk Score increase we find a 1.17 percent increase in EPI. This relationship is marginally negative, and basically flat for Drive-Ins: a one percent increase in Walk Score slightly lowers EPI by 0.08 percent.

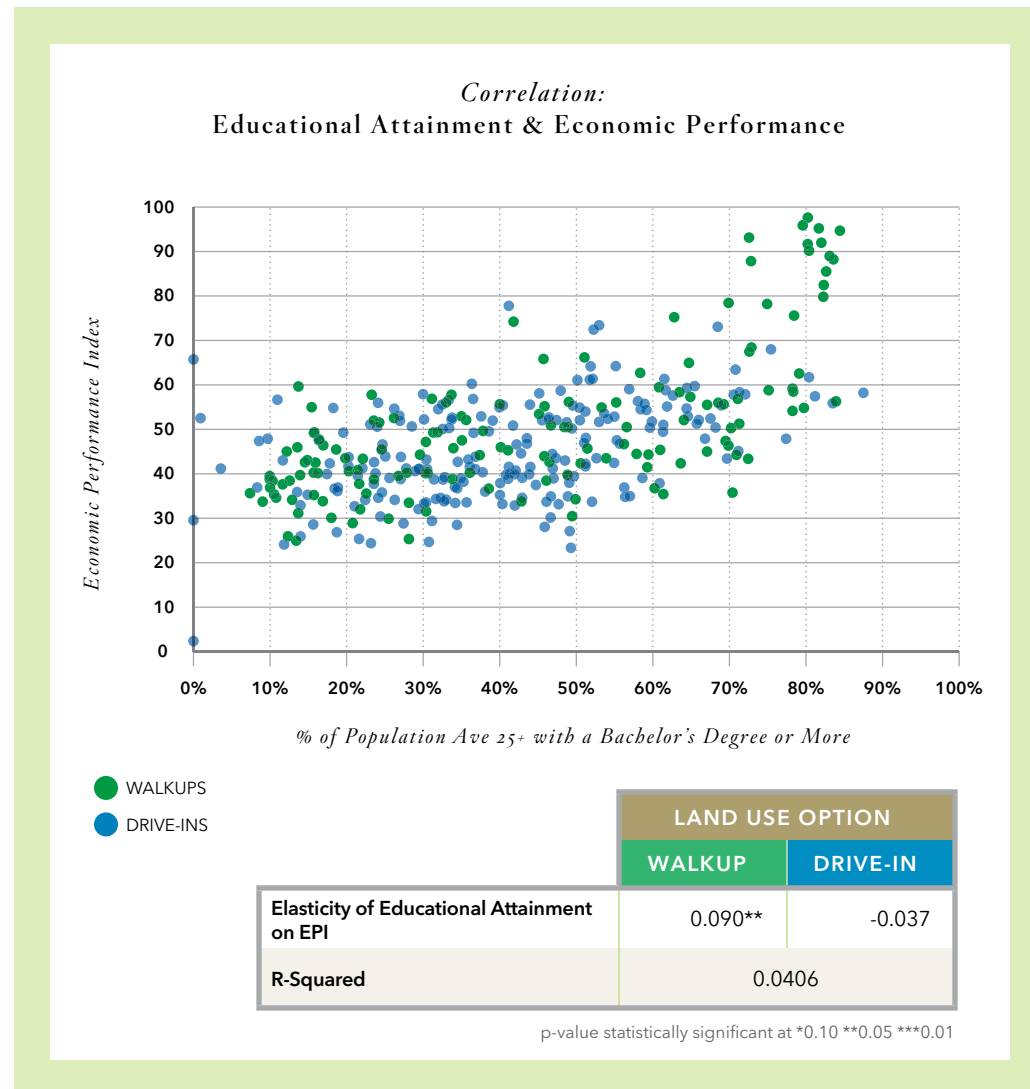


EPI & EDUCATIONAL ATTAINMENT

A widely-explored theory in urban economics is the relationship between educational attainment and economic output. The Milken institute, in its paper entitled *A Matter of Degrees* found that adding one year to the average year of schooling is associated with an increase in real GDP per capita of 10.5 percent and an increase in real wages per worker of 8.4 percent.⁵⁷ As Edward Glaeser, a professor of economics at Harvard University said, "The most successful economic development policy is to attract and retain smart people and then get out of their way."⁵⁸

We see a positive correlation between the percent of population with a bachelor's degree or above and EPI. Also, there are several WalkUPs at the high end of the distribution with outstanding levels of educational attainment; not surprisingly, they tend to be areas in Manhattan, such as Madison Avenue, Tribeca, Union Square, and East Midtown. The shape of the correlation also appears to be geometric. One can see an inflection when the educational attainment level begins to exceed 60 percent with bachelor's degrees or more.

For WalkUPs, the overall relationship is slightly positive, but rather small: a one percent increase in the percent with bachelor's degrees or more associates with a 0.09 percent increase in EPI. This was negative (-0.04) for Drive-Ins, but statistically insignificant.

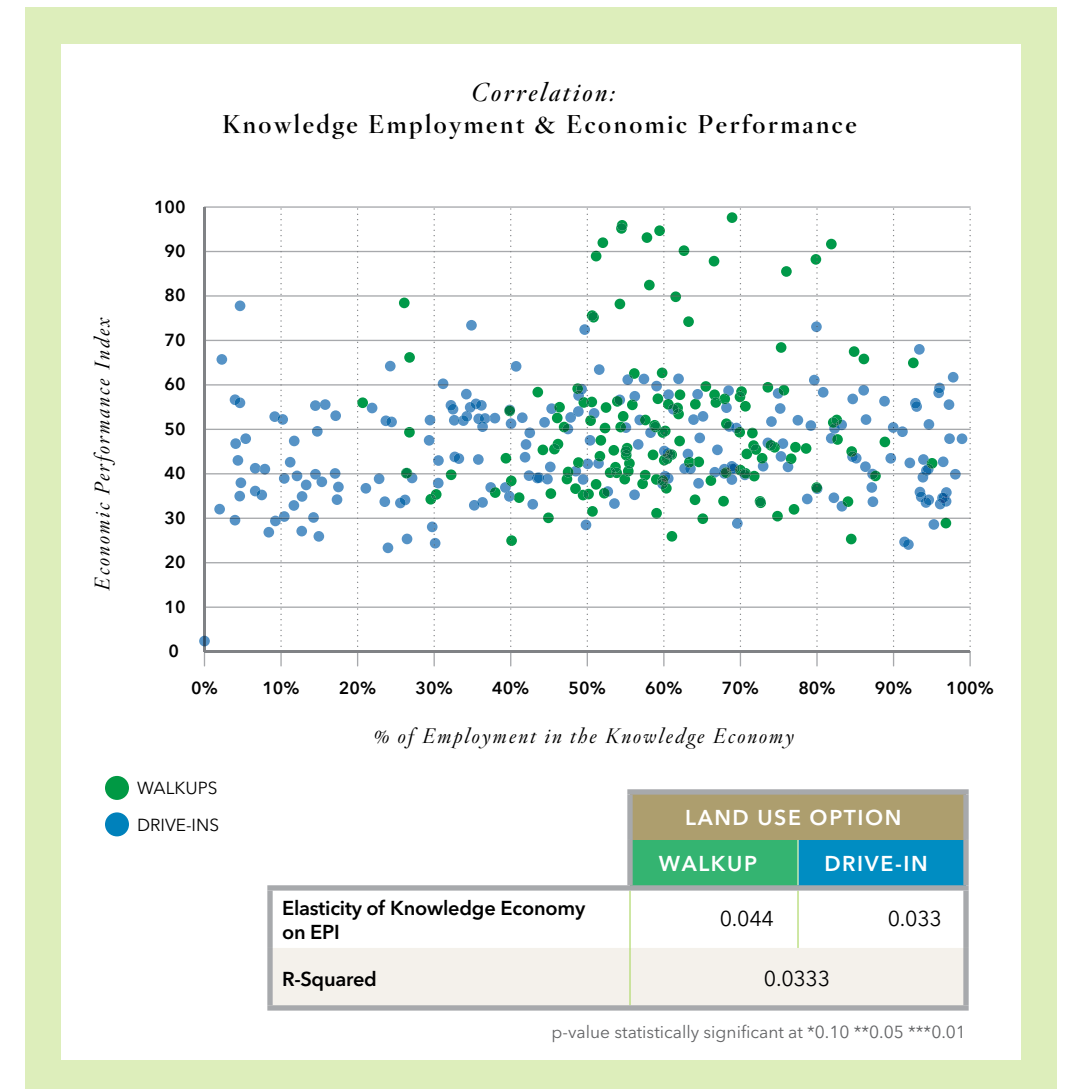


EPI & KNOWLEDGE ECONOMY

Similar to the relationship between educational attainment and economic outcomes, a parallel theory advanced by scholars such as Richard Florida is based on the value of the Creative Class and the knowledge economy.⁵⁹ These are employees and industry sectors that utilize creativity as opposed to manual labor. For this analysis, we utilized two-digit NAICS codes to develop a knowledge economy category that excludes certain industries, such as manufacturing.⁶⁰

The relationship between the EPI and the percent of employment in the knowledge economy is marginally positive for WalkUPs and Drive-Ins, but statistically significant. This is likely for several reasons. First, using two-digit NAICS codes does not fully capture all knowledge employees, since, for example, designers working for an apparel manufacturer would be excluded. Secondly, half of the EPI is the real estate value per square foot, which is can be heavy in retail space in some WalkUPs. A retail-oriented corridor could, in fact, be very high in EPI due to demand for retail space; however, it would have a lower percent of knowledge workers since we exclude the retail industry from this category.

Nonetheless, there are still certain trends worth examining. First, the highest performers on the EPI tended to have a majority of their employment in the knowledge economy. The highest performer, East Midtown, has about 69 percent of its employment in the knowledge economy.





SUMMARY

Our research set out to measure economic performance at the place level and to identify trends in walkable urbanism with important economic and real estate indicators. This research indicates that walkable urbanism is tightly linked with economic performance: Walkable urbanism contains 55.6 percent of the region's GRP and 53.4 percent of its market value. One trend we find is that walkability, as measured by Walk Score, is positively associated with both GRP per job and real estate market valuation per square foot.

When ranking the WalkUPs, we find a heavy concentration of economic performance in Manhattan, other parts of New York City, and the core of the region. This highlights the strong returns on walkability that have occurred in these locations; it also suggests that the return on walkability investments and policies throughout the entire tri-state region could be substantial. These findings indicate that by fostering and developing more walkable urbanism in places outside of the region's core, those communities would experience increased economic performance. Increased walkable urbanism throughout the tri-state region would spread the benefits of walkable urbanism and is a key component of growing the regional economy.



Economic Ranking

OF TRI-STATE AREA WALKUPS:

RANK	WALKUP NAME	COUNTY/BOROUGH	STATE	WALKUP TYPE	EPI
1	East Midtown	Manhattan	NY	Downtown	98
2	Meatpacking District	Manhattan	NY	Urban Commercial	96
3	SoHo	Manhattan	NY	Urban Commercial	95
4	Madison Ave.	Manhattan	NY	Downtown Adjacent	95
5	Midtown	Manhattan	NY	Downtown	93
6	Union Square	Manhattan	NY	Urban Commercial	92
7	Lower Manhattan	Manhattan	NY	Downtown	92
8	Flatiron / 23rd St.	Manhattan	NY	Urban Commercial	90
9	West Village	Manhattan	NY	Urban Commercial	89
10	Tribeca	Manhattan	NY	Downtown Adjacent	88
11	Hudson Yards / Hell's Kitchen	Manhattan	NY	Downtown Adjacent	88
12	Hudson Square	Manhattan	NY	Urban Commercial	86
13	Greenwich Village / NYU	Manhattan	NY	Urban Commercial	82
14	Lexington Avenue Corridor	Manhattan	NY	Downtown Adjacent	80
15	Nolita	Manhattan	NY	Urban Commercial	78
16	Chelsea	Manhattan	NY	Urban Commercial	78
17	Upper West Side	Manhattan	NY	Downtown Adjacent	76
18	Downtown Greenwich	Fairfield	CT	Town Center	75
19	Chinatown	Manhattan	NY	Urban Commercial	74
20	Downtown Brooklyn	Brooklyn	NY	Downtown	68
21	Kips Bay Bellevue	Manhattan	NY	Urban Commercial	67
22	Lower East Side	Manhattan	NY	Downtown Adjacent	66
23	Civic Center	Manhattan	NY	Downtown Adjacent	66
24	Morningside Heights	Manhattan	NY	Urban University	65
25	Manhattan Valley	Manhattan	NY	Urban Commercial	63
26	Second Avenue Corridor	Manhattan	NY	Urban Commercial	63
146	Melrose Concourse	Bronx	NY	Urban Commercial	60
27	Princeton	Mercer	NJ	Urban University	59
28	DUMBO	Brooklyn	NY	Downtown Adjacent	59
29	Downtown Jersey City	Hudson	NJ	Downtown	59
30	Brooklyn Heights	Brooklyn	NY	Downtown Adjacent	58
31	Williamsburg	Brooklyn	NY	Urban Commercial	58
33	Inwood	Manhattan	NY	Urban Commercial	58
32	Greater Flushing	Queens	NY	Urban Commercial	58

KEY:

Levels of Economic Performance

- 1st QUARTILE: HIGHEST ECONOMIC PERFORMANCE
- 2nd QUARTILE: UPPER-MIDDLE ECONOMIC PERFORMANCE
- 3rd QUARTILE: LOWER-MIDDLE ECONOMIC PERFORMANCE
- 4th QUARTILE: LOWEST ECONOMIC PERFORMANCE

RANK	WALKUP NAME	COUNTY/BOROUGH	STATE	WALKUP TYPE	EPI
34	Great Neck	Nassau	NY	Town Center	57
35	South Stamford	Fairfield	CT	Downtown Adjacent	57
36	Bronxville	Westchester	NY	Town Center	57
37	Larchmont	Westchester	NY	Town Center	56
38	Bayside	Queens	NY	Urban Commercial	56
39	Hudson / Washington Heights	Manhattan	NY	Urban Commercial	56
40	Downtown Stamford	Fairfield	CT	Downtown	56
41	Long Island City	Queens	NY	Urban Commercial	56
42	Central Harlem	Manhattan	NY	Urban Commercial	56
43	Carroll Gardens / Cobble Hill	Brooklyn	NY	Urban Commercial	56
44	East Village	Manhattan	NY	Urban Commercial	56
45	Downtown White Plains	Westchester	NY	Downtown	55
46	Fordham-Belmont	Bronx	NY	Urban University	55
47	Forest Hills / Rego Park	Queens	NY	Urban Commercial	55
48	Hoboken	Hudson	NJ	Downtown Adjacent	55
49	Darien	Fairfield	CT	Town Center	54
50	Morristown	Morris	NJ	Town Center	53
51	Norwalk	Fairfield	CT	Town Center	53
52	Jackson Heights	Queens	NY	Urban Commercial	53
53	East Harlem	Manhattan	NY	Urban Commercial	52
54	Port Washington	Nassau	NY	Town Center	52
55	Jamaica	Queens	NY	Urban Commercial	52
56	Downtown Newark	Essex	NJ	Downtown	52
57	Downtown Summit	Union	NJ	Town Center	51
58	Downtown Long Beach	Nassau	NY	Town Center	51
59	Astoria	Queens	NY	Urban Commercial	51
60	Journal Square	Hudson	NJ	Downtown Adjacent	51
61	Hewlett	Nassau	NY	Town Center	51
62	Downtown Scarsdale	Westchester	NY	Town Center	50
63	Downtown Tarrytown	Westchester	NY	Town Center	50
64	Port Chester	Westchester	NY	Town Center	49
65	Ossining	Westchester	NY	Town Center	49
66	Downtown Norwalk	Fairfield	CT	Town Center	49
67	Downtown Yonkers	Westchester	NY	Town Center	49

RANK	WALKUP NAME	COUNTY/ BOROUGH	STATE	WALKUP TYPE	EPI
68	Trenton	Mercer	NJ	Downtown	48
69	Sunnyside / Woodside	Queens	NY	Urban Commercial	48
70	Downtown Garden City	Nassau	NY	Town Center	47
71	Downtown Bridgeport	Fairfield	CT	Town Center	47
72	Westfield	Union	NJ	Urban Commercial	47
73	Downtown Mount Vernon	Westchester	NY	Town Center	46
74	Downtown New Haven	New Haven	CT	Town Center	46
75	Kings Highway	Brooklyn	NY	Urban Commercial	46
76	Hempstead	Nassau	NY	Town Center	46
77	Downtown Valley Stream	Nassau	NY	Town Center	46
78	Nyack	Rockland	NY	Town Center	46
79	East Williamsburg	Brooklyn	NY	Urban Commercial	46
80	Downtown Linden	Union	NJ	Town Center	45
81	Huntington	Suffolk	NY	Town Center	45
82	Glen Cove	Nassau	NY	Town Center	45
84	Downtown Meriden	New Haven	CT	Town Center	45
83	Springfield Township	Union	NJ	Town Center	45
85	Fort Lee	Bergen	NJ	Town Center	44
86	Cedarhurst	Nassau	NY	Town Center	44
87	New Rochelle	Westchester	NY	Town Center	44
88	Downtown Ridgewood	Bergen	NJ	Town Center	44
89	Kingsbridge	Manhattan	NY	Urban Commercial	44
90	Rockville Center	Nassau	NY	Town Center	44
91	Westchester Square	Bronx	NY	Urban Commercial	44
92	Fort Greene	Brooklyn	NY	Downtown Adjacent	43
93	New Brunswick	Middlesex	NJ	Town Center	43
94	Park Slope / Prospect Heights	Brooklyn	NY	Urban Commercial	43
95	West New York	Hudson	NJ	Town Center	43
96	Fulton St. Corridor	Brooklyn	NY	Urban Commercial	43
97	Peekskill	Westchester	NY	Town Center	43
98	Sunset Park	Brooklyn	NY	Urban Commercial	43
99	Yale University	New Haven	CT	Urban University	42
100	Cranford	Union	NJ	Town Center	42
101	Red Bank	Monmouth	NJ	Town Center	41
102	Downtown Kearny	Hudson	NJ	Town Center	41
103	Bushwick	Queens	NY	Urban Commercial	41
104	Brooklyn College & The Hub	Brooklyn	NY	Urban Commercial	40
106	New Dorp	Staten Island	NY	Urban Commercial	40
105	Spring Valley	Rockland	NY	Town Center	40
107	Downtown Beacon	Dutchess	NY	Town Center	40
108	Wallingford	New Haven	CT	Town Center	40

RANK	WALKUP NAME	COUNTY/ BOROUGH	STATE	WALKUP TYPE	EPI
109	North Ironbound	Essex	NJ	Downtown Adjacent	40
110	St. George	Staten Island	NY	Urban Commercial	40
111	Williamsburg South	Brooklyn	NY	Urban Commercial	40
112	Dover	Morris	NJ	Town Center	40
113	Downtown Toms River	Ocean	NJ	Town Center	40
114	Newburgh	Orange	NY	Town Center	39
115	Englewood	Bergen	NJ	Town Center	39
116	Longwood	Bronx	NY	Urban Commercial	39
117	Bay Street Corridor	Staten Island	NY	Urban Commercial	39
118	Nutley	Essex	NJ	Town Center	38
119	North Plainfield	Union	NJ	Town Center	38
120	Elizabeth	Union	NJ	Town Center	38
121	Asbury Park	Monmouth	NJ	Town Center	38
122	Downtown Perth Amboy	Middlesex	NJ	Town Center	38
123	Downtown Waterbury	New Haven	CT	Town Center	37
124	South Orange	Essex	NJ	Town Center	37
125	Bay Ridge	Brooklyn	NY	Urban Commercial	37
126	Tenafly	Bergen	NJ	Town Center	36
127	Riverhead	Suffolk	NY	Town Center	36
128	Patchogue	Suffolk	NY	Town Center	36
129	Bloomfield Ave.	Essex	NJ	Town Center	35
130	Brownsville / Pitkin Ave.	Brooklyn	NY	Urban Commercial	35
131	Clifton	Passaic	NJ	Town Center	35
132	Downtown Passaic	Passaic	NJ	Town Center	35
133	Rutherford	Bergen	NJ	Town Center	34
134	Burnside-Tremont	Bronx	NY	Urban Commercial	34
135	Downtown East Orange	Essex	NJ	Town Center	34
136	Brighton Beach / Coney Island	Brooklyn	NY	Urban Commercial	34
137	Paterson	Passaic	NJ	Town Center	34
138	East Bronx	Bronx	NY	Urban Commercial	33
139	Far Rockaway	Nassau	NY	Urban Commercial	32
140	Flatbush	Brooklyn	NY	Urban Commercial	32
141	Downtown Middletown	Orange	NY	Town Center	31
142	Downtown Teaneck	Bergen	NJ	Town Center	30
143	South Union City	Hudson	NJ	Town Center	30
144	Downtown Poughkeepsie	Dutchess	NY	Town Center	30
145	Norwood	Bronx	NY	Urban Commercial	29
147	Kingston	Ulster	NY	Town Center	26
148	Downtown Union	Union	NJ	Town Center	25
149	North Union City	Hudson	NJ	Town Center	25

Social Equity Performance

In addition to driving the tri-state region's economy, WalkUPs are also surprisingly more socially equitable due to their combination of increased accessibility, affordability, and opportunity.

OVERVIEW

There is growing concern that economic performance in a metropolitan area comes at the cost of greater social equity, and that the increased price and valuation premiums for walkable urban real estate, outlined in the economic performance section of this report, is displacing low-income households. When looking at rising residential rents in WalkUPs, there can be little question that displacement of renters is taking place.

This research looks beyond just housing costs in determining social equity, adding household cost of transportation, accessibility of jobs, and other metrics as outlined in the methodology sidebar on the following page. It is important to note, however, that these measures do not capture all components of social equity. For example, they do not measure important qualities such as access to good schools, safe streets, or healthy environments.

Using a measurement of social equity that expands beyond just housing costs for low-income households, our research in *Foot Traffic Ahead 2016*,⁶¹ which examined the largest 30 metro areas in the U.S., suggested counter-intuitively that regions with greater walkable urban development also have greater social equity, despite their substantial price premiums. The reason for this unlikely outcome is that the higher cost of housing for a low-income household budget is offset by lower transportation costs, largely because of less reliance on expensive car transportation and increased accessibility of jobs. Walkable urban metros offer low-income households the option of commuting to more than two times as many jobs as a drivable sub-urban metro area. Surprisingly, the tri-state region was the

most socially equitable of the largest 30 metros, primarily due to its robust transit system, accessibility to two to three times as many jobs as drivable sub-urban metros, and large portion of public, subsidized, or rent-regulated housing in walkable areas. The task in this report is to explore this relationship at the WalkUP level in the tri-state region in more depth to develop place-based Social Equity Rankings.

Public policy increasingly accounts for social equity. States and communities in the tri-state region have used a range of housing policies, such as rent regulation; substantial investment in public and subsidized housing; transit, biking and walking infrastructure; and zoning considerations, subsidies, and incentives to address this concern. Additionally, community-based organizations and place management organizations have an increasing interest in improving economic opportunity for low-income households. This research shows many of these programs to be working, both moderating high housing costs in general and offsetting them with lower transportation costs and accessibility to opportunity.

SOCIAL EQUITY INDEX (SEI)

To have a data-driven assessment of social equity, we developed a Social Equity Index (SEI) and place-based Social Equity Rankings. We utilized a hypothetical low-income household, which we call the Reference Family, to determine the effect of living in the various walkable urban places and drivable sub-urban locations in the tri-state region.

This family consists of a working adult with two non-working dependents. The family rents housing and selects transportation modes commensurate

with the transportation options in a given place. This family's income is 50 percent of the area median income (AMI), which is generally around \$32,900 in the tri-state region.

The Social Equity Index is based on three components:

- **Accessibility:** 30 percent
- **Affordability:** 40 percent
- **Opportunity:** 30 percent

A walkable urban place or drivable sub-urban location ranks high on accessibility if residents can reach more employment destinations via multiple transportation modes. This research shows that WalkUPs and Walkable Neighborhoods have access to over 10 times as many jobs as those in Drive-Ins and Drivable Sub-divisions, as shown on page 43.

WalkUPs rank highly on affordability when the combination of housing and transportation costs for the Reference Family is relatively lower. The combined housing and transportation cost for the Reference Family in WalkUPs is 18 percent lower than Drivable Sub-divisions. This is primarily due to lower transportation costs for the Reference Family living in walkable urban places (35 percent lower), but surprisingly, walkable urban housing costs are lower by 10 percent than drivable locations, as shown on page 43. Our research in many metropolitan areas has never shown lower walkable urban housing costs than drivable locations for low-income households. The location of significant subsidized housing inventory within WalkUPs is a defining characteristic of the tri-state region and drives this result.

Metrics Used to Determine Social Equity⁶²

In examining social equity, we looked at nationally available measures of accessibility, affordability, and opportunity. The final eight measures (three in Accessibility, two in Affordability, and three in Opportunity) selected include the following:

Reference Family:

One working adult, and two dependents

50% Area Median Income

Makes approximately \$32,900 annually

Rents their home

ACCESSIBILITY

30% of Social Equity Ranking

- Jobs by Transit**

The number of jobs reachable by transit within 45 minutes for the Reference Household, a measure created by the EPA and available in the Smart Location Database. This measure considers actual travel times by transit during the PM peak hours, and includes walking, waiting, in-vehicle travel, and transfer times. Access by transit is an important measure of access to the WalkUP for residents of the region, especially WalkUPs in New York City and the core of the region, where driving can be prohibitively expensive and inconvenient.

- Workers by Transit**

How many working-age people can reach the WalkUP from elsewhere in the region within 45 minutes. Like jobs by transit—and using the same EPA Smart Location Database—this measure looks at transit in the other direction, and looks at the WalkUP as a job destination.

- Population by Transit**

How many people, in general, can reach the WalkUP from elsewhere in the region within 45 minutes. Also using the same EPA Smart Location Database, this measure looks at the WalkUP as a total destination for all people in the region, which would include other non-employment purposes like education, civic services, and entertainment.

AFFORDABILITY

40% of Social Equity Ranking

- Housing and Transportation Costs Burden**

Housing costs and transportation costs for the Reference Family. There is generally an inverse relationship between housing costs and transportation costs, as households attempt to achieve lower housing costs in a “drive until you qualify” manner. However, this comes at a tradeoff of higher transportation costs, especially in the tri-state region where the most robust transit network in the United States exists closer towards the core of the region. This metric looks at housing costs and transportation costs separately, in order to capture this tradeoff.

OPPORTUNITY

30% of Social Equity Ranking

- Housing Cost Ratio**

This metric attempts to capture the ability of the Reference Family to afford to move into the WalkUP. Whereas housing costs from the EPA Smart Location Database above capture absolute housing costs, those are reported costs are for existing residents, and they reflect potentially significant housing subsidies in the tri-state region. The Housing Cost Ratio, instead, is the 75th percentile rent in the WalkUP (as reported in the census) divided by the housing costs for the Reference Family. When this ratio is high, it suggests that the Reference Family is further from being able to afford a unit at the 75th percentile rent.

- Income Ratio**

A WalkUP can be unattainable for the Reference Family if there are larger numbers of wealthy people relative to low income people. This measure compares the percent of population making above \$200,000 annually divided by the percent making less than \$40,000 (like our Reference Family). When this ratio is high, it suggests low income families are more outnumbered, and it can be an indication of gentrification and an inability for low-income households to find attainable housing in the area.

- Land Use**

This report uses land use entropy, a measure developed by RPA that calculates the mix of uses in a location. High land use entropy measures suggests a more diverse set of activities within the WalkUP—the ability to “live, work, and play.” Lower land use entropy measures indicate the WalkUP does not offer as many uses for the Reference Family.

When considering affordability, it is not necessarily the case that WalkUPs closer to the core are more expensive for the Reference Family than in other areas. In fact, some of the most expensive WalkUPs in terms of housing costs are not in Manhattan, but in wealthy communities on Long Island and in New Jersey, Westchester, and Connecticut.

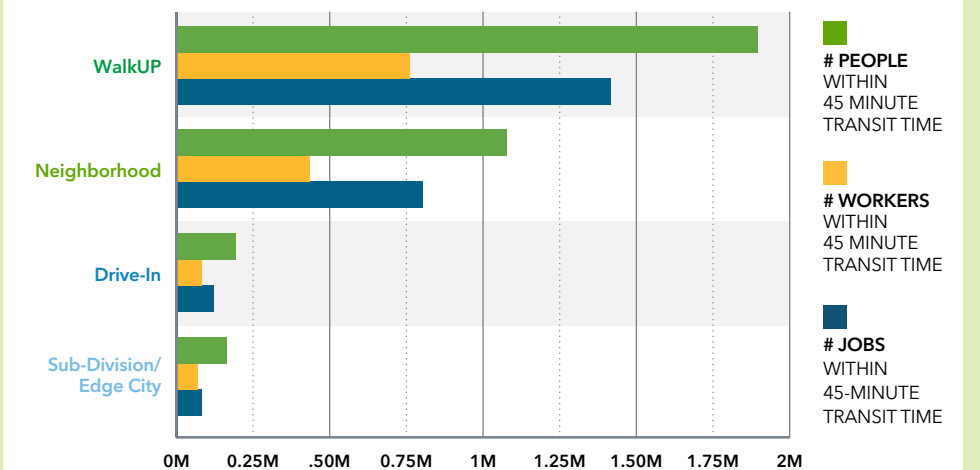
The impact of subsidized housing, particularly in New York City, is reflected in the Social Equity Index (SEI) and the Social Equity Rankings. This is likely due to the large amount of rent-regulated, public, and subsidized housing in the region, most notably in New York City. For example, the Lower East Side is likely the second-highest ranked of the 149 WalkUPs because of its amount of public and subsidized developments, which greatly lower the cost of housing for low-income households.

Even so, walkable urban housing costs are still far too high, with 52 percent of the Reference Family’s income going to housing (30 percent is the maximum a household should spend on housing). However, Reference Family housing costs in drivable sub-urban locations are even higher at 58 percent of household income.

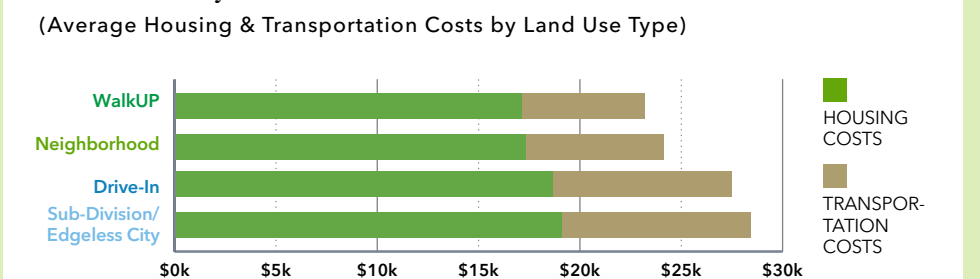
The fact is that low-income households are still spending too much on housing, so policy makers and stakeholders must make short- and long-term conscious actions to lower this cost. The specific reasons for the lower housing costs for low-income households in WalkUPs needs further study in order to expand and replicate policies in other areas.

The opportunity metrics measure several factors, two of which attempt to consider the true situation of the Reference Family with regard to the market conditions and demographics in an area. The intent of these measures is to identify whether the Reference Family could, in fact, live in a certain area, given market pressures.

Accessibility (Average Number per Land Use Type)



Affordability (Average Housing & Transportation Costs by Land Use Type)



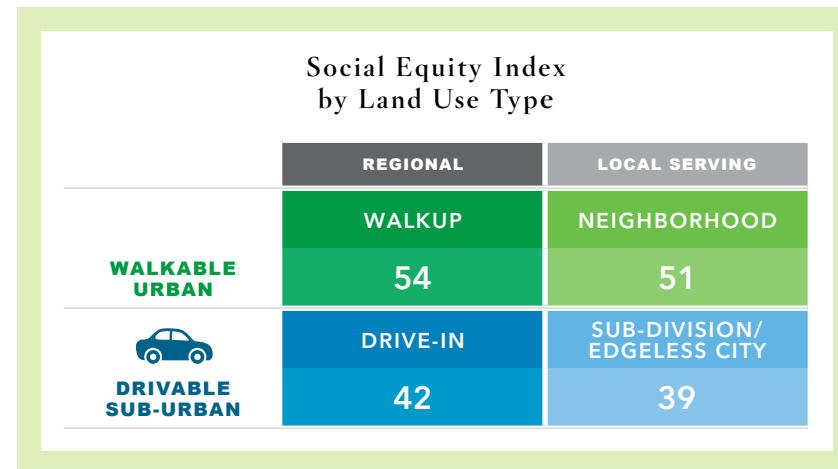
The first measure of opportunity, which we call Housing Cost Ratio, is the ratio of the market rent, which we approximate as the 75th percentile of contract rents, compared to the Reference Family's rent. By this measure, we see that the market rent in WalkUPs is 1.37 times that of the Reference Family's rents. However, Walkable Neighborhoods actually had a much closer ratio of 1.16 times the rent. Market rent in a Drive-In is 1.29 times what the Reference Family pays, and it is 1.20 times in Drivable Sub-Divisions.

The second measure also tries to capture this dynamic, but from a demographic angle that speaks to concerns over gentrification. What we call the Achievability metric is the ratio of an area's share of families making more than \$200,000 compared to families making less than \$40,000. The higher this ratio is, the more crowded out we would expect families like the Reference Family to be. We see that in WalkUPs, for every 100 households making under \$40,000, there are 30 making more than \$200,000. This ratio is lowest in Walkable Neighborhoods, with a ratio of 100-to-10. It is highest in Drivable Sub-Divisions, with a ratio of 100-to-51, suggesting many more wealthy residents for every low-income person.

Finally, the last measure of Land Use Mix shows that WalkUPs have a greater diversity of "live, work, play" opportunities, since they tend to cluster housing, office, retail, and civic functions. This contrasts with Drivable Sub-divisions, which are primarily single-use (single family housing).

SOCIAL EQUITY RANKINGS

We find that on the aggregate, WalkUPs have a higher Social Equity Index than any other land use option—in fact, 42 percent higher than Drivable Sub-division areas.



The rankings of the 149 WalkUPs are begin on page 50. The highest performing of the 149 WalkUPs by Social Equity Index tend to cluster around the core of the region, especially in New York City. Of the top quintile of 38 WalkUPs, only three are outside of New York City, and 22 of 38 are in Manhattan.

These findings are reflective of several factors. First, New York City is the core of the region in terms of rail transit, serviced by MTA, PATH, New Jersey Transit, Long Island Rail Road, and Metro North commuter rail. This high level of mass transit service is reflected in lower transportation costs for the Reference Family, as well as significantly more transit accessibility in comparison to WalkUPs further away in the region.

However, without access to rent-regulated, public, or subsidized housing, the Reference Family would be hard pressed to afford housing in the Lower East Side

WalkUP, for example, despite the offset provided by lower transportation costs and greater accessibility to jobs.

There are several WalkUPs throughout the region, particularly along commuter rail corridors, that appear to be more affordable but do not have many job opportunities via transit access within 45 minutes. Many WalkUPs outside of the core are not necessarily more affordable, as some of them are very wealthy communities such as Greenwich, Conn. or Summit, N.J.; being farther away does not always lower housing costs. Being closer to the core, however, does translate to significantly increased transit access, especially for WalkUPs within the New York City Subway network, PATH network, or Newark Light Rail. These systems also provide more frequent service than commuter rail, increasing access to jobs and amenities.

The way we have defined social equity results in, by necessity, an incomplete picture. Our index measures high social equity for places with low housing and transportation costs and good access to jobs and transit. But others define equity as being able to live in "high opportunity areas," defined by good schools, low crime, and a healthy environment, as well as access to jobs and affordability. Neither is inherently a better definition, but if we included these other factors the link between WalkUPs and social equity would likely be weaker.

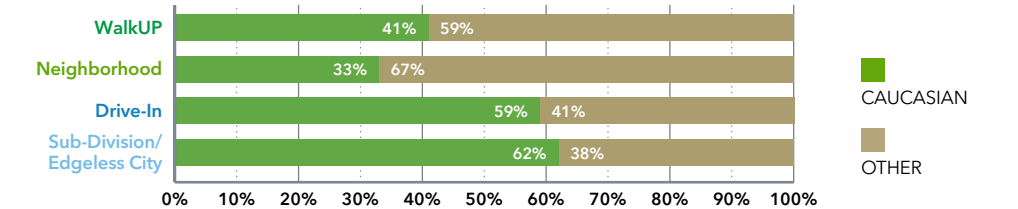
There is always room for debate and improvement. There are many different approaches to a place-based social equity metric; our methodology can, and should be, challenged and expanded.

ADDITIONAL SOCIAL EQUITY FINDINGS

As shown below, the tri-state region's walkable urbanism tends to be more diverse and integrated in terms of ethnic composition and income. The most diverse areas, in fact, are Walkable Neighborhoods, where 67 percent of the population consists of people of color; this is unsurprising given past public policies concentrating black and Hispanic communities in central urban areas. However, today these areas tend to not only be more diverse, but also more

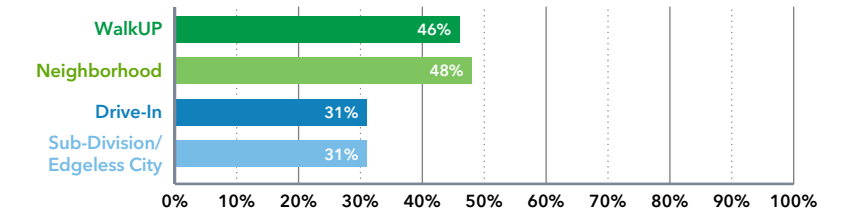
integrated. The proportion of people of color is much lower in Drivable Sub-divisions, at 38 percent. Furthermore, Walkable Neighborhoods have the highest proportion of people with annual incomes less than \$40,000 (close to the Reference Family's income), followed by WalkUPs at 46 percent. This number is 31 percent in the Drivable Sub-divisions. These statistics underscore that generally, we find trends of increased racial and economic diversity in walkable urbanism. These points are further illustrated later when comparing against our Social Equity Index.

Ethnic Diversity (% of Population)



Economic Diversity

(% of Population with Income < \$40k)



SOCIAL EQUITY INDEX & ECONOMIC PERFORMANCE INDEX

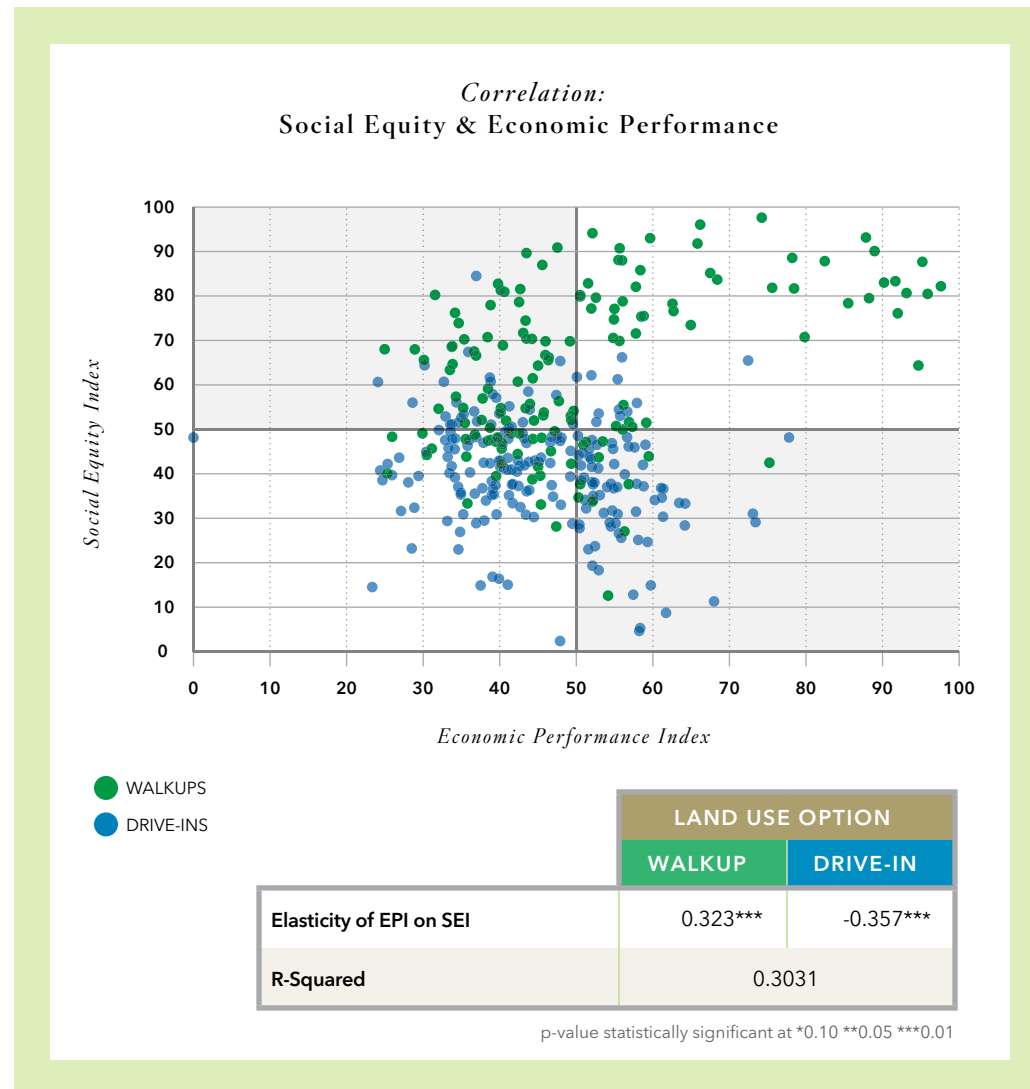
The previous section established the Economic Performance Index (EPI), which consists of GRP per job and real estate market valuation per square foot. Correlating with the Social Equity Index (SEI), we find that there is generally a positive correlation between the two. The higher the economic performance, the higher the social equity.

The upper right area (with SEI and EPI greater than 50) captures places that perform above average on both indices. They tend to be WalkUPs, especially those that are located in New York City and the core of the region. The economic powerhouses of the region, in other words, still rank favorably by these measures. They have world-class transit accessibility, lower transportation costs for the Reference Family, and offer more opportunity than drivable sub-urban areas in the tri-state region. The bottom left quadrant captures places below average on both measures. These areas tend to be Drive-Ins and are located throughout the region.

We fit a simple regression for EPI measures to identify the elasticity of EPI on SEI.⁶³ For WalkUPs, the trend is slightly positive, although it appears to plateau. In the Drive-Ins, a one percent increase in EPI is associated with a 0.32 percent increase in SEI. This is slightly inelastic, but positive and statistically significant.

A very interesting finding exists with Drive-Ins. These have a negative, and statistically significant, relationship. In the Drive-Ins, a one percent increase in EPI is associated with a 0.4 percent decrease in SEI. This means that Drive-Ins are unique, as places where increased economic performance suggests decreases in social equity. This is the first time our research has attempted to quantify our thesis that, due to a lack of walkable urbanism, Drive-Ins lose social equity as they increase economically.

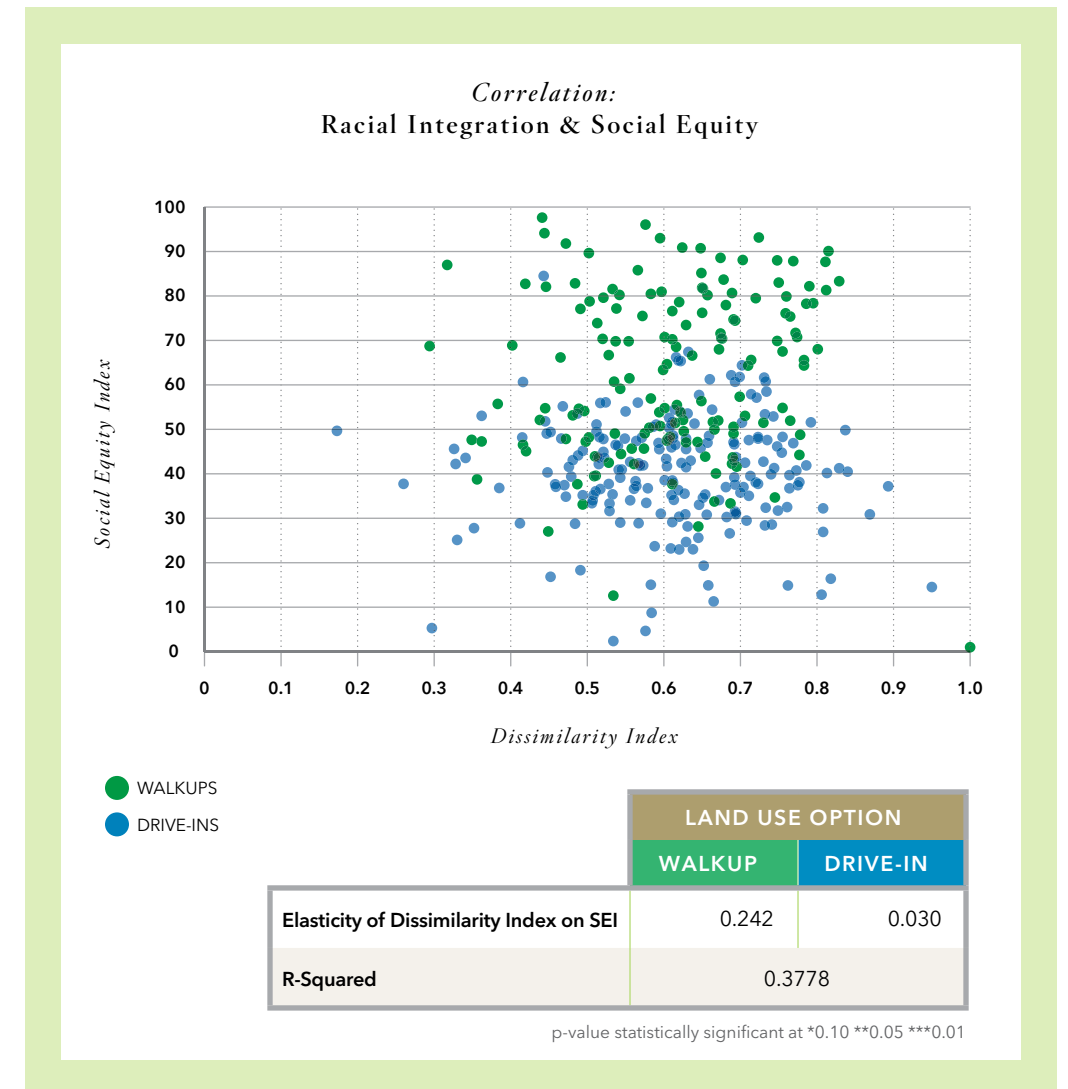
For WalkUPs this trend is not indicative of any tradeoff between economic performance and social equity. However, there is a tradeoff for the Drive-Ins, and the difference between the two trends is inextricably linked to the quality of walkable urbanism in the form of accessibility, affordability, and opportunity.



SEI & NEIGHBORHOOD INTEGRATION (DISSIMILARITY INDEX)

Neighborhood integration is a key outcome in social equity, and we wanted to explore the relationship between the SEI and the level of integration in WalkUPs. To do so, RPA calculated a Dissimilarity Index, and adjusted it to be a positive measure of racial integration in a geography.⁶⁴

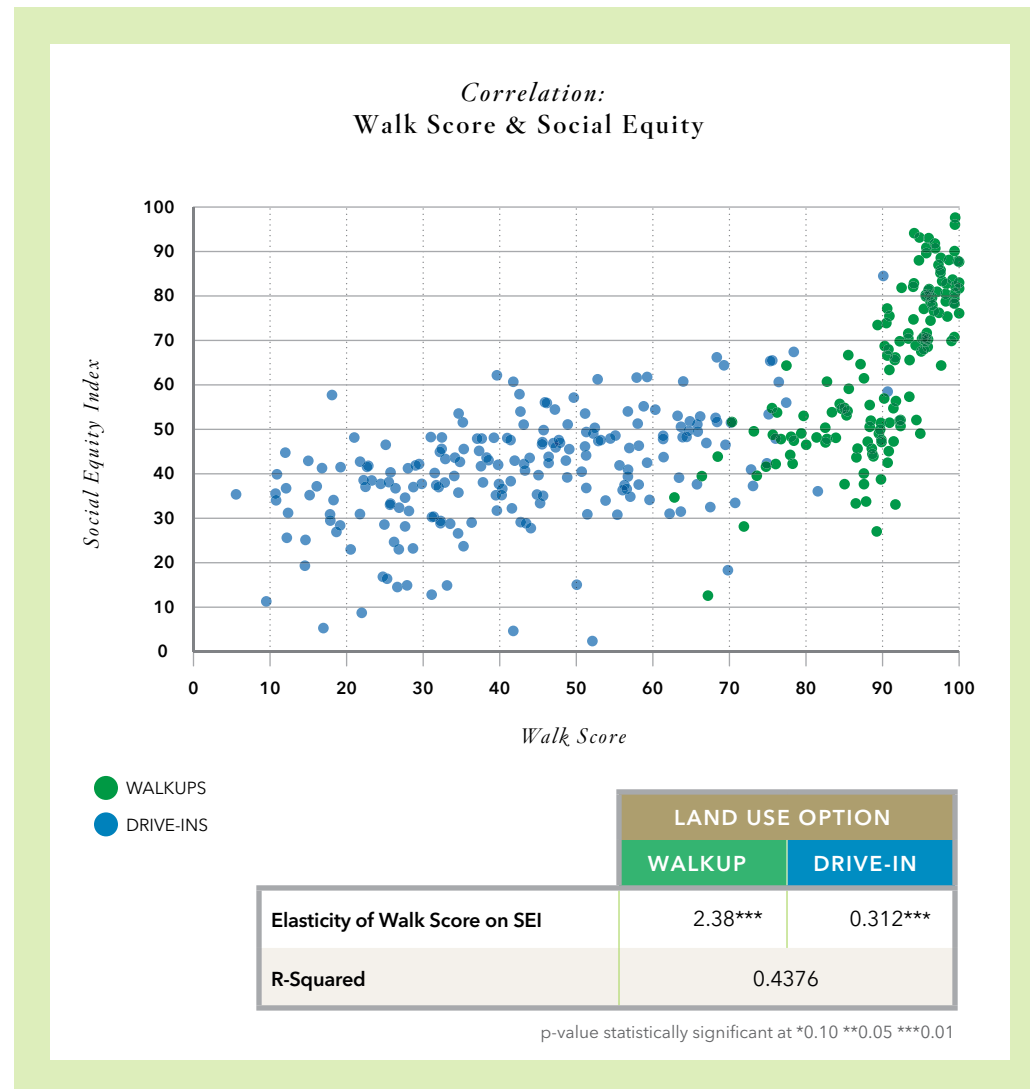
Generally, we found a weak (and statistically insignificant) positive elasticity on Dissimilarity Index and SEI for both WalkUPs and Drive-Ins. This suggests that the SEI is not statistically associated with either integration or segregation in a geography—it is only slightly positive. However, we can identify the SEI did not inadvertently reward areas with segregation; instead, it correlates positively with more integration, if even weakly (a one percent increase in Dissimilarity Index (more integration) associated with a 0.24 percent increase in SEI).



SEI & WALK SCORE

The SEI inherently rewards several measures that are also captured in the Walk Score measure, so it is intuitive that SEI and Walk Score would be correlated. Walk Score captures the level of amenities in each location, as well as transit access, two concepts incorporated into our SEI. Interestingly, it is at Walk Scores above 80 where we see a more geometric increase in the SEI.

The relationship between Walk Score and SEI is positive, and especially strong for WalkUPs. In WalkUPs, a one percent increase in Walk Score is associated with a 2.4 percent increase in SEI, suggesting a strongly elastic relationship. In other words, there are significant increasing returns to walkable urbanism in terms of SEI. Drive-Ins, however, had a much lower and somewhat inelastic effect. In the Drive-Ins, a one percent increase in Walk Score was associated with only a 0.31 percent increase in SEI.



SUMMARY

Our research set out to measure social equity at the place level and assess whether the economic performance of WalkUPs is at odds with goals of greater equity, inclusivity, and diversity. This research suggests that the two are reconcilable. Not only do WalkUPs perform better from an economic perspective, but their social equity and economic performance are positively correlated. Furthermore, this is a relationship unique to WalkUPs; Drive-Ins have a negative relationship between economic performance and social equity. It is walkable urbanism that gives a metro region its sense of place, drives the economy, and provides opportunities for its residents.

This research does not mean that concerns over affordability and gentrification are unfounded. There were few WalkUPs that had a specific combination of housing affordability and transportation affordability, especially when considering non-subsidized market rents. A robust set of public policy tools and market incentives—with a goal towards greater affordability and equity—continues to be necessary for residents of the tri-state region, to ensure they are able to access and afford the tremendous opportunities that WalkUPs provide.



Social Equity Ranking

OF TRI-STATE AREA WALKUPS:

RANK	WALKUP NAME	COUNTY/BOROUGH	STATE	WALKUP TYPE	SOCIAL EQUITY INDEX
1	Chinatown	Manhattan	NY	Urban Commercial	97.6
2	Lower East Side	Manhattan	NY	Downtown Adjacent	96.1
3	East Harlem	Manhattan	NY	Urban Commercial	94.1
4	Hudson Yards / Hell's Kitchen	Manhattan	NY	Downtown Adjacent	93.2
5	Melrose Concourse	Bronx	NY	Urban Commercial	93.0
6	Civic Center	Manhattan	NY	Downtown Adjacent	91.8
7	Sunnyside / Woodside	Queens	NY	Urban Commercial	90.9
8	Central Harlem	Manhattan	NY	Urban Commercial	90.7
9	West Village	Manhattan	NY	Urban Commercial	90.1
10	Fort Greene	Brooklyn	NY	Downtown Adjacent	89.6
11	Chelsea	Manhattan	NY	Urban Commercial	88.6
12	East Village	Manhattan	NY	Urban Commercial	88.1
13	Long Island City	Queens	NY	Urban Commercial	88.0
14	Greenwich Village / NYU	Manhattan	NY	Urban Commercial	87.8
15	SoHo	Manhattan	NY	Urban Commercial	87.7
16	East Williamsburg	Brooklyn	NY	Urban Commercial	87.0
17	Williamsburg	Brooklyn	NY	Urban Commercial	85.8
18	Kips Bay Bellevue	Manhattan	NY	Urban Commercial	85.2
19	Downtown Brooklyn	Brooklyn	NY	Downtown	83.7
20	Lower Manhattan	Manhattan	NY	Downtown	83.3
21	Flatiron / 23rd St.	Manhattan	NY	Urban Commercial	83.0
22	Downtown Newark	Essex	NJ	Downtown	82.8
23	Williamsburg South	Brooklyn	NY	Urban Commercial	82.7
24	East Midtown	Manhattan	NY	Downtown	82.2
25	Inwood	Manhattan	NY	Urban Commercial	82.1
26	Upper West Side	Manhattan	NY	Downtown Adjacent	81.8
27	Nolita	Manhattan	NY	Urban Commercial	81.7
28	Fulton St. Corridor	Brooklyn	NY	Urban Commercial	81.6
29	North Ironbound	Essex	NJ	Downtown Adjacent	81.3
30	Bushwick	Queens	NY	Urban Commercial	81.0
31	Midtown	Manhattan	NY	Downtown	80.7
32	Meatpacking District	Manhattan	NY	Urban Commercial	80.5
33	Flatbush	Brooklyn	NY	Urban Commercial	80.2
34	Journal Square	Hudson	NJ	Downtown Adjacent	80.2

KEY:
Levels of Economic Performance

■ 1st QUARTILE: HIGHEST SOCIAL EQUITY PERFORMANCE
■ 2nd QUARTILE: UPPER-MIDDLE SOCIAL EQUITY PERFORMANCE
■ 3rd QUARTILE: LOWER-MIDDLE SOCIAL EQUITY PERFORMANCE
■ 4th QUARTILE: LOWEST SOCIAL EQUITY PERFORMANCE

RANK	WALKUP NAME	COUNTY/BOROUGH	STATE	WALKUP TYPE	SOCIAL EQUITY INDEX
35	Astoria	Queens	NY	Urban Commercial	79.9
36	Jackson Heights	Queens	NY	Urban Commercial	79.6
37	Tribeca	Manhattan	NY	Downtown Adjacent	79.5
38	Hudson / Washington Heights	Manhattan	NY	Urban Commercial	78.8
39	Sunset Park	Brooklyn	NY	Urban Commercial	78.6
40	Hudson Square	Manhattan	NY	Urban Commercial	78.4
41	Second Avenue Corridor	Manhattan	NY	Urban Commercial	78.3
42	Longwood	Bronx	NY	Urban Commercial	78.0
43	Jamaica	Queens	NY	Urban Commercial	77.2
44	Fordham-Belmont	Bronx	NY	Urban University	77.1
45	Manhattan Valley	Manhattan	NY	Urban Commercial	76.6
46	Burnside-Tremont	Bronx	NY	Urban Commercial	76.2
47	Union Square	Manhattan	NY	Urban Commercial	76.1
48	Downtown Jersey City	Hudson	NJ	Downtown	75.5
49	Brooklyn Heights	Brooklyn	NY	Downtown Adjacent	75.4
50	Forest Hills / Rego Park	Queens	NY	Urban Commercial	74.7
51	Park Slope / Prospect Heights	Brooklyn	NY	Urban Commercial	74.5
52	Downtown Passaic	Passaic	NJ	Town Center	73.9
53	Morningside Heights	Manhattan	NY	Urban University	73.5
54	West New York	Hudson	NJ	Town Center	71.7
55	Greater Flushing	Queens	NY	Urban Commercial	71.6
56	Lexington Avenue Corridor	Manhattan	NY	Downtown Adjacent	70.8
57	Elizabeth	Union	NJ	Town Center	70.7
58	Hoboken	Hudson	NJ	Downtown Adjacent	70.6
59	Westchester Square	Bronx	NY	Urban Commercial	70.4
60	Kingsbridge	Manhattan	NY	Urban Commercial	70.4
61	Brownsville / Pitkin Ave.	Brooklyn	NY	Urban Commercial	70.3
62	Carroll Gardens / Cobble Hill	Brooklyn	NY	Urban Commercial	69.9
63	Downtown Yonkers	Westchester	NY	Town Center	69.8
64	Kings Highway	Brooklyn	NY	Urban Commercial	69.8
65	Brooklyn College & The Hub	Brooklyn	NY	Urban Commercial	68.9
66	Brighton Beach / Coney Island	Brooklyn	NY	Urban Commercial	68.7
67	Paterson	Passaic	NJ	Town Center	68.6
68	North Union City	Hudson	NJ	Town Center	68.0

RANK	WALKUP NAME	COUNTY/BOROUGH	STATE	WALKUP TYPE	SOCIAL EQUITY INDEX
69	Norwood	Bronx	NY	Urban Commercial	68.0
70	Bay Ridge	Brooklyn	NY	Urban Commercial	67.5
71	Hempstead	Nassau	NY	Town Center	66.7
72	Downtown Waterbury	New Haven	CT	Town Center	66.6
73	Downtown Mount Vernon	Westchester	NY	Town Center	66.2
74	South Union City	Hudson	NJ	Town Center	65.6
75	Downtown New Haven	New Haven	CT	Town Center	65.6
76	Downtown East Orange	Essex	NJ	Town Center	64.7
77	Madison Ave.	Manhattan	NY	Downtown Adjacent	64.4
78	Downtown Meriden	New Haven	CT	Town Center	64.3
79	East Bronx	Bronx	NY	Urban Commercial	63.4
80	New Rochelle	Westchester	NY	Town Center	61.5
81	Yale University	New Haven	CT	Urban University	60.7
82	North Plainfield	Union	NJ	Town Center	59.1
83	Rutherford	Bergen	NJ	Town Center	57.3
84	Asbury Park	Monmouth	NJ	Town Center	56.9
85	Trenton	Mercer	NJ	Downtown	56.4
86	Rockville Center	Nassau	NY	Town Center	55.7
87	Bayside	Queens	NY	Urban Commercial	55.5
88	Clifton	Passaic	NJ	Town Center	54.8
89	Wallingford	New Haven	CT	Town Center	54.8
90	New Brunswick	Middlesex	NJ	Town Center	54.8
91	Far Rockaway	Nassau	NY	Urban Commercial	54.6
92	Downtown Tarrytown	Westchester	NY	Town Center	54.1
93	St. George	Staten Island	NY	Urban Commercial	53.9
94	Downtown Valley Stream	Nassau	NY	Town Center	53.8
95	Nyack	Rockland	NY	Town Center	53.2
96	Downtown Norwalk	Fairfield	CT	Town Center	53.0
97	Port Chester	Westchester	NY	Town Center	52.1
98	Downtown Perth Amboy	Middlesex	NJ	Town Center	52.1
99	Fort Lee	Bergen	NJ	Town Center	52.0
100	Downtown Kearny	Hudson	NJ	Town Center	52.0
101	South Stamford	Fairfield	CT	Downtown Adjacent	51.7
102	DUMBO	Brooklyn	NY	Downtown Adjacent	51.5
103	Bloomfield Ave.	Essex	NJ	Town Center	51.4
104	Downtown White Plains	Westchester	NY	Downtown	50.8
105	Great Neck	Nassau	NY	Town Center	50.6
106	Bay Street Corridor	Staten Island	NY	Urban Commercial	50.4
107	Downtown Stamford	Fairfield	CT	Downtown	50.0
108	Downtown Bridgeport	Fairfield	CT	Town Center	49.6
109	Downtown Poughkeepsie	Dutchess	NY	Town Center	49.1

RANK	WALKUP NAME	COUNTY/BOROUGH	STATE	WALKUP TYPE	SOCIAL EQUITY INDEX
110	Peekskill	Westchester	NY	Town Center	49.1
111	Red Bank	Monmouth	NJ	Town Center	49.1
112	South Orange	Essex	NJ	Town Center	48.8
113	Kingston	Ulster	NY	Town Center	48.3
114	Dover	Morris	NJ	Town Center	48.2
115	Downtown Linden	Union	NJ	Town Center	48.1
116	Cedarhurst	Nassau	NY	Town Center	47.8
117	Patchogue	Suffolk	NY	Town Center	47.8
118	Englewood	Bergen	NJ	Town Center	47.6
119	Nutley	Essex	NJ	Town Center	47.5
120	Morristown	Morris	NJ	Town Center	47.3
121	Newburgh	Orange	NY	Town Center	47.2
122	Downtown Summit	Union	NJ	Town Center	47.2
123	Spring Valley	Rockland	NY	Town Center	47.1
124	Downtown Long Beach	Nassau	NY	Town Center	46.5
125	New Dorp	Staten Island	NY	Urban Commercial	45.7
126	Downtown Middletown	Orange	NY	Town Center	45.7
127	Westfield	Union	NJ	Urban Commercial	45.1
128	Cranford	Union	NJ	Town Center	44.5
129	Downtown Teaneck	Bergen	NJ	Town Center	44.3
130	Princeton	Mercer	NJ	Urban University	43.9
131	Riverhead	Suffolk	NY	Town Center	43.9
132	Norwalk	Fairfield	CT	Town Center	43.7
133	Downtown Greenwich	Fairfield	CT	Town Center	42.5
134	Ossining	Westchester	NY	Town Center	42.3
135	Downtown Beacon	Dutchess	NY	Town Center	42.2
136	Springfield Township	Union	NJ	Town Center	41.6
137	Downtown Union	Union	NJ	Town Center	40.1
138	Glen Cove	Nassau	NY	Town Center	39.6
139	Downtown Toms River	Ocean	NJ	Town Center	39.5
140	Downtown Ridgewood	Bergen	NJ	Town Center	38.8
141	Bronxville	Westchester	NY	Town Center	37.7
142	Hewlett	Nassau	NY	Town Center	37.7
143	Downtown Scarsdale	Westchester	NY	Town Center	34.7
144	Port Washington	Nassau	NY	Town Center	33.8
145	Tenafly	Bergen	NJ	Town Center	33.3
146	Huntington	Suffolk	NY	Town Center	33.1
147	Downtown Garden City	Nassau	NY	Town Center	28.2
148	Larchmont	Westchester	NY	Town Center	27.0
149	Darien	Fairfield	CT	Town Center	12.6



FUTURE WALKUPS

Emerging & Potential WalkUPs

In addition to the established WalkUPs listed in the Economic and Social Equity Performance Rankings, we also identified where WalkUPs may develop in the future.

The WalkUPs identified in the rankings are established WalkUPs—those that have the critical mass of office or retail space to be regionally significant:

- **WALK SCORE:** Average value ≥ 70.5
- **INTERSECTION DENSITY:** Average ≥ 100 per square mile
- **OFFICE & RETAIL SPACE:**
 - **Office:** ≥ 1.4 million square feet and/or
 - **Retail:** ≥ 340,000 square feet

However, there are two other categories which have particular interest to existing places and future development: Emerging and Potential WalkUPs.

- **EMERGING WALKUPS:** *Walkable urban places that are just short of being established and fall into two categories based on development trajectory:*
 - **Walkable Neighborhood-to-WalkUP:** These places lack the office and/or retail square footage to meet the regionally significant threshold. They tend to be Walkable Neighborhoods that may be evolving into WalkUPs.
 - **Drive-In-to-WalkUP:** These places tend to be Edge Cities that (1) do not have the walkability to be considered regionally significant and (2) have product offerings built in the 1970s and 80s that no longer align with current 21st-century market demand. Development of these places from Drive-Ins to WalkUPs presents the most significant opportunity to increase walkable urbanism in the tri-state region.

- **POTENTIAL WALKUPS:** *Places that show little in the way of actual development that is walkable urban but have one or more of the following characteristics:*
 - **Defined place** by government or a government entity
 - **Zoning** in place for mixed-use, walkable urban development
 - **Transit**, planned or in place, such as commuter rail or MTA stations, surrounded by surface parking lots or low-density development
 - **Political will** to become a walkable urban place, though currently without legislative or infrastructure improvements to make it happen

Identifying both Emerging and Potential WalkUPs demonstrates where the new growth in the metropolitan area is going to take place. This assists housing and community advocates in determining the requirements to maintain and increase affordable housing, real estate developers in determining where the future development options might be, and the public sector in deciding where future tax revenues will come from and how to provide infrastructure and affordable housing to anticipate this growth.

EMERGING WALKUPS

We have identified 25 areas that we would consider as Emerging WalkUPs, based on their momentum towards walkable urbanism and possibilities for additional inventory and jobs. One of the most outstanding examples is Roosevelt Island’s potential for becoming an Innovation District WalkUP as the Technion-Cornell Institute expands in that area.

Several of the Emerging WalkUPs are Walkable Neighborhoods that have opportunities for infill development. These areas already have walkable urbanism, but they lack the level of inventory to constitute a WalkUP. A context-sensitive approach to adding housing, office, and retail inventory in these Walkable Neighborhoods would move them towards becoming regionally significant WalkUPs.

Other areas, such as Hackensack and Teaneck, contain both Drive-Ins and Walkable Neighborhoods. Here there are opportunities to convert what are now job centers into more walkable areas, expanding the regional economy overall in the process.

Emerging:

#	WALKUP NAME	COUNTY/BOROUGH	STATE	COMMENTS	CURRENT LAND USE OPTION
1	Jacobi Center	Bronx	NY	New Metro North stop planned	Walkable Neighborhood
2	Roosevelt Island	Manhattan	NY	Technion-Cornell Institute	Walkable Neighborhood
3	Maspeth	Queens	NY	Triboro Line	Walkable Neighborhood
4	Forest Ave.	Staten Island	NY	Potential BRT	Walkable Neighborhood
5	Farmingdale	Nassau	NY		
6	Garden City / Nassau Hub	Nassau	NY	Job center, opportunities for walkability	Drive-In & Walkable Neighborhood
7	Inwood / Lawrence	Nassau	NY	Opportunities for infill development	Walkable Neighborhood
8	Mineola	Nassau	NY		
9	Downtown Amityville	Suffolk	NY	Opportunities for infill development	Walkable Neighborhood
10	Downtown Babylon	Suffolk	NY	Opportunities for infill development	Walkable Neighborhood
11	Wyandanch	Suffolk	NY		
12	Larchmont	Westchester	NY	Opportunities for infill development	Walkable Neighborhood
13	North Yonkers	Westchester	NY	Opportunities for infill development	Walkable Neighborhood
14	Mt. Vernon (West)	Westchester	NY	Current rezoning	Walkable Neighborhood
15	Pelham	Westchester	NY	Opportunities for infill development	Walkable Neighborhood
16	McGinley Square	Hudson	NJ	Opportunities for infill development	Walkable Neighborhood
17	Edgewater	Bergen	NJ	Opportunities for infill development	Walkable Neighborhood
18	Hackensack	Bergen	NJ	Job center, opportunities for walkability and infill development	Drive-In & Walkable Neighborhood
19	Teaneck	Bergen	NJ	Job center, opportunities for walkability and infill development	Drive-In & Walkable Neighborhood
20	Elizabeth	Union	NJ	Opportunities for infill development	Walkable Neighborhood
21	Union Township	Union	NJ	Job center, opportunities for walkability and infill development	Drive-In & Walkable Neighborhood
22	Rahway	Union	NJ	Opportunities for infill development	Walkable Neighborhood
23	Bloomfield	Essex	NJ	Rail station, opportunities for walkability and infill development	Drivable Sub-division
24	Maplewood	Essex	NJ	Opportunities for infill development	Walkable Neighborhood
25	South Bridgeport	Fairfield	CT	Opportunities for infill development	Walkable Neighborhood

POTENTIAL WALKUPS

We have identified 15 Potential WalkUPs, areas that are presently Drive-Ins but have additional opportunity for walkable urbanism. Drive-Ins are regionally significant areas and contain significant numbers of jobs, but they lack walkable infrastructure. In these Drive-Ins, conditions exist that make it possible to transform the area into a WalkUP. For example, job clusters in the Greater Englewood, N.J., area can capitalize on an existing destination, such as the hospital. Another example is the Mall at Short Hills, which provides a retail destination that can be converted into a broader walkable destination.

Potential:

#	WALKUP NAME	COUNTY/ BOROUGH	STATE	COMMENTS	CURRENT LAND USE OPTION
1	Hicksville	Nassau	NY	Job center, opportunities for walkability	Drive-In
2	Manhasset	Nassau	NY	Job center, opportunities for walkability	Drive-In
3	Islip	Suffolk	NY	Job center, opportunities for walkability	Drive-In
4	Melville	Suffolk	NY	Job center, opportunities for walkability	Drive-In
5	Port Jefferson	Suffolk	NY	Opportunities near the hospital	Drive-In
6	Harrison	Westchester	NY	Job center, opportunities for walkability	Drive-In
7	Rye	Westchester	NY	Job center, opportunities for walkability	Drive-In
8	Scarsdale / Greenville	Westchester	NY	Job center, opportunities for walkability	Drive-In
9	Greater Englewood	Bergen	NJ	Job center, opportunities for walkability	Drive-In
10	Short Hills	Essex	NJ	Retail destination, opportunities for walkability	Drive-In
11	Mountain Lakes	Morris	NJ	Job center, opportunities for walkability	Drive-In
12	Jersey Gardens	Union	NJ	Job center, opportunities for walkability	Drive-In
13	East Bridgeport	Fairfield	CT	Job center, opportunities for walkability	Drive-In
14	East Norwalk	Fairfield	CT	Job center, opportunities for walkability	Drive-In
15	West Haven	New Haven	CT	Job center, opportunities for walkability	Drive-In



Conclusions

The tri-state region has shifted toward building walkable urban product—office, retail, housing, hotel, and even industrial—more so than any other metropolitan area in the country. Yet, it is still a region out of balance.

The tri-state region is a tale of two metros. It is the most walkable metro in the country, yet it also contains more than 11,000 square miles of drivable sub-urban development. Though walkable urban places are growing rapidly with substantial valuation per square foot premiums, they are confined to less than 2.5 percent of the region. Low income households pay less for combined housing and transportation in walkable urban places and have access to more job opportunities, yet the “rent is too damned high.”

Walkable urban development was the predominant development form around the world for six millennia until low-density, drivable sub-urban development emerged in the United States in the 20th century. Large-scale, drivable sub-urban development was pioneered on Long Island with the development of Levittown in 1947, which became the national model for mass production of this new form of metropolitan development.

This research has shown that the tri-state region has structurally shifted toward walkable urban development to a degree greater than any other metropolitan area in the country. But the region is still out of balance.

With 90 percent of new real estate built in this real estate cycle being walkable urban with valuation premiums that are 2.5 times drivable sub-urban development, the tri-state region is responding to the pent-up market demand.

Yet this is not happening to the extent required, and public policy is generally out of step with the future economic trends, creating a substantial affordable housing crisis and lost economic opportunities.

Meeting the pent-up demand for walkable urbanism will be the foundation for the tri-state region’s regional economy. It will boost economic output, create jobs, generate additional tax revenue, and allow for more residents to enjoy the benefits of living in walkable urbanism.

The shift towards walkable urbanism has major implications for policy makers and real estate investors. WalkUPs and Walkable Neighborhoods will continue to increase in valuation and growth while drivable sub-urban real estate locations are at risk of continued stagnation and even significant economic decline. This is a structural shift in how the region is building itself, driven by underlying economic fundamentals. Public policy and investment strategies must change to address this new reality.

Continued growth in walkable urbanism requires public policy changes and significant adaptation by the real estate and finance industry. The built environment represents 35 percent of our nation’s wealth, the largest asset class in the economy.⁶⁵ The present moment is a major challenge—and opportunity—for everyone connected with the built environment. This includes real estate developers, investors, land use regulators, infrastructure providers, housing and community advocates, public sector managers, academics, and everyday residents. However, it requires rethinking the way we plan, invest, and manage the built environment—as well as a conscious approach to improving social equity.

RECOMMENDATIONS

Below are three conclusions of the research and recommendations RPA’s Fourth Regional Plan should address for the next phase of growth:

1 EXPAND & BUILD MORE WALKABLE URBAN PLACES

The vast majority of walkable urban development is in a minuscule 2.5 percent of the tri-state region’s land. This has resulted in world-record land prices, the primary reason for valuation premiums. The cost of walkable urban construction is higher than drivable sub-urban due to higher density construction costs and, possibly, the need to be more architecturally significant in dense urban areas than in sub-urban developments. However, the major reason for these valuations is artificially inflated land prices.

The most important public policy recommendation is to rezone and encourage the development of more walkable urban places, both WalkUPs and Neighborhoods. Specifically, we should aim to double the amount of land in the region that is legally entitled to build walkable urban places to five percent.

The major source of that rezoned land should be areas immediately adjacent to existing rail transit stations, both MTA and commuter rail, that are woefully under-utilized. More than 90 percent of the 149 established WalkUPs have rail transit connectivity. However, just 57 percent commuter rail stations are within a half mile of a WalkUP or Walkable Neighborhood. While not all rail stations should be in regionally significant WalkUPs, there is market

demand for more. Many jurisdictions would welcome the increased economic activity and tax base. This includes the two types of WalkUPs most likely to emerge around rail transit: Urban Commercial in New York City and the region’s core, and Town Centers in the suburbs.

The tri-state region lags behind many metropolitan areas in a major development pattern: the redevelopment of drivable sub-urban locations, especially business parks and regional malls. This research clearly shows a trend away from the business parks and regional malls that are losing both relative and absolute market share in this economic cycle. Across the country, drivable sub-urban locations are being converted into walkable urban places; Notable examples include Belmar in suburban Denver, Colo.; The Pike District in Montgomery County, Md.; and Tysons Corner in Fairfax County, Va. Many drivable sub-urban locations do not have rail transit today, but experience has shown that is not a requirement to begin the transformation.

Walkable urbanism calls for dramatically different development approaches than drivable sub-urbanism, with regards to design and planning, regulation, financing, and construction. Taking a drivable sub-urban approach to walkable urban development nearly guarantees failure, since the needs and context are so fundamentally different. To promote the adoption of best practices and respond nimbly to opportunities, walkable urbanism benefits from another level of civic supervision: place management. Place managers develop the strategy and provide the day-to-day management for WalkUPs, creating a distinctive sense of place where investors and residents invest in the long term.

The major conclusion of this research is that the tri-state region has great opportunity to add more walkable urban development through the growth of walkable downtowns and neighborhoods in the suburbs. More than 83 percent of the walkable urbanism is in New York City and close-in places like Yonkers, New Rochelle, downtown Jersey City and Hoboken. This compares to metropolitan Washington where the walkable urbanism splits 50-50 between the District of Columbia and the suburbs. Metropolitan Washington also has examples of both drivable sub-urban redevelopment and another WalkUP type that is not evident in the tri-state region: Redeveloped Greenfield/Brownfield WalkUPs. While investment interest in this development type is likely to be lower due to the substantial upfront costs required, the tri-state region offers many opportunities for the redevelopment of failing drivable suburban locations into WalkUPs.

In the long term, increasing the supply of walkable urban land will relatively reduce their existing valuation premiums, making it more affordable for all households and businesses. There is no shortage of land in the tri-state region; there is instead a shortage of walkable urban land. Restrictive zoning and well-known barriers to growth, as a result of NIMBY community opposition, are the primary cause of this. There are a number of proven tactics to educate opponents about the value of rezoning their communities for more walkable urbanism:

- **Crowd-Sourced Planning:** Open the planning of a potential walkable urban place to all citizens through an online application that democratizes the process and encourages participation. This also allows for participation without attendance

at numerous meetings that may be held at inconvenient times and places.

- **Emulate Regional Models:** Visit and understand the benefits of walkable urban places, such as the easy access restaurants, shopping, parks, community events, and work (oftentimes by foot). Also understand how local jurisdictions benefit from walkable urbanism by the resulting increased tax base.
- **Emulate National Models:** If local examples of walkable urbanism are not available, there are now many examples in other metropolitan areas outside of the tri-state area that could be visited.
- **Adopt Model “Form-based Code” Zoning:** There are many off-the-shelf models of zoning that will allow for mixed-use, walkable urban development that can be easily adjusted to meet local context. Local jurisdictions can adopt these in the defined area—be it the redevelopment of a drivable sub-urban business park or regional mall, an urban commercial district, or a town center—in order to incentivize walkable urbanism.

2 ENGAGE IN CONSCIOUS SOCIAL EQUITY STRATEGIES

The research shows that walkable urban places are more affordable for low-income households and provide access to more jobs and transportation options in the tri-state area. This is due to their (surprisingly) lower housing costs for low-income households, relative to drivable sub-urban locations, and lower transportation costs. Walkable urban areas also have the greatest racial and ethnic diversity in the region,

as well as accessibility to many more employment opportunities within commuting distance.

However, the costs of walkable urban housing, while lower than drivable sub-urban housing, are still too high. The increased land availability addressed above will take many years to have significant impact, so a short- to middle-term set of conscious affordable housing strategies should be implemented.

The tri-state area, especially New York City, has a commendable history of providing public and subsidized housing and instituting rent regulations. This has possibly resulted in the relatively lower housing costs for low-income households in walkable urban places, in the face of the substantial valuation premiums this research quantified. Our research also found that low-income households have a difficult time affording housing if they move into the high-valuation WalkUPs, and many Walkable Neighborhoods, without government assistance.

Therefore, there needs to be an aggressive affordable housing strategy in walkable urban places to minimize displacement and provide more affordable housing as the trend of developing more walkable urban places continues over the next generation. Specific tactics could include:

- **Place management organizations**, such as business improvement districts, community development corporations, or other locally based nonprofits, could be empowered to encourage and assist in the development of affordable housing and in the stewardship of government or privately gifted land to ensure permanently affordable housing.

- **Inclusionary zoning**, which requires a minimum percentage (usually 10-20) of affordable housing, in each new development. It is important to apply inclusionary housing provisions over as large a geography as practical so that the burden of market-rate housing subsidizing affordable housing is borne by as many areas of the local jurisdiction as possible. Ultimately, inclusionary housing lowers land values, since there is less residual profit from the development.
- **Preserve and develop public and subsidized housing at the local jurisdiction level.** This is the most direct approach to growing inventory of affordable housing choices. While local taxpayers should assume some responsibility for providing it, state and federal subsidies and incentives to localities will also need to be increased.
- **Ancillary housing should be made legal, if it is not.** There are numerous unoccupied attics, basements, and other ancillary spaces that could be turned into rental housing units with minor redesign. In most jurisdictions, providing ancillary housing, sometimes known as granny flats, is not legal. Making legal the use of this existing and underutilized asset can assist homeowners by providing extra income while substantially increasing the supply of affordable housing.
- **Resale fees for market rate housing closing.** Many jurisdictions charge a nominal fee (under one percent of the sale price) for the re-sale of a market-rate house, with the proceeds deposited in an affordable housing investment fund. While this funding goes up and down with the economic cycle, it can raise substantial sums without too much disruption of the market.

3 SUBSTANTIALLY INVEST IN TRANSPORTATION OPTIONS, ESPECIALLY RAIL & BUS TRANSIT

The importance of investing in transportation infrastructure, particularly existing rail and bus transit, as well as paths for biking and walking, cannot be underestimated. Transportation has always been the most significant determining factor shaping the built environment. Rail transit, in particular, facilitates walkable urbanism, as evidenced by the finding in this research that 93 percent of the region's WalkUPs have rail transit accessibility. There will always be cars, and therefore roads, for the foreseeable future, will continue to be a crucial element in a transportation system. However, automobile transportation should be considered as one of many transportation options consumers should have. Expensive as investments in rail transit and walkable urban infrastructure may be, there are growing indications, as this research shows, that walkable urban development generates higher economic development and property valuations, and hence property taxes, than drivable sub-urban development.

Transportation infrastructure that supports walkable urban development is the best investment for the future economy and tax base of the tri-state region.

The major question is where the funding will come from. Answers will certainly include the use of two new U.S. Department of Transportation low-cost loan programs, referred to as TIFIA⁶⁶ and RRIF.⁶⁷ Both have been recently modified to finance not just rail transit, but also the surrounding infrastructure if it is walking distance to the station. One of these programs, RRIF, can partially finance private real estate projects in



the walkable urban place. There are tens of billions of dollars of available finance capacity, particularly in the RRIF program.

The challenge of transit infrastructure financing is developing cash flow sources to repay these loans, which tend to be 35-year amortization periods. There are many sources that should be considered:

- **Increase Sales Tax:** Dedicate existing, or increase, sales or other local taxes that would be committed to servicing the loan. Metropolitan Los Angeles has recently raised sales taxes to finance \$120 billion of transit investment.
- **Catalytic Development Companies:** Create a catalytic development company, capitalized by deep pocket private investors, universities, and foundations, to “push the fast-forward button” on walkable urban development, especially around transit stations. Catalytic developers can assume control of public, nonprofit, and donated land for the development of affordable and workforce housing. The cash flows from the development projects would be dedicated to servicing the loans.
- **Value Capture:** Negotiate with developers and private landowners around transit stations to engage in value capture. This is capturing a portion of the anticipated upside of development that has been sparked by the rail transit. This technique is similar to how rail transit was financed 100 years ago and has been re-introduced in many international cities and in some U.S. metros, such as Washington, D.C.



APPENDICES

Endnotes

1. Regional Plan Association (2017), "Where We Work," accessed March 2017, <http://www.rpa.org/regions>.
2. Gross Regional Product (GRP) in this report is estimated using value added as defined by IMPLAN. GRP estimates were from IMPLAN models of all 31 counties for 2014. The U.S. Bureau of Economic Analysis estimate for the New York region's 2014 GRP is \$1.537 trillion. Our estimate differs from the BEA estimate for two reasons. First, the New York-Newark-Jersey City, NY-NJ-PA MSA that the BEA uses is a different geographical definition than the 31-county region used in this report. Secondly, IMPLAN estimates use a value-added approach. See IMPLAN at <http://www.implan.com>. For a definition of "value added" see http://support.implan.com/index.php?option=com_glossary&letter=V&id=121.
3. Leinberger, Chris and Michael Rodriguez (2016), *Foot Traffic Ahead: Ranking Walkable Urbanism in America's Largest Metros*, 2016, Washington: George Washington University School of Business, accessed March 2017, http://business.gwu.edu/wp-content/uploads/2016/06/CREUA_Foot-Traffic-Ahead_2016.06.14.pdf.
4. Leinberger and Rodriguez (2016).
5. Leinberger and Rodriguez (2016).
6. Leinberger and Rodriguez (2016).
7. Weighted average of net absorption for product types, weighed by square footage of inventory.
8. Regional Plan Association (2017), *Pushed Out: Housing Displacement in an Unaffordable Region*, New York: Regional Plan Association, accessed March 2017, <http://library.rpa.org/pdf/RPA-Pushed-Out-Housing-Displacement-in-an-Unaffordable-Region.pdf>.
9. Walk Score (2017), "How it Works," accessed March 2017, <https://www.walkscore.com/how-it-works>.
10. Glaeser, Edward and Joshua Gottlieb (2009), *The Wealth of Cities: Agglomeration Economies and Spatial Equilibrium in the United States*, Journal of Economic Literature, American Economic Association, Vol 47(4), 983-1028.
11. See: Hutchinson, Richard (2009), *The SAGE Encyclopedia of Urban Studies*, Thousand Oaks: SAGE Publications; Modelski, George (1997), *Cities of the Ancient World: An Inventory (-3500 to -1200)*, Seattle: University of Washington. These works build upon the definitions of urban historians Louis Wirth and Tertius Chandler, and state that the first cities developed in the Mesopotamia region between 4,500 and 3,100 BCE.
12. Lang, Robert E. (2003), *Edgeless Cities: Exploring the Elusive Metropolis*, Washington: Brookings Institution.
13. Leinberger, Christopher and Mason Austin (2012), *The WalkUP Wake-Up Call: Atlanta*, Washington: George Washington University School of Business, accessed March 2017, http://business.gwu.edu/wp-content/uploads/2016/02/CREUA_WalkUP-Atlanta-2013.pdf.
14. Leinberger, Christopher and Patrick Lynch (2015a), *The WalkUP Wake-Up Call: Boston*, Washington: George Washington University School of Business, accessed March 2017, http://business.gwu.edu/wp-content/uploads/2016/02/CREUA_Walkup-Wake-Up-Call-Bostonb.pdf.
15. Leinberger, Christopher and Patrick Lynch (2015b), *The WalkUP Wake-Up Call: Michigan Metros*, Washington: George Washington University School of Business, accessed March 2017, <http://business.gwu.edu/wp-content/uploads/2015/06/WalkUp-Wake-Up-Call-Michigan-Metros.pdf>.
16. Leinberger, Christopher (2012), *The WalkUP Wake-Up Call: Washington, D.C.*, Washington: George Washington University School of Business, accessed March 2017, http://business.gwu.edu/wp-content/uploads/2016/02/CREUA_DC-Walkupd.pdf.
17. Leinberger, Christopher and Patrick Lynch (2014), *Foot Traffic Ahead: Ranking Walkable Urbanism in America's Largest Metros*, Washington: George Washington University School of Business, accessed March 2017, http://business.gwu.edu/wp-content/uploads/2016/02/CREUA_Foot-Traffic-Ahead.pdf.
18. Leinberger and Rodriguez (2016).

19. Alfonso, Mariela and Christopher Leinberger (2012), *Walk This Way: The Economic Promise of Walkable Places in Metropolitan Washington, D.C.*, Washington: Brookings Institution, accessed March 2017, <https://www.brookings.edu/research/walk-this-waythe-economic-promise-of-walkable-places-in-metropolitan-washington-d-c/>.
20. Leinberger and Austin (2012).
21. Leinberger and Lynch (2015a).
22. Leinberger (2012).
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24. Leinberger and Rodriguez (2016).
25. Alfonso and Leinberger (2012).
26. U.S. Environmental Protection Agency (2013), Smart Location Database v2.0, accessed March 2017, <https://www.epa.gov/SMARTGROWTH/SMART-LOCATION-MAPPING#Trans45>. Census block groups ascribed to study geographies using area weights.
27. U.S. Census (2014), Longitudinal Employer-Household Dynamics, Origin-Destination Employment Statistics 7.2 (LODES 7.2). Workplace Area Characteristics, all jobs, 2014, accessed March 2017, <https://lehd.ces.census.gov/data/>. Census block data was ascribed to each geography using area weights.
28. Average rents in this report are reported as vacancy-adjusted average rent divided by one-plus the vacancy rate. Missing rents for any geography were imputed using average rental rate for the land-use option in each county.
29. Valuations and valuation per square foot calculated for office, retail, industrial, and multi-family product types. Valuation per square foot for other product types imputed as follows: sports and entertainment using the square-foot weighted average of office and retail; flex and specialty space using the weighted average of office, retail, and industrial; hospital as the weighted average of office and retail; and owner-user space as the weighted average of office, retail, and industrial.
30. This report uses CoStar five-year average cap rates. Missing cap rates for a geography were imputed using the averages for land-use option type in each county.
31. Using Cushman and Wakefield expert interviews, this report uses operating ratios of 35% for New York City, and 30 percent for the rest of the tri-state region.
32. Redfin Estimate data as of February 2017. Redfin data not available for all properties. Missing inventory ratios for each geography was provided by Redfin, which allowed for imputation of a geography's true inventory. Missing valuations were imputed using average dollar per square foot valuations at the county level.
33. New York City Office of the City Register and Department of Finance (2016), accessed March 2017, <http://www1.nyc.gov/site/finance/taxes/property-assessments.page>.
34. Owner-user space inventory imputed using ratio of reported space by CoStar against inventory as reported by the New York City Office of the City Register and Department of Finance, 2016. This estimate was developed for each land-use option. The ratios were applied to the rest of the tri-state region, reflecting a consistent "missing owner-user space" rate for CoStar data throughout the tri-state region.
35. U.S. General Service Administration, 2016, direct data provided. Point-level inventory data for federal non-military space.
36. U.S. Census (2014). Census block data was ascribed to each geography using area weights.
37. "Value added" as defined by IMPLAN is a measure of GRP. IMPLAN defines it as follows: "The difference between an industry's or an establishment's total output and the cost of its intermediate inputs. It equals gross output (sales or receipts and other operating income, plus inventory change) minus intermediate inputs (consumption of goods and services purchased from other industries or imported). Value added consists of compensation of employees, taxes on production and imports less subsidies (formerly indirect business taxes and nontax payments), and gross operating surplus (formerly "other value added") (BEA). Gross value added is the value of output less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry or sector; gross value added is the source from which the primary incomes of the SNA are generated and is therefore carried forward into the primary distribution of income account. (SNA)
38. U.S. Environmental Protection Agency, Smart Location Database v2.0, Access to Jobs and Workers Via Transit Tool, 2013. Available at: <https://www.epa.gov/SMARTGROWTH/SMART-LOCATION-MAPPING#Trans45>. Census block groups ascribed to study geographies using area weights.
39. U.S. Department of Housing and Urban Development, Location Affordability Portal v 2.0, Location Affordability Index, 2013. Available at: <http://www.locationaffordability.info/lai.aspx>. Census block groups ascribed to study geographies using area weights.
40. Household Type 6, Renter, in the LAI Database.
41. U.S. Census (2015), American Community Survey, 2015 five-year estimate. Upper Contract Rent Quartile.
42. Regional Plan Association (2017), Land Use Entropy, direct data provided.
43. Katz, Bruce and Julie Wagner (2014), *The Rise of Innovation Districts: A New Geography of Innovation in America*, Washington: Brookings Institution, accessed March 2017, <https://www.brookings.edu/essay/rise-of-innovation-districts/>.
44. The data of this report does not contain detailed information on university space.
45. World Federation of Exchanges (2015), "Statistics," 2015 data, accessed March 2017, <https://www.world-exchanges.org/home/index.php/statistics>.
46. Net absorption is an indication of net leasing activity over a time period. It is the sum of all positive leasing activity (move-ins), and negative leasing activity (move-outs), and is measured in square feet.
47. Weighted average of net-absorption for income-producing product types, weighed by square footage of inventory.
48. Weighted average of net-absorption for income-producing product types, weighed by square footage of inventory.
49. Leinberger and Rodriguez (2016).
50. Glaeser and Gottlieb (2009).
51. Leinberger and Rodriguez (2016).
52. The Economic Performance Index is a measure from 0 to 100, with 100 indicating the highest economic performance. It is based on sub-measures as listed in the Economic Performance section. Each component starts with a sub-sample of WalkUPs, Drive-Ins, and select Walkable Neighborhoods (those that are discretely spate from a WalkUP). Each component measure is standardized as a z-score, or the number of standard deviations from the mean. The measures are then combined into a weighted average, using the weights listed. Finally, the z-score measures are converted to an index from 0 to 100, using a normal distribution where 0 equals 0.1 times the minimum observed z-score, and 100 equals 1.1 times the maximum observed z-score. The Economic Performance Rankings include only geographies classified as WalkUPs.
53. *US Census (2014), Longitudinal Employer Household Dynamics, LEHD, 2004 - 2014. "All jobs" at place of employment. "Rest of metro" as New York-Newark-Jersey City NY-NJ-PA CBSA, less New York City*
54. We note that statistical relationships in this section should be taken with caution. They are utilized to illustrate the trends and elasticities, and indicate correlation but not necessarily causation. Further statistical analysis and study would be required to establish causation.
55. For more on elasticity, see: Anderson, Patrick, Richard McLellan, Joseph Overton, and Gary Wolfram (1007), "Price Elasticity of Demand," Scholars at Harvard, accessed March 2017, https://scholar.harvard.edu/files/alada/files/price_elasticity_of_demand_handout.pdf. An elasticity is a measure of the percent change in one item versus the percent change in the second item. In this first case, we can interpret an elasticity as the percent change in Walk Score versus the percent change in GRP per job. Elasticities indicate the direction of the relationship (positive or negative). An absolute value of elasticity of between 0 and 1 indicates an inelastic relationship, meaning diminishing marginal returns, or decreasing returns to scale; greater than one indicates increasing returns to scale; 1 is unit elastic, meaning a perfect 1-to-1 relationships.

56. Due to the non-linear relationship of the variables of interest, all regressions follow the following functional form: $\log(Y)=b_0+b_1*\log(x)+b_2*\log(x)*WalkUP$ Y is the dependent variable of interest, X is the independent variable where 1=WalkUP and 0=Drive-In. The b1 and b2 are elasticities of X on Y. Because of the interaction term, the elasticity of Drive-Ins is b1, and the elasticities of WalkUPs is b1+b2.
57. DeVol, Ross, I-Ling Shen, Armen Bedroussian, and Nan Zheng (2013), *A Matter of Degrees: The Effect of Educational Attainment on Regional Economic Prosperity*, Santa Monica: The Milken Institute, accessed March 2017, <http://www.milkeninstitute.org/publications/view/564>.
58. Miller, Claire Cain (2014, October 20), "Hello, Buffalo: Urban Migration of College Graduates Is Expanding" *The New York Times*, p. A-15, accessed online March 2017, https://www.nytimes.com/2014/10/20/upshot/where-young-college-graduates-are-choosing-to-live.html?_r=0.
59. Florida, Richard (2014), *The Rise of the Creative Class: Revisited-Revised and Expanded*, New York: Basic Books.
60. "Knowledge industry" in this report is defined as the sum of the following 2- NAICS sectors: 51-Information; 52-Finance and Insurance; 53-Real Estate and Rental Leasing; 54-Professional, Scientific, and Technical Services; 55-Management of Companies and Enterprises; 61-Educational Services; 62-Health Care and Social Assistance; 81-Other Services (Except Public Administration); 92-Public Administration.

61. Leinberger and Rodriguez (2016).
62. The Social Equity Index is a measure from 0 to 100, with 100 indicating the highest social equity performance. It is based on sub-measures as listed in the Social Equity section. Each component starts with a sub-sample of WalkUPs, Drive-Ins, and select Walkable Neighborhoods (those that are discretely spate from a WalkUP). Each component measure is standardized as a z-score, or the number of standard deviations from the mean. The measures are then combined into a weighted average, using the weights listed. Finally, the z-score measures are converted to an index from 0 to 100, using a normal distribution where 0 equals 1.1 times the minimum observed (negative) z-score, and 100 equals 1.1 times the maximum observed (positive) z-score. The Social Equity Rankings include only geographies classified as WalkUPs.
63. Due to the non-linear relationship of the variables of interest, all regressions follow the following functional form: $\log(Y)=b_0+b_1*\log(x)+b_2*\log(x)*WalkUP$ Y is the dependent variable of interest, X is the independent variable where 1=WalkUP and 0=Drive-In. The b1 and b2 are elasticities of X on Y. Because of the interaction term, the elasticity of Drive-Ins is b1, and the elasticities of WalkUPs is b1+b2.
64. RPA's Dissimilarity Index measures of the level of overall integration or segregation between two groups in a geography, ranging from 0 to 1, with 1 being the highest level of integration, and 0 being high levels of segregation. The original dissimilarity index reported by RPA was

the inverse, and this number was adjusted to convert it into a positive measure, with higher values being more integration instead of more segregation. RPA calculated Dissimilarity Index for all combinations of the non-Hispanic white, black, Asian, Hispanic, and other race categories as reported by the United States census. The dissimilarity index referenced measures the relative integration between the non-Hispanic white population and the black and Hispanic population in a given geography.

65. Roulac, Stephen, (2004), "Real Estate: The Most Imperfect Asset," Harvard Business School, accessed March 2017, <http://hbswk.hbs.edu/item/real-estate-the-most-imperfect-asset>.
66. U.S. Department of Transportation (2017), "Overview", accessed March 2017, <https://www.transportation.gov/buildamerica/programs-services/tifa/overview>.
67. U.S. Federal Railroad Administration (2017), "Railroad Rehabilitation Improvement and Financing," accessed March 2017, <https://www.fra.dot.gov/Page/P0128>.

Acknowledgments

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THANK YOU:

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Christine Patton of **Patton Creative** for
creative direction and production of the report

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CoStar
Cushman and Wakefield
Redfin
Smith Travel Research
Walk Score

PRIVATE SECTOR FUNDERS & ADVISORS:

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