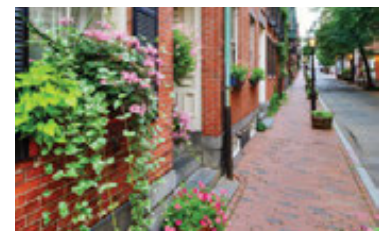
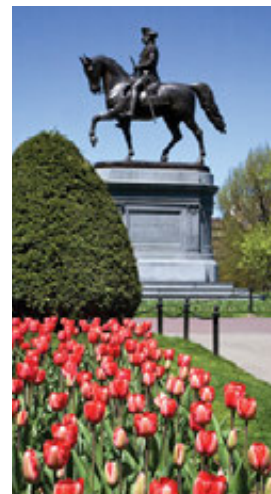




The WalkUP *Wake-Up* Call: Boston

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WAKEFIELD



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EXECUTIVE SUMMARY

Metropolitan Boston is leading the country toward a walkable urban future.

That future is materializing on less than six percent of the metropolitan area's land — the same six percent that houses 37 percent of the region's real estate square footage, 40 percent of its population, and 42 percent of employment.

In the Boston metropolitan area, walkable urbanism adds value. On average, all of the product types studied, including office, retail, hotel, rental apartments, and for-sale housing, have higher values per square foot in walkable urban places than in low-density drivable locations. These price premiums of 20 to 134 percent per square foot are strong indicators of pent-up demand for walkable urbanism.

Walkable urban places are now gaining market share over drivable locations for the first time in at least half a century in hotel, office and rental apartment development. This is good news for people moving to those locations, since households in walkable urban places spent less on housing and transportation (43 percent of total

household budget) than households in drivable locations (48 percent), primarily due to lower

transportation costs. In addition, property tax revenues generated in walkable urban places are substantially higher than in drivable locations on a per acre basis.

Previous research has demonstrated the correlation between walkable urban places and both the education of the metropolitan work force and the GDP per capita. The current research confirms this finding: for example, since 2000, 70 percent of the population growth of young, educated workers has occurred in the walkable urban places of the Boston region.

Despite the strong momentum toward a more walkable urban future for the region, there are challenges and causes for concern. In many walkable urban places, proximity to transit is a major requirement for households and employers. However, increasing congestion in the core transit system and system fragility in the face of extreme events (such as was experienced during the blizzards of 2015) diminish the value of the system and present substantial risks that may deter investors. As a result, public sector investments in MBTA capacity and resiliency are

prerequisites for the billions of dollars of private sector capital seeking to flow into walkable urban places over the coming decades.

Public transit, especially rail transit, activates walkable urbanism's potential for adding real estate value, and as this report demonstrates, that potential is ample. Therefore, policymakers must weigh the costs of funding transit against its power to increase tax revenues. With the right value capture tools in place, the increased value that transit supports could be used to fund at least a portion of the system's maintenance and future expansion.

We should also be concerned that, given the flow of capital into walkable urban places and the price premiums, the affordability of these places may be diminished. The resulting increased displacement of low-income residents to less accessible suburban locations would likely have substantial negative impacts on social equity, the environment and opportunity. As a result, it is critical to establish policies that will preserve existing affordable housing in walkable urban places and leverage private sector investments to enhance opportunities for disadvantaged families to live in high opportunity/high accessibility places. However, the ultimate solution to high housing and commercial costs is more walkable urban inventory, which will occupy less than 10 percent of the metro area's landmass. This new inventory will eventually drive down land costs, the primary reason for the price premiums.

INTRODUCTION

For decades, real estate practitioners, observers and scholars studying land use have looked through an urban-versus-suburban lens. It is not unlike the classic social science joke about the tipsy guest who drops his keys at the front door as he leaves a party. While searching under a streetlight at the curb, he is asked, "Why aren't you looking where you lost the keys?" He replies, "This is where the light is."

We have watched and analyzed the urban/suburban debate where the light was, even if that meant using the wrong approach with the wrong datasets. Our latest research, focused here on Metropolitan Boston, challenges those connected with the built environment (real estate and infrastructure), including developers, investors, regulators, infrastructure providers, social equity advocates, public sector managers, academics and citizens, to rethink the way we manage the 35 percent of our nation's wealth that is invested in the built environment.¹ This is an important recalibration that affects how we live and work and where we are educated, worship and entertained. To ignore this structural change would be akin to ignoring the impact of the drivable suburbs on the built environment more than a half-century ago.

This new research defines—in an entirely new way—the form and function of all land use in Metropolitan Boston's 3,119 square miles. This study then ranks performance for all land in the region based on two criteria: economics and social equity. The economic performance metric measures both the real estate valuations, as a proxy for GDP (a GDP measure does not exist below the metropolitan level) and the tax assessment that drives most local government tax revenues. The social equity performance metric measures access to economic opportunity and affordability in terms of both housing and transportation costs.

Today, there are two broad forms of metropolitan development:²

- **Drivable Sub-urban:** This development form has the lowest development density in metropolitan history. It features stand-alone real estate products, tends to be socially and racially segregated, and relies upon cars and trucks as the only viable form of transportation.
- **Walkable Urban:** This form of development has much higher density, has multiple real estate products (housing, office, retail, etc.) close to one another, employs multiple modes of transportation that get people and goods to the place and once there, is walkable.

Each form is found in both cities and suburbs. In the case of Metropolitan Boston, drivable sub-urban development can be found within Boston, in neighborhoods such as West Roxbury and Hyde Park, the many subdivisions throughout the suburbs. Likewise, Boston's Back Bay takes a walkable urban form, as does the newly opened Assembly Row, a \$1.3 billion transit-oriented mixed-use development in a once gritty, former industrial part of the city of Somerville. Both drivable sub-urban and walkable urban forms of development have market support and appeal.

Drivable sub-urban has been the dominant approach to real estate development for over 60 years. Today, that is reversing; the pendulum is swinging back to walkable urban development. Market demand for drivable sub-urban development, which became overbuilt and was a major cause of the mortgage meltdown that triggered the Great Recession, appears to be on the wane in the Boston metropolitan area. Meanwhile, there is such pent-up demand for walkable urban development—as demonstrated by rental and sales price per square foot premiums—it could take a generation of new construction to satisfy the demand for walkable urban development.

Meeting this demand for new development in walkable urban areas will be a boon to the economy. Much like drivable sub-urban development benefited selected jurisdictions in the second half

of the 20th century, this shift back towards walkable urbanism provides the opportunity that many urban neighborhoods, long suffering from disinvestment, have been waiting for. It will also put a foundation under the Boston regional economy and boost local government tax revenues, much like drivable sub-urban development benefited the economy and selected jurisdictions in the second half of the 20th century.

Walkable urban development calls for dramatically different approaches than drivable sub-urban to urban design and planning, regulation, financing and construction. It also requires the introduction of a new industry: place management. This new field develops the strategy and provides the day-to-day management for walkable urban places, creating a distinctive "could only be here" place in which investors and residents invest for the long term.

The comparisons between different land use forms will help direct private sector investment decisions, public sector infrastructure investments, and public policy and household decisions about where to live, work and play. In addition, place management organizations could use the metrics developed in this report to assess year-over-year performance and progress made in achieving strategic objectives. Finally, the research can assist in setting urban policy of the Commonwealth, especially for economic development, housing and transportation.

KEY FINDINGS

- **The Boston market is showing substantial and growing pent-up demand for walkable urbanism, demonstrated by significant and increasing real estate premiums on average for walkable urban real estate over drivable sub-urban in all product types.**

Metro Boston is on the leading edge of the national structural shift towards walkable urbanism. The weighted-average valuation for walkable urban real estate is 37 percent higher than drivable sub-urban real estate in the region.

This premium has been growing since 2004 for for-sale residential and office, and since 2007 for retail.

The 2014 valuation premiums of walkable urban product types compared to drivable sub-urban are:

• OFFICE	134%
• HOTEL*	120%
• RENTAL APARTMENTS	54%
• RETAIL	41%
• FOR-SALE RESIDENTIAL	20%
• TOTAL	37%

* (only WalkUP premium over Edge City available)

- Walkable urbanism has successively increased its market share of new income property development (office, retail, hotel, rental apartments) over the last three real estate cycles. From 1992-2000, 27 percent of the region’s new income property development located in walkable urban places. That share increased to 39 percent in the 2001-2008 cycle, and stands at 46 percent for the most recent cycle (2009-present).

Those overall numbers hide important distinctions in walkable urbanism’s share by real estate product type. Office and hotel development appear to be leading the trend toward walkable urbanism while rental apartments have just begun to trend toward it. Retail continues to have a drivable sub-urban orientation.

The key real estate product not included in income property is for sale-residential. The available data indicates that it, like retail, is maintaining a drivable sub-urban orientation. Most for-sale residential square footage, including single-family and condominiums, continues to be developed in drivable suburbs. However, the data also shows that the homebuilding industry is not producing nearly as many for-sale units as it has historically. Single-family residential permits are dramatically down from historic peak levels during past economic expansions. For example, as Metro Boston nears the top

of this economic cycle, single-family residential permits per capita are lower than the trough in the late 1980s and early 1990s recession. The 20 percent average price premium for walkable urban for-sale residential may not be enough for the regional homebuilders to change their business model. The decline in single-family permits and the rise in multifamily construction, mostly rental, may also represent the consequence of demographic shifts. MAPC has projected that nearly two-thirds of housing demand in the coming decades could be for multifamily units.

- The harsh winter of 2014-15 showed how vulnerable the future of WalkUPs and Walkable Neighborhoods are, given the years of deferred maintenance and the need for expansion of the MBTA rail and bus transit system. Nevertheless, this research shows that the majority of economic growth in the region will be in walkable urban places. The lifeblood of this type of economic development is rail and bus transit, as well as bike friendliness and walkability. Not maintaining a “state of good repair” and expanding rail transit, but also bike and walking infrastructure, would put the economic development future of the region at risk.

ECONOMIC CONCLUSIONS

- There is a wide spectrum of economic performance among the WalkUPs. The most significant and active WalkUPs are in the region’s Inner Core adjacent to the MBTA rapid transit system. They have seen significant investment during the recent cycles and comprise a growing share of office, hotel, and rental housing in the region.
- From a public finance perspective, WalkUPs generate 12 times more property tax revenue per acre than Edge Cities. Walkable Neighborhoods generate six times more property tax revenue per acre than Drivable Sub-divisions. The above numbers refer to gross tax revenues, as opposed to net fiscal impact (revenues minus costs).

SOCIAL EQUITY CONCLUSIONS

- WalkUPs tend to offer high levels of accessibility, low transportation costs, and high opportunity in terms of proximity to employment. However, the cost of housing in WalkUPs is high and standardized test scores tend to be lower compared to the rest of the region. In contrast, Walkable Neighborhoods generally exchange higher affordability for average accessibility and opportunity. Edge Cities have reasonable opportunity levels, but low accessibility due to generally requiring car ownership, causing a corresponding increase in transportation costs. Drivable Sub-divisions are the least accessible, not particularly affordable due to the high transportation costs, and they do not provide many work opportunities as compared to WalkUPs. Nonetheless, they do offer lower housing costs for lower income families and the highest standardized test scores.
- Considering both housing and transportation costs, WalkUPs and Walkable Neighborhoods are more affordable than their drivable sub-urban counterparts. On average, a four-person family earning the median income and living in a WalkUP is projected to spend 42 percent of their income on housing and transportation and 43 percent in Walkable Neighborhoods, versus 45 percent in Edge Cities and 48 percent in Drivable Sub-divisions.
- There is large variation within the WalkUPs themselves on the various measures of social equity. Generally, WalkUPs that are on the outer reaches of the commuter rail are affordable to live in but do not provide much work or school opportunity, and have little access to other higher opportunity areas. In contrast, WalkUPs near the Boston core benefit from the MBTA transit system, where residents can access many nearby WalkUPs quickly, but frequently have unaffordable housing costs. There is a clear tradeoff between accessibility/opportunity and housing affordability. Few WalkUPs provide both relatively affordable housing and good access to opportunities.

LAND USE DEFINED



The Rise of Walkable Urbanism

After decades of development in Edge Cities, the pendulum has swung back in favor of walkable urban development. Now the dominant development pattern in Metropolitan Boston—and many other metropolitan areas in the country—walkable urbanism is the driving force in real estate.

During the second half of the 20th century, the dominant development model was the familiar drivable sub-urban approach, whether regionally significant (Edge Cities) or local serving (Sub-divisions). Most real estate developers and investors, government regulators and financiers had come to understand this model extremely well, turning it into a successful development formula and economic and local government fiscal driver.

The best way of understanding this trend toward drivable sub-urbanism is to examine the relative market share of WalkUPs and Edge Cities. For example, although the Edge Cities housed only 23 percent of the region's office inventory in 1992, 43 percent of the region's new office development located in them from 1992-2000, meaning they were gaining market share. WalkUP office space, which made up 49 percent of the region's office inventory in 1992, garnered only 17 percent of the region's new office development over the same period, a loss of market share. This pattern of Edge City market share gain at WalkUPs expense was likely just a continuation of a trend that had begun in the 1950s and that was typical of most office markets across the nation.

However, starting in the 2001-2008 real estate cycle, the pendulum began slowly moving back towards the market demanding walkable urban development. Across the country in selective metros and in Boston, downtowns began to revitalize, inner-ring Suburban Town Centers redeveloped, and Inner Core Walkable Neighborhoods saw substantial reinvestment.

Starting in the 2000s real estate cycle (2001-2008) in Metro Boston, and accelerating in the current real estate cycle (2009-present), there has been a shift

towards walkable urbanism in most, though not all, product types. George Washington University's previous research on metropolitan Washington, D.C. and metropolitan Atlanta found a similar shift in market share in regionally significant income property development (for-sale housing was not studied).

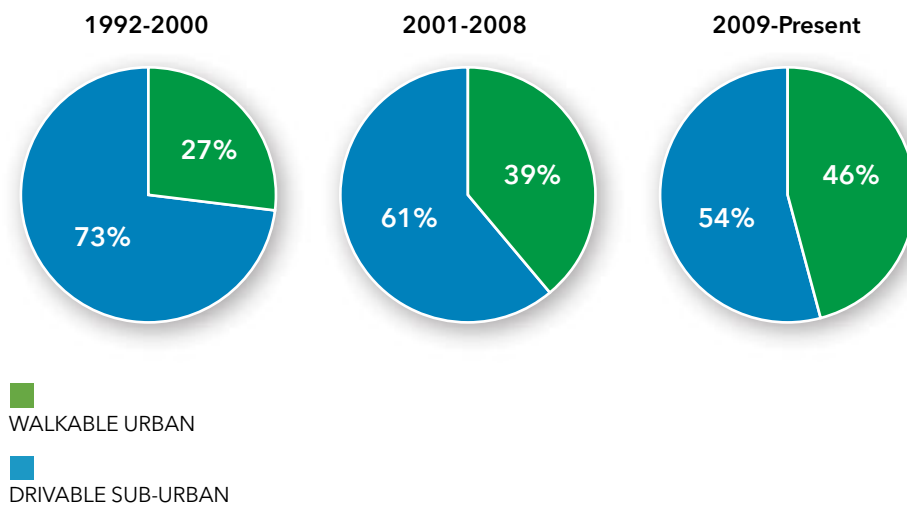
From 2009 to the present, 48 percent of metro Washington's income property development occurred in WalkUPs (0.9 percent of the land in the region), as compared to only 24 percent from 1992-2000. Even in metro Atlanta, which for many is the poster child of sprawl, 50 percent of income property development

since 2009 has occurred in WalkUPs (one percent of the land in the region), as compared to only 10 percent in the 1990s real estate cycle.

The increasing Boston regional market share for walkable urbanism has also been accompanied by rising rents and valuation premiums over the drivable sub-urban counterparts. These premiums now occur for all product types that we evaluated. Until more walkable urbanism emerges, the premiums will likely persist. This situation benefits walkable urban property owners but raises critical issues of affordability, a topic discussed in the social equity section of this report.

Share of Income Property During the Last Three Real Estate Cycles

Income Property = Office, Retail, Hotel, and Multifamily Apartments

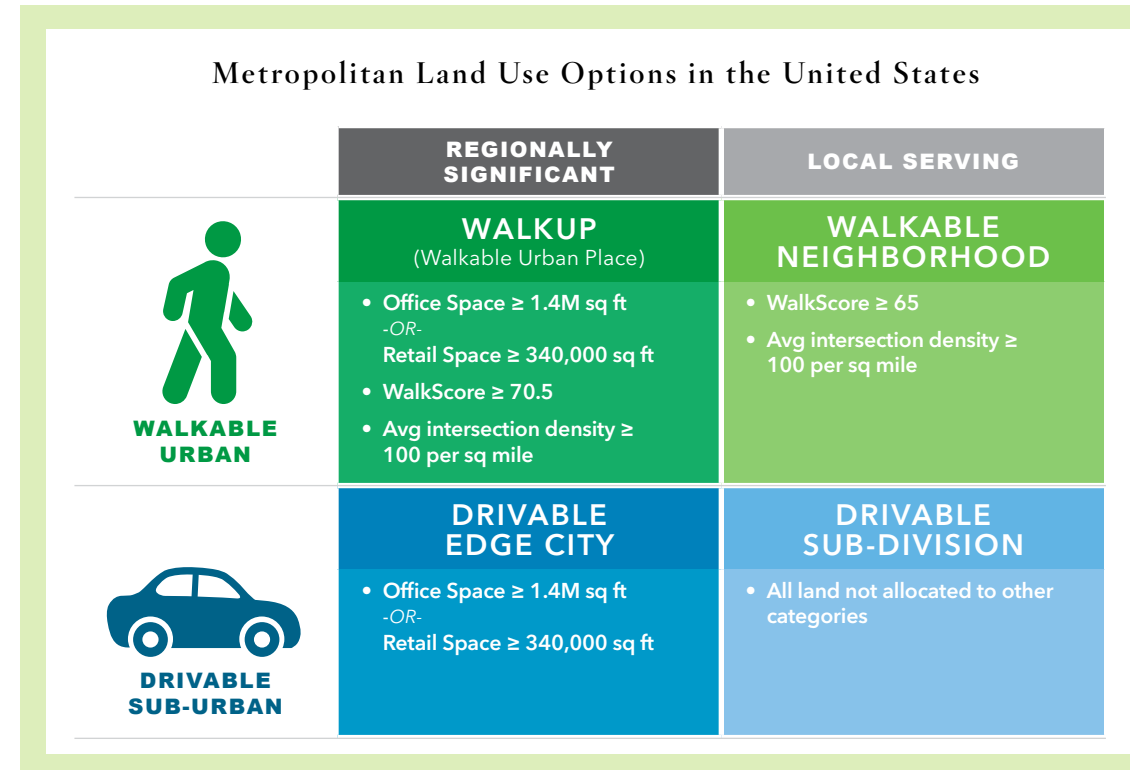


Form Meets Function

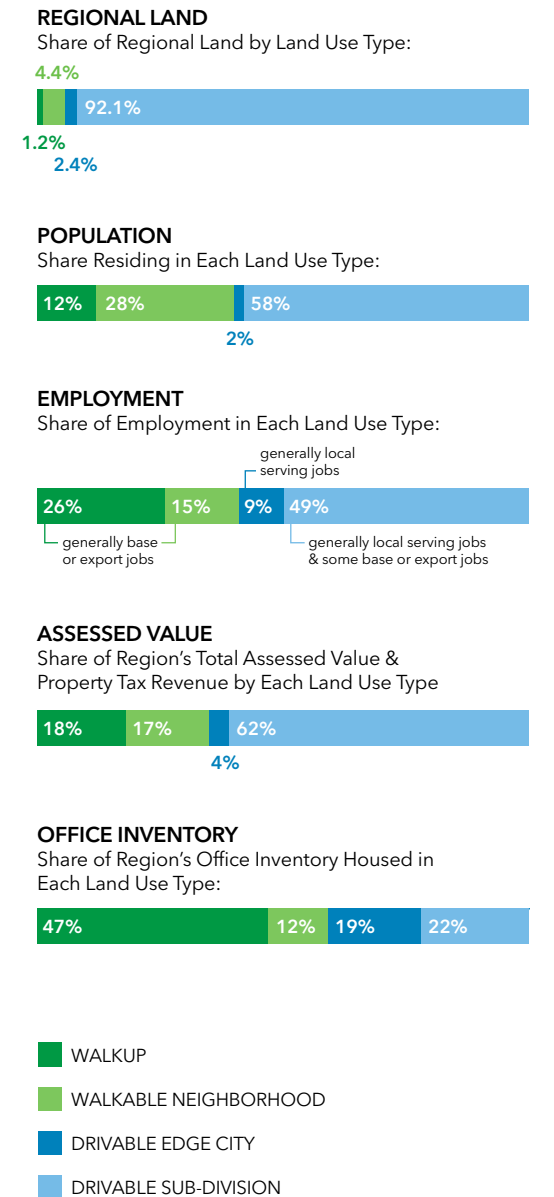
Two potential economic functions and two land use forms yield a four-cell matrix that categorizes 100 percent of metropolitan land.

In metropolitan areas, the economic use of land is categorized as either *regionally significant* or *local serving*. Regionally significant places have concentrations of employment (base, or export, jobs and regional serving employment), civic centers, institutions of higher education, major medical centers and regional retail, as well as cultural, entertainment and sports assets. Local-serving places are bedroom communities dominated by residential development that is complemented by local serving commercial and civic uses, such as primary and secondary schools, police and fire stations, and so on. Generally speaking, regionally significant places are where the metropolitan area earns its living while local serving places are where people spend their non-work lives.

When form meets function, a simple matrix emerges that shows how 100 percent of a metropolitan area's land is used.



Key Metrics by Land Use



Methodology

The methodology employed in this report has its basis in research described in the Brookings Institution report, *Walk This Way*,³ and used in two prior *WalkUP Wake-Up Call* reports by the GW School of Business focused on Washington, D.C.⁴ and Atlanta.⁵

The Boston research team reviewed and compiled data from CoStar, Cushman and Wakefield, and parcel data provided by MAPC to make preliminary identifications of major commercial concentrations. These commercial concentrations were initially separated into walkable and drivable by using Walk Score. MAPC provided average Walk Scores by census block, which had been averaged from sample points provided by Walk Score. Those census blocks within the commercial concentrations with average Walk Scores over 70.5, the threshold established in the *Walk This Way* report, were selected for further study as WalkUPs. Those commercial concentrations with Walk Scores below 70.5 were considered for analysis as Edge Cities or Emerging WalkUPs.

For each WalkUP candidate, boundaries were refined based on a review of aerial photographs, established or commonly held neighborhood boundaries or place-management districts and input from local residents and real estate professionals. Ultimately the boundaries were finalized by the experienced judgment of our team, which included professionals from MAPC, Northeastern University's Dukakis Center and the Center for Real Estate and Urban Analysis at George Washington University School of Business. In addition, boundaries were drawn with the recognition that a single walkable place tends not to exceed 600 acres, based upon experience and the limitations people are willing to walk, generally agreed to be between 1500 and 3000 feet.

In each case, the WalkUPs are made up of whole census blocks. We made the decision to use census blocks as the most basic components of each defined geography to facilitate the data aggregation process.

After boundaries were established, average Walk Scores and intersection densities for each WalkUP candidate were calculated, and data on the commercial real estate inventory was aggregated from CoStar. Average Walk Scores for each WalkUP represent the weighted average Walk Score of each census block within the WalkUP, weighted by the land area of each census block. The average intersection density is derived from EPA's Smart Location Database, which provides estimates of the intersection density per square mile by census block group, excluding those intersections that are primarily for exclusive automobile-use, such as Interstate on and off ramps, etc.

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

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

Candidates that did not meet the criteria were reclassified as Edge Cities, emerging WalkUPs or local-serving neighborhoods. For emerging WalkUPs, the minimum Walk Score criteria was reduced to 65, the intersection density per acre threshold reduced to 85, and the space requirements reduced to 90 percent of the established number, e.g. 1,260,000 square feet of office or 306,000 square feet of retail.

Edge Cities or regionally significant drivable locations were identified as places that had a minimum of either 1.4 million square feet of office or 340,000 square feet of retail but did not meet walkability criteria for Established or Emerging WalkUPs. Boundaries were drawn based on a review of CoStar data and aerial photographs for commercial concentrations.

Walkable Neighborhoods were identified as those census blocks with average Walk Scores of at least 65 and intersection densities of at least 100 per square mile within a quarter mile of the center of the census block.

ECONOMIC RANKINGS: METHODOLOGY & SOURCES

Building-level rent information was aggregated to the defined geographies to generate the analysis of rent premiums. For the office rent premium and inventory analysis we used a combination of data from Cushman and Wakefield and CoStar. In general, where Cushman and Wakefield data for a particular building was available, it was used. When not, the CoStar data was substituted. All office rents represent the weighted average, full-service asking rent per square foot. Averages were weighted according to square feet, e.g. large buildings influenced the average more than small buildings.

For rent and square footage information of the remaining income property categories, including retail, multifamily apartments, and hotels, we relied on CoStar and STR. In a few cases, no rent data was available for any buildings within a WalkUP geography. In those cases, rents per square foot were estimated based on the correlation between the

average assessed value per square foot and average rents in geographies where rent information was available.

For purposes of the economic rankings, for-sale housing prices were converted into annual rents per square foot by estimating the annual mortgage payment, assuming a 30-year fixed mortgage at a four percent interest rate, adding the property tax associated with each jurisdiction, and a homeowners' insurance premium of \$.50 per square foot.

Estimates of market value premiums for walkable urban places, as described on page 24, are based on the average rents per square foot for each product type as determined above, and cap rates, which we estimated based on transaction data provided by Cushman and Wakefield. In each case, we assumed that expenses as a percentage of rent revenue were constant across both walkable urban places and drivable locations. The average rent, less the assumed expense ratio, divided by the average cap rate, determined the valuation estimates. The estimates of value premiums were compared to actual differences in per-square-foot transaction prices between walkable urban places and drivable locations to ensure they were reasonable. To be clear, these estimates represent averages based on sample data—individual transaction values may deviate significantly from these estimates.

Assessed value estimates and the estimate of the total square footage in each geography are based on the Massachusetts Land Parcel Database, a state-level database that aggregates and attempts to harmonize property assessment data from all the various towns in Massachusetts. This dataset has

some limitations. Different towns do not always have consistent standards for measuring square footage and classifying land use. In addition, the dataset is not entirely current—a few towns have only provided data through 2009, while others are current through 2014. Nonetheless, it is the most comprehensive source available for assessed values and residential square footage.

SOCIAL EQUITY RANKINGS: METHODOLOGY & SOURCES

The following data sources were used to calculate the social equity metrics.

- **Percentage of the region's working-age population accessible by transit:** EPA Smart Location Database
- **Non-Car Commute Share:** American Community Survey 2007-2011
- **Housing and Transportation Costs:** The Department of Housing and Urban Development's Location Affordability Portal. <http://www.location-affordability.info/>
- **School Proficiency:** Massachusetts data on average reading proficiency by school, for elementary schools and middle schools. Each census block was assigned the average proficiency of the three nearest schools. Scores for all geographies are based on the average of all census blocks in the geography weighted by each block's population. <http://www.doe.mass.edu/infoservices/reports/>
- **Housing Cost Burdens:** The Department of Housing and Urban Development

Note that we considered using a variety of additional measures in the social equity rankings, such as accessibility to and from each geography by automobile, the percentage of housing that is subsidized, and the local unemployment rate, among others. For the most part, these variables were found to be highly correlated with the variables listed above, such that they did not meaningfully change the results.

The Five Types of WalkUPs in Boston

There are seven possible types of regionally significant WalkUPs in any metropolitan area. Metro Boston has only five of these WalkUP types.

Based on previous analyses of other metropolitan areas, there are seven types of possible WalkUPs in a metropolitan area: Downtown, Downtown Adjacent, Urban Commercial, Urban University, Regional Urban Centers (referred to as Suburban Town Center in previous studies), Redeveloped Drivable Commercial, and Greenfield/Brownfield. Each of these WalkUP types has a different history, product mix, and transportation infrastructure, though all are trending toward mixed-use, high-density walkable urban places.



In Metro Boston, there are no established Redeveloped Drivable Sub-urban Commercial or Greenfield/Brownfield developments, though the metro area will soon have one. Assembly Square, located at the Somerville site of a former Ford assembly plant, is now classified as emerging, but will quickly move into the ranks of the established as it is built out.



There is also a sub-class of WalkUPs that is important for future development, known as Innovation Districts. These knowledge-economy, high-tech, maker- and software-focused WalkUPs often co-locate around universities. As defined by Bruce Katz and Jennifer Wagner of the Brookings Institution, these are “geographic areas where leading-edge anchor institutions and companies cluster and connect with startups, business incubators, and accelerators. They are also physically compact, transit-accessible, and technically-wired and offer mixed-use housing, office, and retail.”⁶ The best example in the metro area is Kendall Square/MIT, one of the most important models in the country of an Urban University-based Innovation District. Another Innovation District is the Seaport, a Downtown Adjacent WalkUP east of Downtown Boston.



1 Downtown

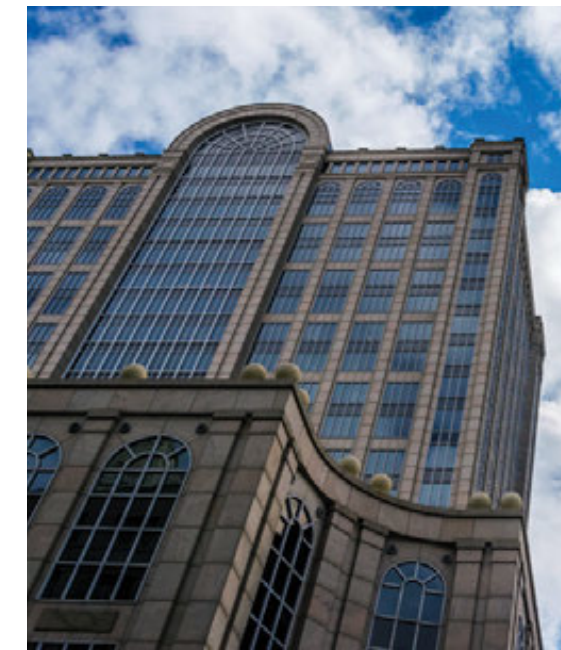
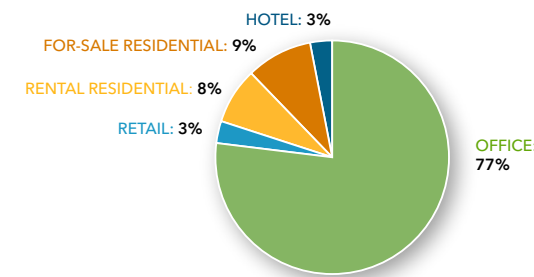
Examples: *Downtown BID, Financial District*

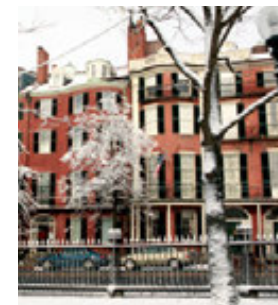
Downtowns are the original section of a metro area’s principal city. In Boston, the Downtown Business Improvement District and the Financial District are combined to form the Downtown in the region as defined by this research.

As is typical of Downtowns, office space is the dominant use, though for-sale and rental residential are the fastest growing uses in recent years and are expected to continue to expand.



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





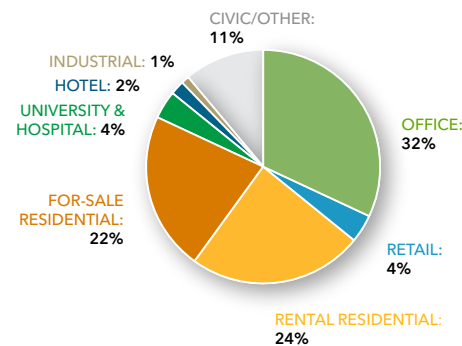
2 Downtown Adjacent

Examples: Back Bay, Beacon Hill, Chinatown, North End, Seaport, South End, West End

Immediately adjacent to Downtown Boston, these WalkUPs usually have a lower density than Downtown and possess a unique character from Downtown and from one another. They have a more balanced mix of space than Downtown, with almost equal portions of residential and office/retail space. The result is usually a lively, 24-hour environment.



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



3 Urban Commercial

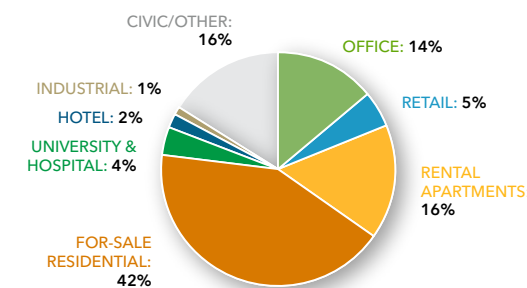
Examples: Allston, Cambridgeport, Central Cambridge, Charlestown, Coolidge Corner, Dudley Square, East Cambridge, Fields Corner, Kenmore/Fenway, Mission Hill, North Dorchester, North New Bedford/Acusbnnet Ave., Porter Square/Davis Square, Roxbury, South Boston

Historically local-serving neighborhood commercial, Urban Commercial WalkUPs generally declined economically after World War II but, in recent years, they have found a new economic role.

Urban Commercial WalkUPs in Metro Boston are dominated by residential real estate (58 percent) and are marked by more retail and less office space than Downtown or Downtown Adjacent places. The retail in Urban Commercial WalkUPs is generally characterized as urban entertainment, such as restaurants and nightclubs, but also, including boutique shops, and furniture and home décor stores.



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





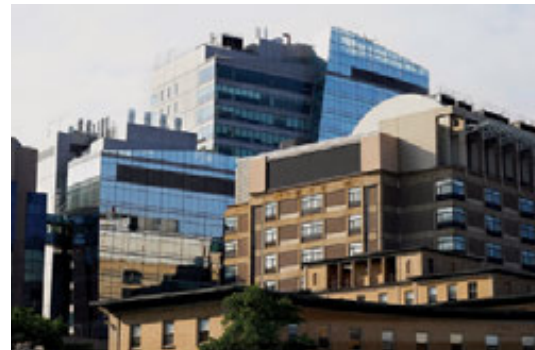
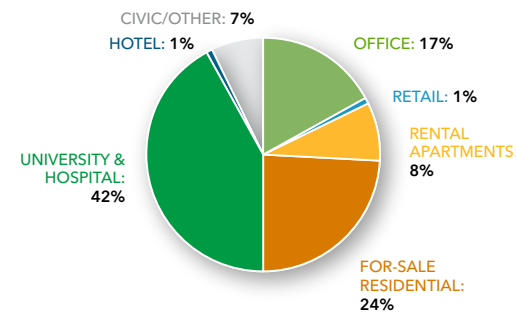
4 Urban University

Examples: Harvard Square, Longwood Medical Area, Lower Allston, MIT/Kendall Square, Northeastern, Tufts

In these WalkUPs, universities and other institutional owners, such as medical facilities or government research centers, are the dominant landowners. These landowners gauge the “success” of their development not in terms of rent they may be able to collect, but in their ability to attract talent (professors, students, administrators, etc.).

The presence of these anchor institutions can also present opportunities for Innovation Districts to develop. As mentioned above, MIT/Kendall Square is one of the country’s leading examples of an Innovation District. University space (classrooms, laboratories, hospitals, general office, and dorms) is the largest use, followed by off-campus housing, both rental and for-sale. Office space represents 17 percent, showing the commercialization of university research and desire to be near the university campus. Retail is very small (one percent), which is an opportunity; only Harvard Square has created a critical mass of retail in this type of WalkUP.

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



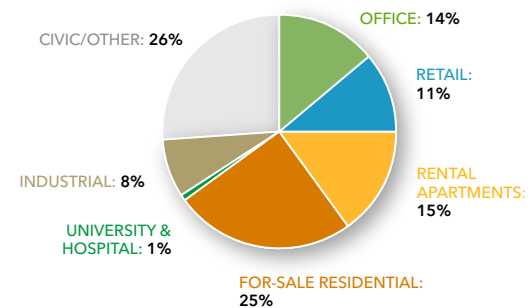
5 Regional Urban Center

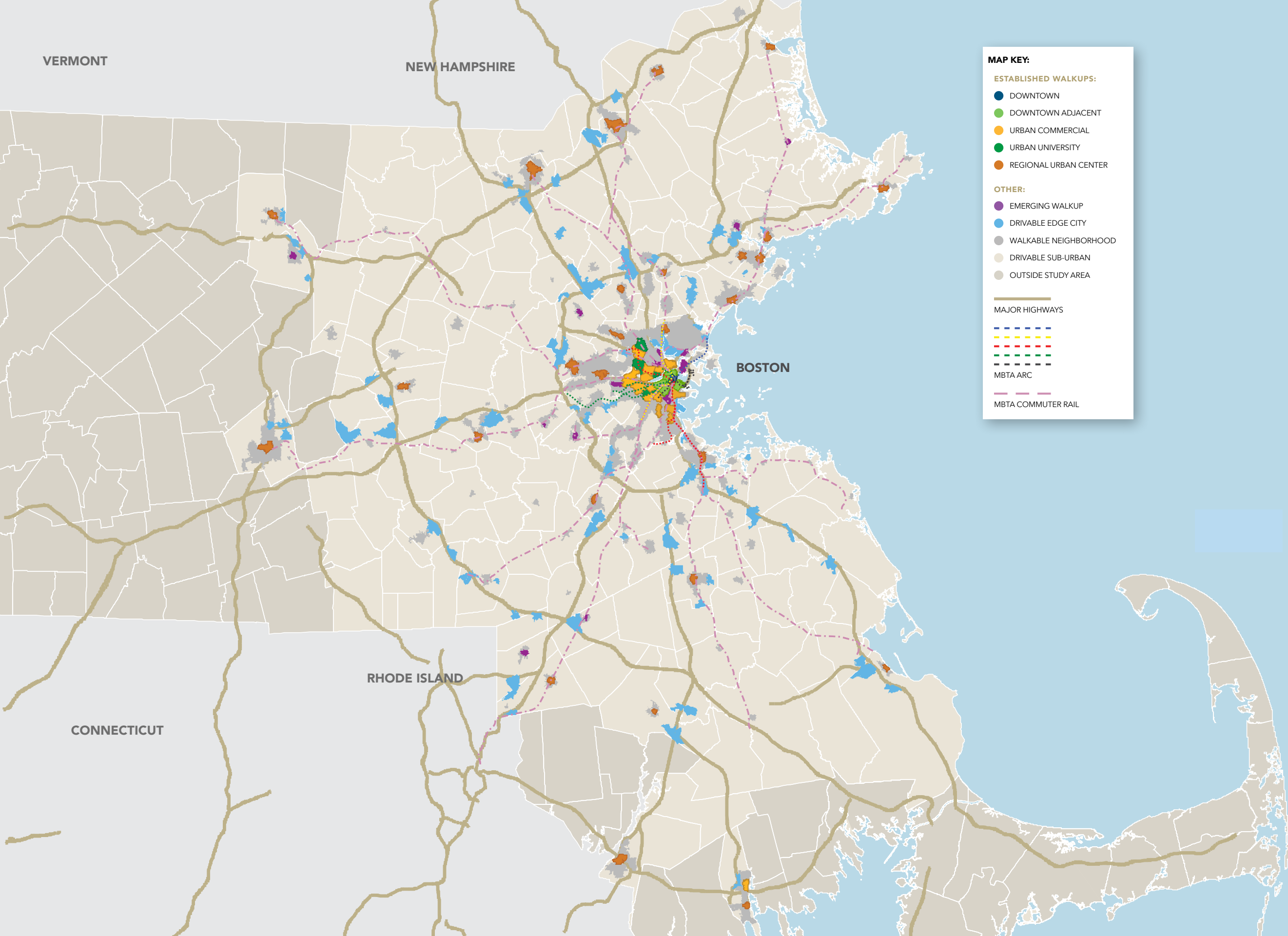
Examples: Arlington, Attleboro, Brockton, Downtown Beverly, Downtown Fall River, Downtown Gloucester, Downtown New Bedford, Downtown Peabody, Downtown Quincy, Downtown Salem, Downtown Worcester, Framingham, Haverhill, Lawrence, Lowell, Lynn/Central Square, Malden Center, Marlborough, Newburyport, Norwood, Plymouth, Taunton BID, Wakefield, Waltham, Watertown, Woburn

Typical Regional Urban Centers (referred to as Suburban Town Centers in previous reports) are 18th- or 19th-century towns that were swept up in the sprawl of the metropolitan area after World War II. Laid out before the automobile, they have a walkable urban grid and historical buildings that preserve the memory of the place from the more vibrant pre-World War II era. Following decades of decline, many have found a new economic role.

Regional Urban Centers have less office space than Downtown or Downtown Adjacent areas and relatively more retail as a percentage of the total space. Of all the WalkUPs, this is the only type to have any appreciable industrial space, though this is likely due to historical legacy more than anything. Increasingly, these are becoming growing concentrations of rental and for-sale residential, as well as the return of employment and retail. These WalkUPs are also concentrations of civic spaces.

Product Mix: **Regional Urban Center**
Average % of Total Square Footage





MAP KEY:

ESTABLISHED WALKUPS:

- DOWNTOWN
- DOWNTOWN ADJACENT
- URBAN COMMERCIAL
- URBAN UNIVERSITY
- REGIONAL URBAN CENTER

OTHER:

- EMERGING WALKUP
- DRIVABLE EDGE CITY
- WALKABLE NEIGHBORHOOD
- DRIVABLE SUB-URBAN
- OUTSIDE STUDY AREA

MAJOR HIGHWAYS

- Dotted blue line
- Dotted yellow line
- Dotted red line
- Dotted green line
- Dotted black line

MBTA ARC

MBTA COMMUTER RAIL

LAND USE IN METRO BOSTON

ID#	ESTABLISHED WALKUPS	ACRES
1	Allston	567.1
2	Arlington	246.3
3	Attleboro	206.3
4	Back Bay	468.6
5	Beacon Hill	195.6
6	Brockton	247.7
7	Cambridgeport	421.6
8	Central Cambridge	541.0
9	Charlestown	424.9
10	Chinatown	108.3
11	Coolidge Corner	691.0
12	Downtown Beverly	266.4
13	Downtown BID	95.1
14	Downtown Fall River	489.4
15	Downtown Gloucester	287.2
16	Downtown New Bedford	171.9
17	Downtown Peabody	214.8
18	Downtown Quincy	318.9
19	Downtown Salem	308.4
20	Downtown Worcester	518.2
21	Dudley Square	321.9
22	East Cambridge	275.7
23	Fields Corner	275.1
24	Financial District (Boston)	149.0
25	Fitchburg	290.4
26	Framingham	256.7
27	Harvard Square	676.6
28	Haverhill	286.4
29	Kenmore/Fenway	372.9
30	Lawrence	828.4

ID#	ESTABLISHED WALKUPS	ACRES
31	Longwood Medical Area	198.5
32	Lowell	689.5
33	Lower Allston	506.0
34	Lynn/Central Square	271.9
35	Malden Center	211.5
36	Marlborough	253.4
37	Mission Hill	323.1
38	MIT/Kendall Square	225.3
39	Newburyport	200.5
40	North Dorchester	396.1
41	North End	157.2
42	North New Bedford/ Acushnet Ave.	288.3
43	Northeastern	164.6
44	Norwood	193.7
45	Plymouth	123.4
46	Porter Square/Davis Square	600.2
47	Roxbury	335.9
48	Seaport	420.2
49	South Boston	469.0
50	South End	474.4
51	Taunton BID	95.5
52	Tufts	568.6
53	Wakefield	137.5
54	Waltham	600.6
55	Watertown	426.8
56	West End	157.8
57	Woburn	174.3

ID#	EMERGING WALKUPS	ACRES
58	Assembly Square	165.2
59	Brickbottom - Innerbelt	245.2
60	Brighton	298.6
61	Chelsea	194.2
62	Danvers	205.1
63	East Boston	492.3
64	Ipswich	143.2
65	Leominster	228.5
66	Lexington	188.8
67	Mansfield	115.0
68	Needham	193.8
69	Newmarket/Widett Circle	404.7
70	North Attleborough	215.6
71	Wellesley Square	77.2

MAP KEY:

ESTABLISHED WALKUPS:

- DOWNTOWN
- DOWNTOWN ADJACENT
- URBAN COMMERCIAL
- URBAN UNIVERSITY
- REGIONAL URBAN CENTER

OTHER:

- EMERGING WALKUP
- DRIVABLE EDGE CITY
- WALKABLE NEIGHBORHOOD
- DRIVABLE SUB-URBAN
- OUTSIDE STUDY AREA

MAJOR HIGHWAYS

- (Solid line)
- (Dashed line)
- (Dotted line)

MBTA ARC

- (Dashed line)

MBTA COMMUTER RAIL

- (Dashed line)

Where the WalkUPs Are

Metropolitan Boston's 57 WalkUPs are concentrated inside Route 128 and span 33 towns and cities.

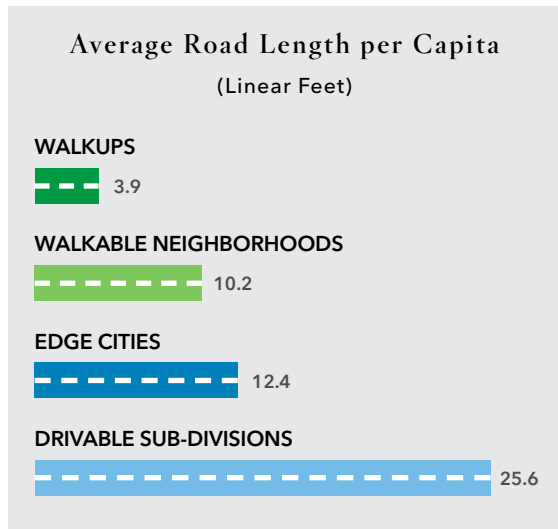
Geographic Findings

Metropolitan Boston has more WalkUPs than any other metro area in the U.S., due its large number of Regional Urban Center and Urban Commercial WalkUPs.

- **There are 57 Established WalkUPs in Metro Boston in 2015.** This equates to approximately one WalkUP per 88,000 people. Established WalkUPs range in size from 95 to 691 acres (average is 337 acres) and account for one percent of the total land area in Metro Boston.
- **In addition, there are 14 Emerging WalkUPs.** These are places that do not yet contain a critical mass of commercial square footage or walkability to qualify as established WalkUPs. They represent 0.2 percent of the regional land area. Many of these places are sufficiently walkable from a Walk Score ranking, but miss the space quantity thresholds. These include the walkable cores of Lexington, Leominster, and Needham. In addition, we identified several former industrial locations in the Inner Core that nearly meet the walkability and space criteria now and likely will in the future. For example, Assembly Row in Somerville is a new mixed-use development project in a former drivable location, which recently completed its first phase. Assembly Row does not quite have enough space to meet the thresholds for established WalkUPs but its second phase is about to break ground, which will qualify it as established.
- **Established WalkUPs are the densest of all the metropolitan development options, but they still leave substantial opportunity for infill development and redevelopment.** The established WalkUPs have an average gross floor-area-ratio (FAR) of .82 though it ranges widely, from .25 to 6.6. This suggests that substantial opportunities remain for infill development and/or redevelopment in nearly all WalkUPs, even in places perceived to be built out. For comparison, the average FARs of Edge Cities in Metro Boston is 0.14; meaning WalkUPs are

nearly six times denser. Walkable Neighborhoods have a 0.33 FAR and are eight times denser than Drivable Sub-divisions, which have a 0.04 FAR.

- **Twenty-six percent of the metropolitan area's jobs are located in WalkUPs and nine percent of are located in Edge Cities.** Given that approximately two-thirds of the entire region's office inventory and 30 percent of the industrial is located in these regionally significant places, it is likely that a majority of the region's base, or export, jobs, are located in them, using only 3.6 percent of the region's land. In other words, the metropolitan area earns the bulk of its living in a small percentage of its land mass. WalkUPs have the highest job density, an average of 33.6 jobs per acre, compared to only five jobs per acre for Edge Cities, four for Walkable Neighborhoods, and 0.9 for Drivable Sub-divisions.
- **Seventy-five percent of established WalkUPs are served by rail transit.** The percentage rises to nearly 100 percent for the WalkUPs ranked highly for economic performance, underscoring the importance of transit service to successful urbanism. Nonetheless, as the one-quarter of Boston WalkUPs lacking transit demonstrate, rail transit is not essential. Assuming a regional desire for more economic growth, WalkUPs not served by transit today make the most logical locations for future transit stations when the system expands to insure built-in ridership and promotion of that growth.
- **Residents and employees of WalkUPs and Walkable Neighborhoods likely get more physical activity.**⁷ The established WalkUPs have an average of 186 intersections per square mile, followed by 118 for the Walkable Neighborhoods, drop-



ping to 33 for Edge Cities, and 22 for Drivable Sub-divisions. Previous studies have shown that intersection density is one of the strongest predictors of walking and reduced driving, even more so than population density, distance to transit, and other factors.⁸ Intersection density positively correlates with the amount of physical activity, controlling for gender, age, and education.⁹

- **The average length of road per capita, which is a proxy for infrastructure elements such as water and sewer lines, electric power, broadband, and most other infrastructure categories, is three times more for drivable development versus walkable development.** Although established WalkUPs have more road length on a per acre basis than the other metropolitan development options, on a per capita basis (residents and employees), WalkUPs have lower road length, therefore less overall infrastructure costs per capita. On a per capita basis, Metro Boston's Edge Cities require 3.2 times more road length than WalkUPs.¹⁰ Drivable Sub-divisions require 2.6 times the road length of Walkable Neighborhoods.

Product Findings

For the first time ever, the size and share of all real estate products in Metropolitan Boston has been tabulated.

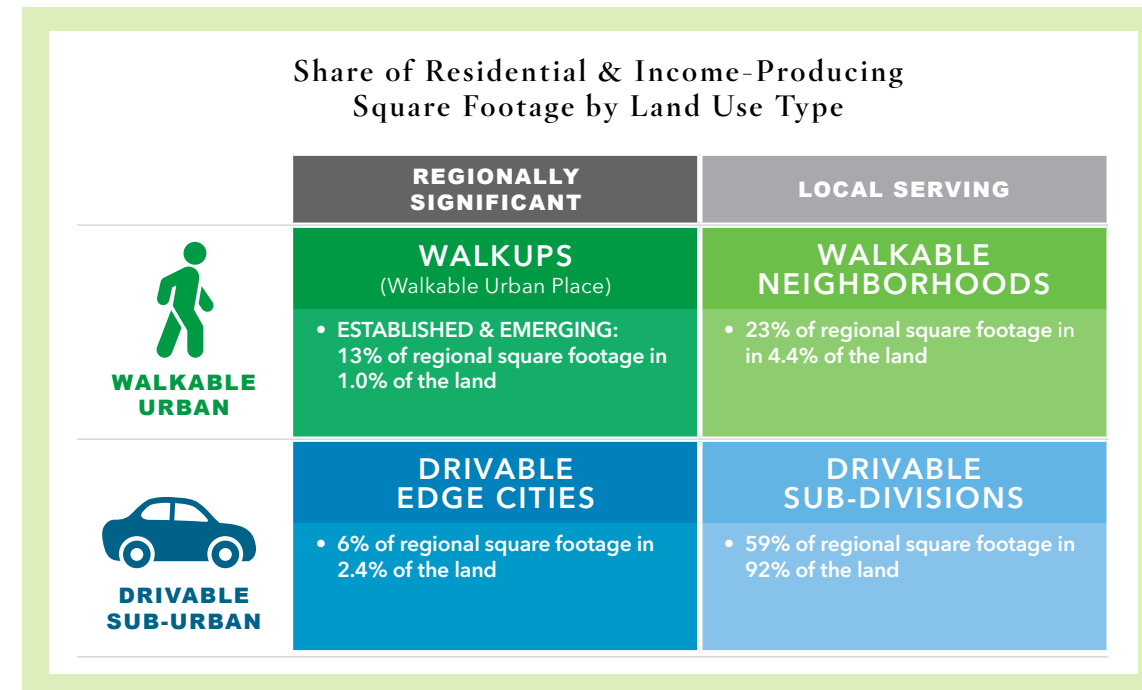
BY LAND USE OPTION

The 3,119 square miles that comprise Metropolitan Boston contain approximately 5.5 billion square feet of built square footage. Approximately 3.5 billion (63.6 percent) of this total square footage is for-sale housing: homes, two- and three- family homes, townhouses, and condominiums. About six to 12 percent of this for-sale housing is actually rented.

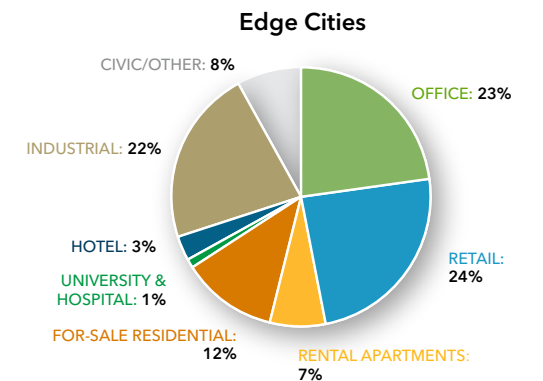
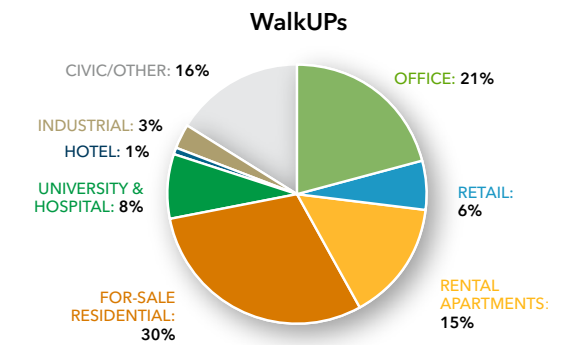
The remaining two billion square feet is either income-producing real estate—office, retail, rental apartments, industrial, flex space, hospitality, and health care—or owner-occupied properties, such as government buildings, universities, schools, and churches.

Metro Boston's 5.5 billion square feet of real estate breaks down into the following product types:¹¹

Product Type	Sq Ft	% of Total
FOR-SALE RESIDENTIAL	3,440 MM	63%
RENTAL APARTMENTS	293 MM	5%
OFFICE	326 MM	6%
RETAIL	222 MM	4%
INDUSTRIAL	283 MM	5%
HOTEL	40 MM	1%
CIVIC/INSTITUTIONAL/OTHER ¹²	890 MM	16%
TOTAL	5,494 MM	100%



Share of Square Footage of Metropolitan Property Types in WalkUPs vs. Edge Cities



The product mix of WalkUPs and Edge Cities is substantially different. For Edge Cities, the three dominant property types are retail, office, and industrial. Together, they account for 69 percent of the total square footage. For WalkUPs, residential, office, and civic/institutional space are the major property types. Edge Cities tend to be where people go to shop and work. WalkUPs tend to be where people live, work, shop, attend university, and engage in civic activities.

PRODUCT TYPE VALUATION PREMIUMS

The data in Metro Boston indicate a substantial shift in new product delivery towards walkable urban development over the past three real estate cycles. WalkUPs, especially those in the Inner Core of the metro area, are also showing strong and growing rent and for-sale price premiums over drivable sub-urban locations, both Edge Cities and Sub-divisions. These premiums exist for all product types studied: office, retail, rental apartments, and for-sale residential. Walkable Neighborhoods seem to enjoy slight premiums for residential space over Sub-divisions, particularly when comparing areas of similar median income. But so far no premium has materialized for office or retail located in Walkable Neighborhoods.

Increasing rent premiums also have social equity implications, since they correspond to declining affordability for low- and moderate-income households who are already living in WalkUPs (or who would like to move there.)

OFFICE

- **WalkUP office rents average \$39.55 per square foot, which is 78 percent higher than Edge Cities average of \$22.34.** In 2001, the gap between WalkUPs and Edge Cities was already large—at approximately 61 percent—but clearly, it has grown.
- The office market preference for WalkUPs is also demonstrated by prevailing capitalization rates, known as “cap rates” in the real estate industry. Cap rates are a means of valuing an annual stream of income from a real estate asset.¹³ It is important to note that due to the mathematical method of the calculation of cap rates, a lower cap rate indicates higher valuation. Based on an analysis

of data provided by Cushman and Wakefield, the average office cap rate in WalkUPs was 4.6 percent, versus 6.5 percent for offices in Edge Cities, a 41 percent WalkUP cap rate premium.¹⁴ **By combining both the rent and the cap rate premiums, the value premium for office space in WalkUPs is 150 percent over Edge Cities.** Due to a widening spread in cap rates between WalkUPs and Edge Cities, as well as stronger rent growth in WalkUPs, this valuation premium has grown since 2007, when it was 100 percent.¹⁵

- **Office rents in Walkable Neighborhoods at \$18.59 per square foot are actually three percent lower than in Drivable Sub-divisions.** There is currently no value premium for offices located in Walkable Neighborhoods as compared to Drivable Sub-divisions. Office rents in these local-serving locations tends to be among the lowest in the metro area due to the tenants served.

RETAIL

- **Retail rents in WalkUPs are approximately 23 percent higher than in Edge Cities, up from near parity in 2007.** Based on an analysis of data provided by Cushman and Wakefield, we estimate that average cap rates in WalkUPs are 4.3 percent versus 6.5 percent for Edge Cities and Sub-divisions. **The combination of lower cap rates and higher rents in WalkUPs translates into a total value premium of 85 percent over Edge Cities.**
- **Retail rents in Walkable Neighborhoods average \$17.44, very similar to the average for Drivable Sub-divisions.** We did not have sufficient data to estimate cap rates for Walkable Neighborhoods but they are likely to be similar to drivable areas. The result is that retail values in Walkable Neighborhoods and Drivable Sub-divisions are about equal.

RENTAL APARTMENTS

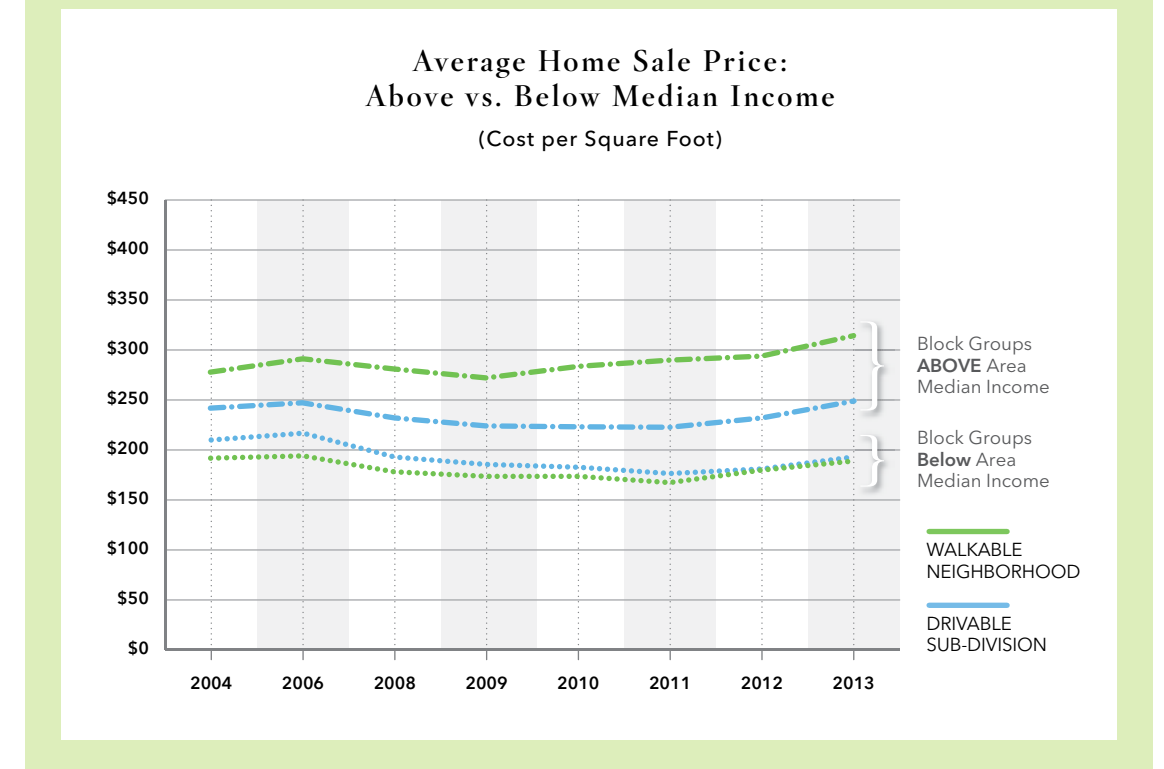
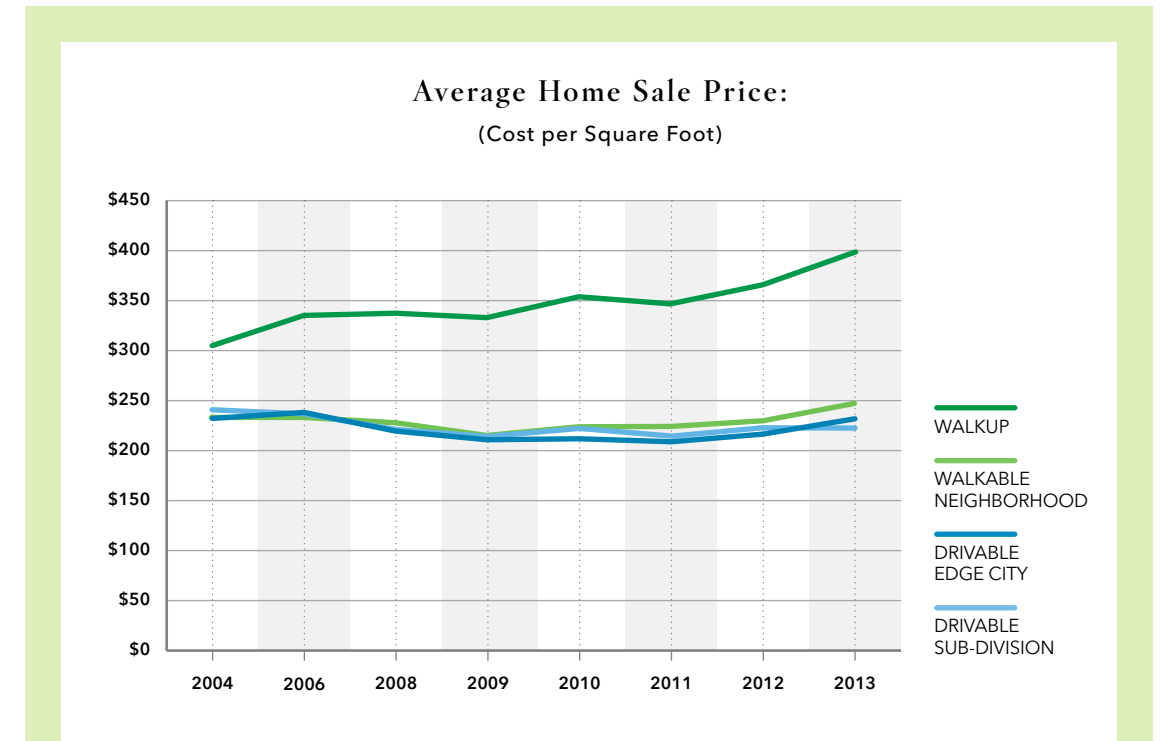
- **Average rental apartment rents per square foot are 52 percent higher in WalkUPs than in Edge Cities.** Based on data provided by Cushman and Wakefield, we estimate that the average cap rate for WalkUP apartments is 4.5 percent versus 5.3 percent for Edge Cities and Sub-divisions. Combining this cap rate premium and the higher rents results in an overall value premium of 78 percent for apartments in WalkUPs relative to Edge Cities.
- **Average monthly apartment rents in Walkable Neighborhoods are estimated to be \$1.85 per square foot, slightly higher than the \$1.72 for Drivable Sub-divisions.** The data was insufficient to determine any difference in cap rates between Walkable Neighborhoods and Drivable Sub-divisions and we suspect that there is little difference at this time. As a result, multifamily rental apartments in Walkable Neighborhoods have likely only a small value premium of approximately eight percent over those in Drivable Sub-divisions.

HOTELS

- **For hotels, the average REVPAR (revenue per available room) in WalkUPs is 81 percent higher than in Edge Cities,** with the caveat that this estimate is based on a limited sample of hotels in a few selected WalkUPs and Edge Cities where data was available. Specific cap rate data was unavailable but the spread between Central Business District and Suburban hotels is probably indicative of the difference between WalkUPs and Edge Cities. It ranges from 0.75 percent for “select service” hotels to 2.5 percent for “full-service” hotels.¹⁶ If we assume an average cap rate premium of 1.5 percent for WalkUPs, the total WalkUP value premium is 120 percent.¹⁷

FOR-SALE RESIDENTIAL

- **The trend in for-sale housing prices has been remarkable.** Home prices in WalkUPs, and to a lesser extent, Walkable Neighborhoods, weathered the recession much better than Edge Cities and Sub-divisions. As of 2013, the latest year data was available, per square foot home prices in Edge Cities and WalkUPs had recovered from the recession to the point where they were about the same as they were in 2004, in nominal dollars. In WalkUPs, however, home prices in 2013 were 31 percent higher than in 2004. **This has resulted in a price per square foot premium of 80 percent for WalkUPs over Edge Cities.**¹⁸
- **Prices in Walkable Neighborhoods tracked Drivable Sub-divisions very closely until 2010, when a slight premium emerged. As of 2013, per square foot home prices in Walkable Neighborhoods were seven percent higher than in Drivable Sub-divisions.** However, if neighborhoods of similar incomes are compared, the premium becomes more apparent. Looking only at lower income places (block groups where the median income is below the regional median of \$79,000), the average price per square foot in Walkable Neighborhoods in 2004 was 10 percent lower than Drivable Sub-divisions. By 2013, that discount had melted to virtually nothing because prices in lower income Walkable Neighborhoods rose faster than in Drivable Sub-divisions, (although prices for both are still off their peak of 2006). Comparing neighborhoods with median incomes higher than \$79,000 shows a similar trend although the starting point is different. Higher-income Walkable Neighborhoods started with a 15 percent premium over Drivable Sub-divisions in 2004 and this premium grew to 26 percent by 2013.





WALKUP TRENDS

Market Shifts Over Three Real Estate Cycles

The market shifts of the past 30 years demonstrate a general trend toward walkable urban development, although each product type is different. Some are leading the trend toward more walkable urban development, some are laggards, and some are in between.

The late 20th century saw walkable urban real estate product types lose market share as drivable sub-urban development was in ascent. For example, during this period walkable urban office absorption in nearly every metropolitan area would have had to double just to maintain market share. These declining market shares reflected the nationwide disinvestment in American center cities—the locations of most walkable urban places in the 20th century.

The last 30 years, however, have seen a shift back toward walkable urban development. In Metro Boston, there are three categories of real estate products relevant to this walkable urban trend.

1 LEADERS: HOTEL & OFFICE

- Both products have increased their market share in the most recent real estate cycles.
- Hotel** is the product in Metro Boston that has shifted most aggressively to walkable urban development. Of the hotel inventory located in regionally significant places in 1991, 46 percent was in WalkUPs, 54 percent was in Edge Cities. During the 1990s cycle, Edge City hotels expanded their market share (61 percent of the new hotel growth in the cycle) over WalkUPs. In the 2000s cycle the trend lines reversed with WalkUP hotel absorption being three times that of Edge City hotel absorption. During the current cycle that started in 2009, the WalkUP hotel market has grown even faster, at 4.5 times the rate of Edge Cities.

- Office** is also a leading walkable urban product. In the 1990s cycle, WalkUP office absorption would have had to double just to maintain market share. In both the 2000s and the current cycle, office absorption has been evenly split between WalkUPs and Edge Cities. The high valuation premium for office space in WalkUPs, 150 percent over Edge Cities, demonstrates the pent-up demand for more walkable urban office space.

2 TRANSITIONAL: RENTAL APARTMENTS

- Rental Apartments** is the product type that seems to be in transition from drivable to walkable urban. From 1992-2000, 50 percent of new apartment development was located in either WalkUPs or Walkable Neighborhoods. From 2001-2008, walkable areas' share fell to 41 percent but since 2009, it has risen once again to 50 percent. We anticipate that walkable Boston will continue to grow its market share of new apartment development in the next cycle, and establish a clearer trend. It is significant that for the first time in decades, multi-family permits (both for-sale and rental since this data has always been combined) are now greater than for-sale residential in this cycle. This may be a reflection of homeownership rapidly dropping. It fell from 69 percent of total households in 2005 to 64 percent in 2014 and shows no signs of leveling off. Households in well-known walkable urban places, such as Manhattan, Paris and London, have a much higher propensity to rent; generally 60-70 percent are renters. Possibly there is a structural shift toward rental

apartments as Metro Boston builds more walkable urban places, a hypothesis that should be studied in the future. MAPC projections through 2040 indicates increased rental apartment demand.¹⁹

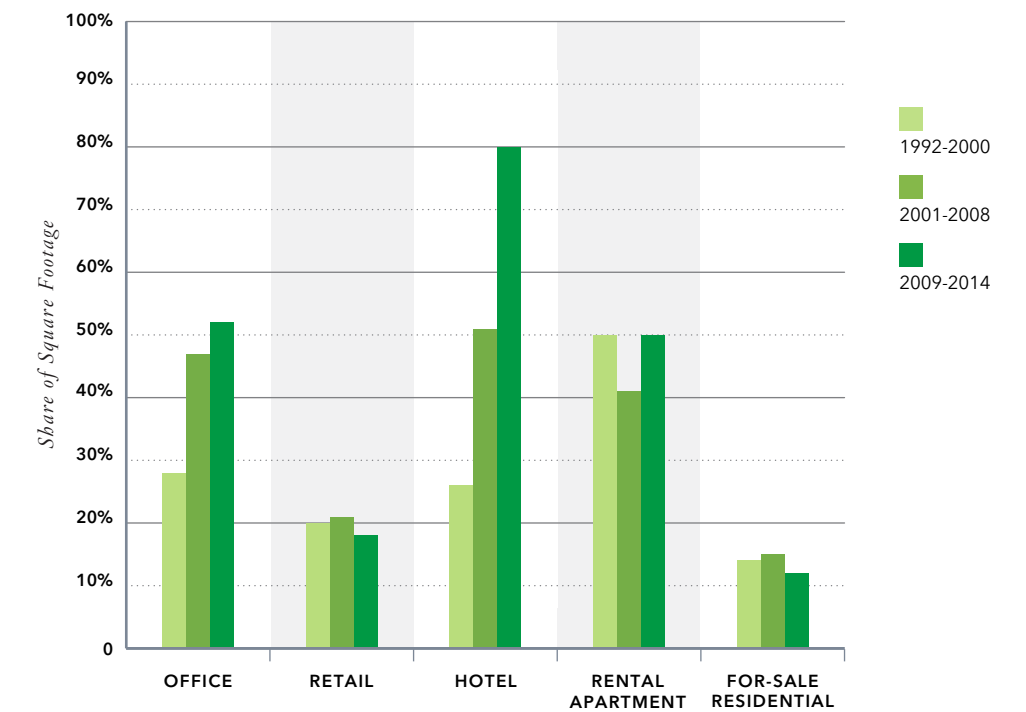
3 LAGGARDS: RETAIL & FOR-SALE RESIDENTIAL

- The lagging product types that continue to absorb more drivable sub-urban development include **Retail** and **For-Sale Residential**. Both types of product developers continue to embrace the drivable sub-urban model of the last century that requires the extensive consumption of land for sub-divisions and one-story shopping centers surrounded by acres of surface parking. This lag may be due to the valuation premiums, that while significant (41 percent for retail and 20 percent for for-sale residential, as mentioned above), are not sufficient for some developers to change their business model.
- The issue is that business as usual may no longer be viable in the future, particularly for homebuilders. In 2014, the fifth year of this cycle and possibly at its peak, slightly less than 5,000 single-family for-sale permits were issued in the Boston metro area. Although this represents a recovery from all-time low levels of 2008 and 2009, it is still lower than the permit issuance in any year from 1980-2007. This possible peak year for permits in this cycle is even lower than the recessionary low in 1989. In the most recent cycle, single-family units have accounted for a minority of housing permits, 47 percent, versus 53 percent for multi-family. This may become the first real estate cycle

since at least 1980, when this data first became available, where multifamily permits outnumbered single-family. Compare that to 1992-2000, when single-family units accounted for 84 percent of permits. There are many factors affecting the homebuilding industry's weak recovery. However, given the huge and growing price premiums in walkable places and stagnant prices in drivable locations, one hypothesis is that homebuilders are simply not building the right products in the right places that are attractive to a large and growing portion of the market.

The Last Three Real Estate Cycles:
Share of Metro Income Property Square Footage Developed in WalkUPs & Walkable Neighborhoods²⁰

Income Property = Office, Retail, Hotel, Rental Apartment, For-Sale Residential



Walkable Urbanism & Economic Development

Correlations and findings indicate that across the largest 30 U.S. metropolitan areas, walkable urban development, education, and economic vitality are linked...somehow. This correlation appears to be true for Boston.

The hypothesis many economic development professionals and many business people subscribe to is that the U.S. has been layering a "knowledge economy" over the 20th-century industrial base. Backed by considerable research, the education of the work force—best defined as the percentage of the work force over age 25 with a college degree—is key to the economic success of a business, a metropolitan area, and ultimately the country.

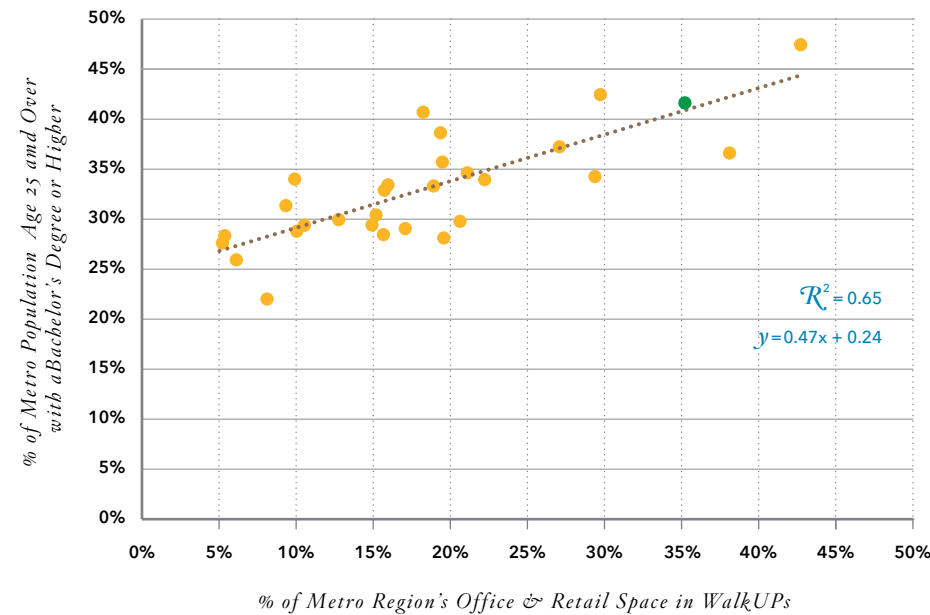
The Milken institute, in its paper entitled *A Matter of Degrees*, found that adding one year to the average year of schooling is associated with an increase in real GDP per capita of 10.5 percent and an increase in real wages per worker of 8.4 percent, even after controlling for many other variables.²¹ As Edward Glaeser, a professor of economics at Harvard University stated, "The most successful economic development policy is to attract and retain smart people and then get out of their way."²²

The connection between the educated work force and walkable urbanism has been best made by Richard Florida, director of the Martin Prosperity Center at the University of Toronto School of Management and originator of the concept of the "creative class." As Florida says in *The Rise of the Creative Class Revisited*, "the Creative Class is ... the key force that is shaping our geography, spearheading the movement back from outlying areas to urban centers and close-in walkable suburbs."²³ The City Observatory, a think tank focused on cities, confirmed this general trend in a recent report, which found that 25-34 year olds with college degrees are migrating disproportionately towards close-in urban neighborhoods.

Our own survey of the largest 30 metropolitan areas, *Foot Traffic Ahead*,²⁴ found per capita GDP was strongly correlated to walkable urbanism, as measured by the percentage of the region's office and retail space in WalkUPs and educational attainment, as measured by the percentage of people over 25 with college degrees. These correlations are illustrated in the

Walkable Urbanism, Higher Education & Metropolitan GDP in the Top 30 U.S. Metros

Correlation: Educational Attainment & Walkability



● METROPOLITAN BOSTON
● U.S. TOP 30 METROS

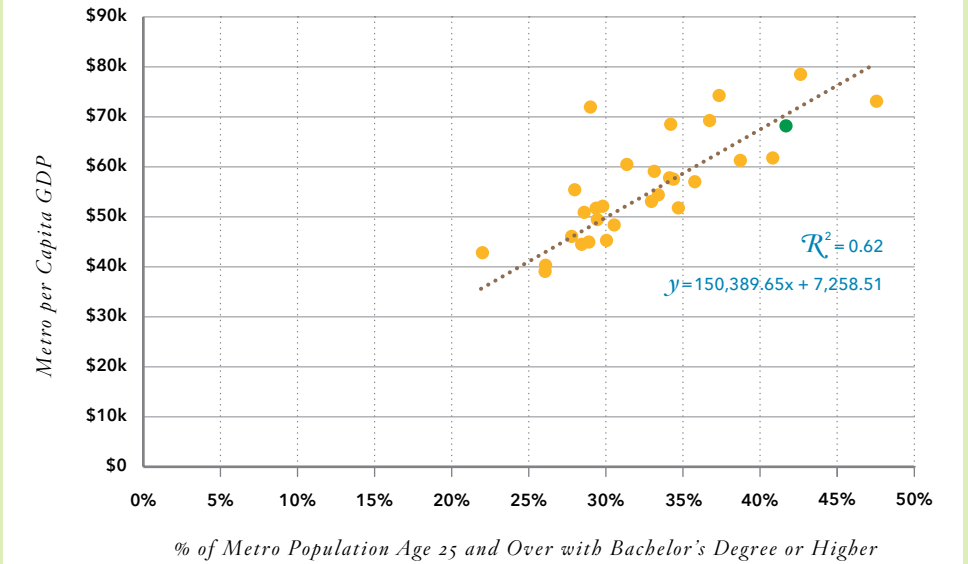
Since 2000, Boston's walkable urban places, which constitute just 5.4 percent of metro area land, have attracted nearly 70 percent of Metro Boston's growth in young, college-educated people.

charts on pages 30 and 31. Of the 30 metro areas surveyed, Boston had the third-highest amount of walkable urbanism, the third-highest educational attainment, and ranked seventh in per capita GDP.

These correlations do not prove causation and in fact, causation may run both ways among these variables. For example, metro areas with high per capita GDPs may attract more educated people, who then demand walkable places, just as walkable places may attract educated people, which then increase GDP per capita. Also, there may well be additional variables driving the relationship. All of this warrants further research.

Nonetheless, the ranks of the young and educated seem particularly drawn to Boston's walkable urban places. Since 2000, the Boston metropolitan area has added approximately 52,000 people under the age of 34 with college degrees. We estimate that 41 percent of this population has chosen to locate in a WalkUP and a further 28 percent in Walkable Neighborhoods (as reported above, only 5.4 percent of the metro area is walkable urban). This means that walkable urban places, where 39 percent of all people live, have attracted nearly 70 percent of the growth in young, educated people in the Boston metro area.²⁵

Correlation: Educational Attainment & GDP Per Capita (2013 per capita GDP, chained 2009 dollars)



Correlation: Walkability & GDP Per Capita (2013 per capita GDP, chained 2009 dollars)





WALKUP RANKINGS

MEMORIAE EORVM
QVI HIS IN SEDIBVS INSTITVT
MORTEM PRO PATRIA OPREVERVNT
M DCCC LXI



The charts at the right show the average rents and assessed values per acre for each Metropolitan Boston's WalkUPs at each Economic Ranking level.

The charts also show the overall averages for Metro Boston's Edge Cities as a point of comparison.

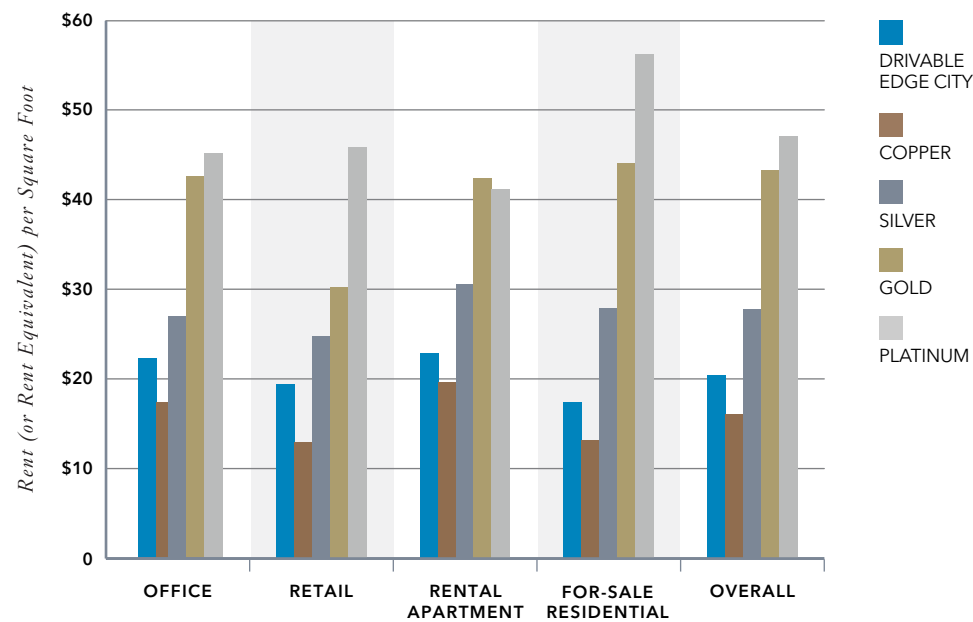
Economic Rankings

WalkUPs in Metropolitan Boston fall into four levels when measured by economic performance. Each WalkUP level has different growth and investment potential.

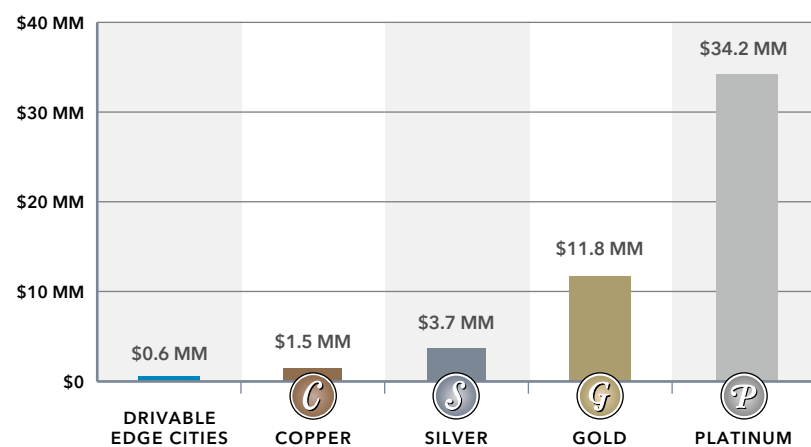
Economic rankings for WalkUPs are based on the rents per square foot achieved for four product types: office, retail, rental apartments, and for-sale housing (translated into a rent per square foot equivalent), and the total assessed value. Each WalkUP's average rent per square foot was determined and weighted according to the percentage of square feet by product type. The assumption is that the amount the market is willing and able to pay in terms of rent and value is a proxy for that WalkUP's economic performance. It is also a crucial metric for real estate investors and developers trying to understand where the WalkUP stands on the risk-reward curve.

The average weighted rents per square foot range from \$10.44 to \$52.28 in Boston's WalkUPs and the assessed value per acre ranges from \$745,000 to \$60 million. A metal rankings system for WalkUPs that ranks each metric equally has been determined, Platinum is the highest, while Gold is the second highest and considered to be a place that has attained "critical mass."²⁶ Silver is the third highest and Copper is the lowest.

Average Rents by Product Type



Assessed Values per Acre (\$ Millions)



- Attleboro
- Brockton
- Downtown Fall River
- Downtown Gloucester
- Downtown New Bedford
- Downtown Peabody
- Downtown Salem
- Downtown Worcester
- Downtown Beverly
- Dudley Square
- Fitchburg
- Framingham
- Haverhill
- Lawrence
- Lowell
- Lynn/Central Square
- Marlborough
- North New Bedford/Acushnet Ave.
- Norwood
- Plymouth
- Taunton BID
- Wakefield

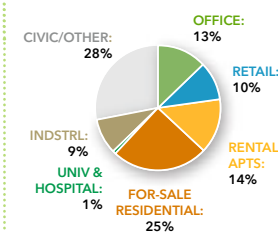
Average Key Metrics

Walk Score: 83
Intersection Density: 132
Gross FAR: 0.56 (Floor Area Ratio)
Assessed Value per Acre: \$1.49 million

Annual Rent per Sq. Ft. (\$ = \$5)
OFFICE: \$\$\$\$ \$17.48
RETAIL: \$\$\$ \$12.95
RENTAL APARTMENTS: \$\$ \$19.75
OVERALL AVERAGE: \$\$\$ \$16.17

Housing per Sq. Ft. (\$ = \$10)
FOR-SALE RESIDENTIAL: \$\$\$\$\$ \$149.00

Square Footage Breakdown by Use:



CHARACTERISTICS

The lowest level of economic performance, Copper WalkUPs in Boston primarily consist of Regional Urban Centers that initially developed during the industrial revolution in the 19th century. Many of them are still coping with the steady erosion of manufacturing as a source of employment, which has characterized the U.S. economy for the last several decades. In some cases, there were misguided attempts in the 1970s at urban renewal, which left unsightly scars and damaged the urban fabric. With the exception of Dudley Square, all Copper WalkUPs are located beyond the Inner Core of the Boston metropolitan area (outside Route 128). Their physical distance from Boston's Inner Core, the epicenter of the metro area's current knowledge economy, has also limited spillover walkable urban development thus far.

Compared to Edge Cities, average rents in Copper WalkUPs are lower for all of the evaluated product types. On a weighted average basis, Copper WalkUP rents are about 74 percent of the average for Edge Cities. Despite lower rents, the assessed value per acre of these WalkUPs is still much higher than for Edge Cities, because of their greater density.

OBSERVATIONS

Many of these places have strong potential for future economic growth. As WalkUPs in the Inner Core become increasingly expensive, both for residents and businesses, the relative affordability of these places will only increase. That should eventually bring new development and demand to these places, especially for those with commuter rail service, such as Brockton and Wakefield, and/or those in the "favored quarter," such as Framingham. The favored quarter²⁷ in Metro Boston generally extends to the west.

In addition, many of the Copper-ranked WalkUPs have inherited a street network devised before the rise of the automobile, meaning they have the appropriate "bones" for future walkable urban development. Given the costs of retroactively building such a network, this is not an insignificant asset. Unfortunately, some of these WalkUPs do not have appropriate zoning for what the market wants, generally not allowing sufficient density for new development and economic growth to emerge.

The Hamilton Canal District in Lowell, Mass, provides evidence of the potential for these places. The plan calls for the redevelopment of a declining industrial district into a mixed-use, transit-oriented development that will include 400,000 square feet of commercial space and the addition of more than 700 new housing units, many affordable. Implementation is already underway.

SILVER

- Allston
- Arlington
- Charlestown
- Downtown Quincy
- Fields Corner
- Lower Allston
- Malden Center
- Mission Hill
- Newburyport
- North Dorchester
- Porter Square/Davis Square
- Roxbury
- Tufts
- Waltham
- Watertown
- Woburn

Average Key Metrics

Walk Score: 80
Intersection Density: 173
Gross FAR: 0.65
(Floor Area Ratio)
Assessed Value per Acre:
 \$3.71 million

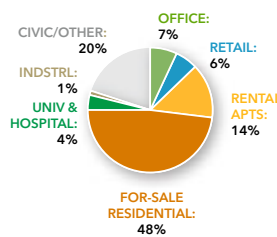
Annual Rent per Sq. Ft. (\$ = \$5)

OFFICE: \$\$\$\$\$\$\$\$\$ \$27.03
RETAIL: \$\$\$\$\$\$\$\$\$ \$24.81
RENTAL APARTMENTS: \$\$\$\$\$\$\$\$\$ \$30.69
OVERALL AVERAGE: \$\$\$\$\$\$\$\$\$ \$27.82

Housing per Sq. Ft. (\$ = \$10)

FOR-SALE RESIDENTIAL: \$\$\$\$\$\$\$\$\$ \$384.00
 \$\$\$\$\$\$\$\$\$
 \$\$\$\$\$\$\$\$\$
 \$\$\$\$\$\$\$\$\$
 \$\$\$\$\$\$\$\$\$
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Square Footage Breakdown by Use:



CHARACTERISTICS

The WalkUPs ranking in the Silver category are a diverse set and are all located inside Route 128, with the exception of Newburyport. Silver WalkUPs have not yet achieved “critical mass,” defined as not requiring government assistance or subsidy for new development. However, they have a trajectory that suggests they will continue to develop into higher-performing walkable urban places.

Silver WalkUPs have rents that are 72 percent higher, on average, than Copper WalkUPs and 36 percent higher than Edge Cities. The greatest difference is in the price of for-sale residential (and therefore its estimated rental value), which is more than double that of Copper WalkUPs. Silver WalkUPs’ average Walk Score is slightly lower at 80 than that of Copper WalkUPs (83), but both the average FAR and average intersection density are higher than Copper WalkUPs. The average assessed value per acre of \$3.7 million is 150 percent higher than Copper WalkUPs and 6.6 times higher than Edge Cities.

OBSERVATIONS

Silver WalkUPs have the greatest value creation potential for investors and developers. They may still have an image as being economically risky, which is reflected in their high capitalization rates and lower valuations, as compared to the Gold and Platinum WalkUPs. These places are likely to be improved by more development and place management. In time, WalkUPs that are ranked as Silver will yield the greatest relative financial return of any of the ranked WalkUPs.

GOLD

- Cambridgeport
- Central Cambridge
- Chinatown
- Coolidge Corner
- East Cambridge
- Harvard Square
- Kenmore/Fenway
- Longwood Medical Area
- Northeastern
- North End
- Seaport
- South End
- West End

Average Key Metrics

Walk Score: 89
Intersection Density: 299
Gross FAR: 1.05
(Floor Area Ratio)
Assessed Value per Acre:
 \$11.76 million

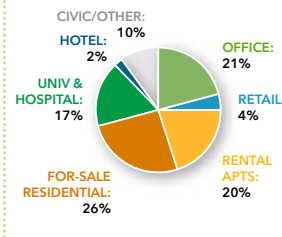
Annual Rent per Sq. Ft. (\$ = \$5)

OFFICE: \$\$\$\$\$\$\$\$\$ \$42.67
RETAIL: \$\$\$\$\$\$\$\$\$ \$30.32
RENTAL APARTMENTS: \$\$\$\$\$\$\$\$\$ \$42.45
OVERALL AVERAGE: \$\$\$\$\$\$\$\$\$ \$43.41

Housing per Sq. Ft. (\$ = \$10)

FOR-SALE RESIDENTIAL: \$\$\$\$\$\$\$\$\$ \$670.00
 \$\$\$\$\$\$\$\$\$
 \$\$\$\$\$\$\$\$\$
 \$\$\$\$\$\$\$\$\$
 \$\$\$\$\$\$\$\$\$
 \$\$\$\$\$\$\$\$\$
 \$\$\$\$\$\$\$\$\$
 \$\$\$\$\$\$\$\$\$
 \$\$\$\$\$\$\$\$\$

Square Footage Breakdown by Use:



CHARACTERISTICS

Gold WalkUPs have achieved critical mass; there is a “there there.” Investors recognize this by lower capitalization rates (increases valuations). Land prices are at a premium, reflecting the higher rents and sale per-square-foot prices that have been achieved. Overall rents in Gold WalkUPs are 56 percent higher than in Silver WalkUPs and 112 percent higher than in Edge Cities. Even when compared to the five highest-performing Edge Cities, which have weighted-average rents of approximately \$30, Gold WalkUPs maintain a premium of 45 percent.

OBSERVATIONS

Developers are attracted to Gold WalkUPs since the market risk is lower and they are relatively assured of “exit strategies” for selling stabilized projects to institutional investors. However, given the high land prices, there is a smaller upside for investment returns. Institutional investors are more attracted to Gold WalkUPs because there is some upside remaining in asset pricing (moving to Platinum), but low risk.



PLATINUM

Back Bay
Beacon Hill
Downtown BID
Financial District
(Boston)
MIT/Kendall Square

Average Key Metrics

Walk Score: 91
Intersection Density: 344
Gross FAR: 2.20
(Floor Area Ratio)
Assessed Value per Acre:
\$34.2 million

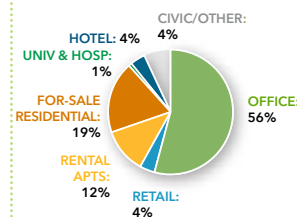
Annual Rent per Sq. Ft.
(\$ = \$5)

OFFICE:
\$45.24
RETAIL:
\$45.91
RENTAL APARTMENTS:
\$41.26
OVERALL AVERAGE:
\$47.21

Housing per Sq. Ft. (\$ = \$10)

FOR-SALE RESIDENTIAL:
\$794.00

Square Footage
Breakdown by Use:



CHARACTERISTICS

Only five of the 57 WalkUPs identified in Metropolitan Boston are ranked as Platinum. All are located either in Downtown or nearby. Platinum WalkUPs are predominantly where large institutional owners, such as insurance companies, pension funds, sovereign wealth funds, and REITs, have chosen to invest, resulting in the lowest capitalization rates and the highest valuations and land prices in the metropolitan area.

Platinum WalkUPs have average overall rents of \$47.21 per square foot, nine percent higher than the average for Gold WalkUPs and 130 percent higher than for Edge Cities. When compared to the five highest performing Edge Cities, Platinum WalkUP rents are 57 percent higher. The average assessed value per acre is \$34.2 million—23 times higher than Copper WalkUPs and 61 times higher than the average for Edge Cities.

OBSERVATIONS

Institutional investors hold Platinum WalkUP assets over the long term. Due to the limited number of Platinum WalkUPs and assets within them, owners do not tend to sell these assets very often. There also is anecdotal evidence that over the past decade investors have increased their hold time of these assets, much to the chagrin of mortgage and investment bankers who make their living trading properties. If this becomes the norm, it would reverse the late 20th-century trend of institutional investors holding assets for shorter time periods. For example, many insurance companies cut their average asset hold of about 10 years in half during the 1990s. This would prove the theory that walkable urban assets improve as critical mass is achieved and more urban vitality is built in a WalkUP. There is no reason to sell if the best investment in real estate is a vital walkable urban place. Owners achieve an “upward spiral” of value creation just by maintaining their property, propelled by other neighboring investors in the WalkUP.



Social Equity Rankings

WalkUPs fall into the same four levels as the economic rankings, although driven by entirely different variables: Accessibility, Opportunity, and Affordability.

While economic performance is obviously the principal objective of real estate, public policy must take into account a variety of other concerns, and increasingly prominent among those is the issue of social equity. From federal agencies to municipal governments and community-based organizations, there is a growing interest in ensuring that public policies and private investments are oriented so as to improve economic opportunity for the disadvantaged; reduce disparate burdens on low-income, minority, and immigrants; and minimize displacement from areas experiencing reinvestment.

To better understand the social equity dimensions of the WalkUPs that have been defined, the research team developed social equity rankings that characterize the extent to which low-income and minority residents can benefit from housing and economic opportunities in those places—and the extent to which existing residents might be affected by escalating rents and sale prices.

Metrics Used to Determine Social Equity

In examining social equity, we looked at nationally available measures of accessibility, opportunity and affordability. The final six measures (four in accessibility/opportunity and two in affordability) selected include the following:

ACCESSIBILITY (1/3 of Social Equity ranking)

- Transit Accessibility**
Proportion of the region’s working-age population that can access the WalkUP by transit within 45 minutes, a measure created by the EPA and available in the Smart Location Database. This measure takes into account actual travel times by transit during the PM peak hours, and includes walking, waiting, in-vehicle travel and transfer times. Accessibility by transit is an important measure of access to the WalkUP for residents of the region, especially in WalkUPs close to the Boston/Cambridge/Somerville area, where driving can be prohibitively expensive and inconvenient.
- ABC Commuting Accessibility**
Proportion of the WalkUP’s residents that commute by non-car modes (i.e. Transit, Biking, Walking), a measure available in the American Community Survey. This measure reports actual commuting behavior; the presence of transit alone does not necessarily reflect its actual use. In general, if people can and do reach their jobs by non-car modes, the WalkUP is considered more accessible than one where transit is available but not well utilized.

OPPORTUNITY (1/3 of Social Equity ranking)

- Job Density**
Calculated as a WalkUP’s average number of jobs per acre. For this report, the number of jobs is approximated from the InfoUSA 2011 database due to the lack of availability of the commonly used Longitudinal Employer-Household Dynamics (LEHD) survey in Massachusetts. This measure is included as an opportunity for employment in the WalkUP.
- School Reading Proficiency**
Percent of test takers in the WalkUP’s elementary and elementary/middle schools that score at least proficient in reading, calculated using Massachusetts Comprehensive Assessment System data. This measure is included as an opportunity for quality schools for resident families.

AFFORDABILITY (1/3 of Social Equity ranking)

- Location Affordability Index**
Housing and transportation costs as a percentage of area median income, a measure developed by HUD. Since housing and transportation costs are generally linked, especially if the household has to “drive till you qualify,” exchanging lower housing costs for higher transportation costs, this measure combines the overall expenses paid by the WalkUP’s residents on both of these living expense categories.
- Housing Cost Burden**
Proportion of households under 100% Area Median Income that are severely housing cost-burdened (50%+ of income spent on housing), a measure we calculated using data provided by HUD as part of the Comprehensive Housing Affordability Strategy (CHAS) dataset. This measure provides the level of cost burden that comes specifically from housing. It is included both to provide an alternative source of housing costs and to reflect the reality that housing costs alone can frequently be crippling for residents whose income is less than the Area Median Income.

Our Social Equity rankings are based on two components: Accessibility/Opportunity and Affordability. A WalkUP ranks high on accessibility/opportunity if it is easy to reach for a large share of the region's population and accessible by non-driving modes, and if it provides opportunities for jobs and good schools. A WalkUP ranks high on affordability if it is not severely cost-burdened by housing and transportation costs.

On these measures, WalkUPs tend to be more accessible, and have higher work opportunities than the rest of the region. The cost of that opportunity seems to vary depending on the data source and methodology. While HUD's Location Affordability Index indicates that average housing and transportation costs are both lower in WalkUPs than in Edge Cities and Sub-divisions, the proportion of households earning less than Area Median Income with severe housing cost burdens is clearly higher in WalkUPs than anywhere else. The ranking incorporates both measures and the result is that WalkUPs tend to have significantly more accessibility and opportunity than Edge Cities or Sub-divisions but are less affordable. Walkable Neighborhoods tend to be both more affordable and offer slightly more opportunity than either Edge Cities or Sub-divisions. However, as with economic rankings, the summary is hiding a lot of variation in social equity within each category.

The accessibility and opportunity measures are correlated with each other; generally, WalkUPs that are accessible also have higher opportunity and those that are less accessible have lower levels of opportunity. Therefore, they are combined into one scale of accessibility/opportunity. The affordability measure is also correlated with accessibility and opportunity, but in opposite directions (places with high affordability tend to be inaccessible and vice versa), reflecting a different dimension of social equity. The measures within accessibility, opportunity, and affordability are weighted equally.

The scatterplot on pages 40 and 41 shows the tradeoffs between affordability and accessibility/opportunity; WalkUPs in the Inner Core, like the Downtown and Financial District are accessible but not

affordable. In contrast, WalkUPs on the outer edges of the commuter rail system, like Worcester, New Bedford, and Fall River, are affordable but difficult to access.

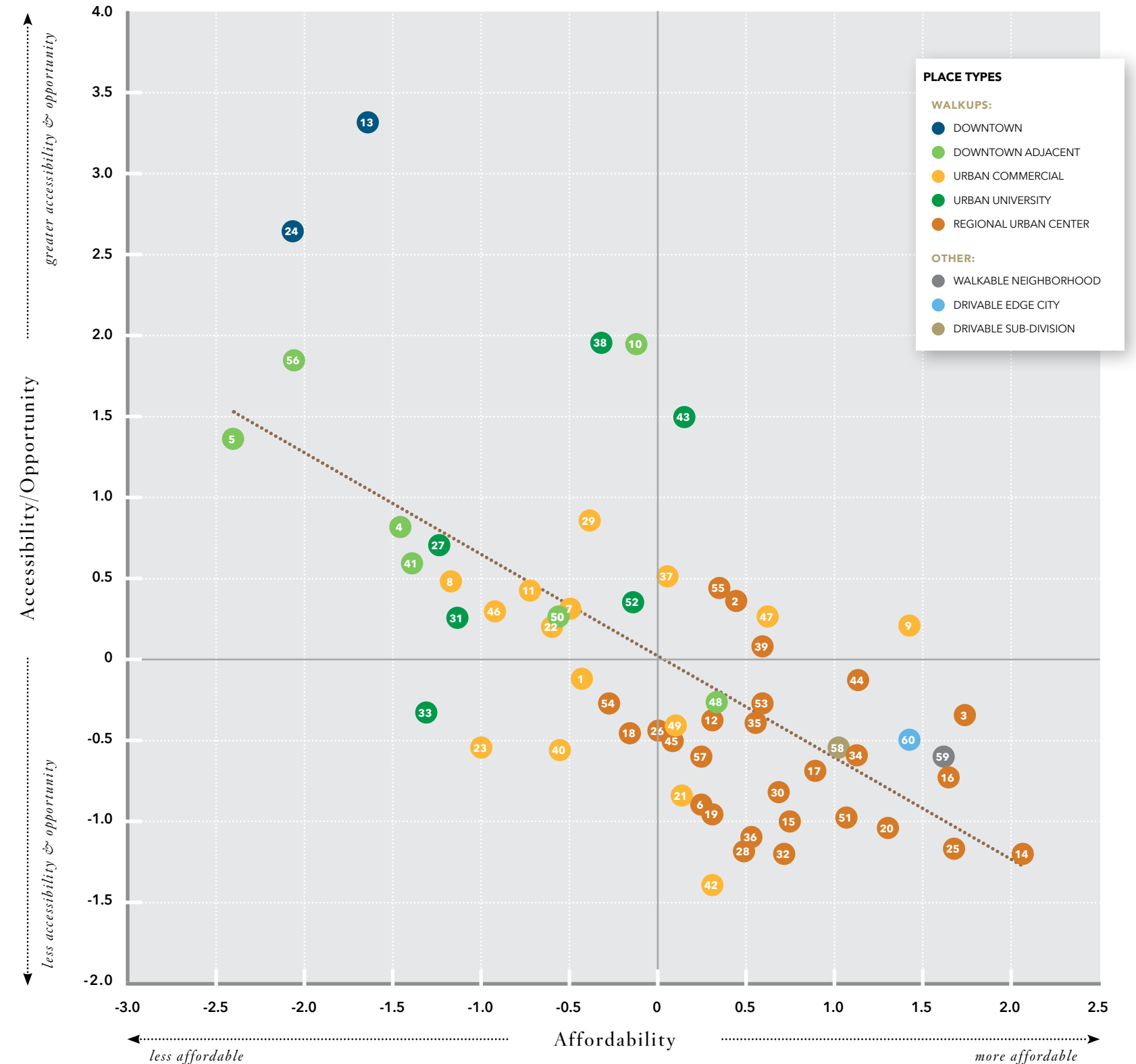
The WalkUPs that provide some combination of affordability, accessibility, and good work and school opportunities are ranked as Platinum on the social equity scale. Those that are relatively unaffordable, not easily accessible, or do not provide good opportunities are ranked as Copper. The rest are ranked either Silver or Gold, depending on their levels; however, a WalkUP will not rank as Gold or Platinum if it scores Copper in either of the two component measures. For instance, a WalkUP with an extremely high accessibility/opportunity score, like the Financial District, cannot overcome its Copper affordability score, and ends up being scored a Silver. Conversely, if a WalkUP scores a Platinum on either measure, it is ranked at least at Silver.

As rankings go from Copper to Platinum, for example, the transit coverage (percent of region's population accessible to the WalkUP within 45 minutes by transit) goes up from four percent to 18 percent. This reflects the easier access to the WalkUP from the rest of the region due to higher quality and frequency of transit. At the same time, however, the housing cost burden (percent of low income households that spend at least 50 percent of income on housing) does not decrease substantially until Platinum levels. Even then it remains quite high, reflecting the conflict between affordability and access.

WalkUPs as a group pay a large premium in housing costs at all levels. The combination of affordability and accessibility/opportunity despite the inherent tradeoffs make the Gold and Platinum WalkUPs more socially equitable than the Copper and Silver ones. Unfortunately, many WalkUPs that rank high on the Economic scale fall into the lower ranks of the Social Equity scale and vice versa.

- ID# WALKUPS
- 1 Allston
- 2 Arlington
- 3 Attleboro
- 4 Back Bay
- 5 Beacon Hill
- 6 Brockton
- 7 Cambridgeport
- 8 Central Cambridge
- 9 Charlestown
- 10 Chinatown
- 11 Coolidge Corner
- 12 Downtown Beverly
- 13 Downtown BID
- 14 Downtown Fall River
- 15 Downtown Gloucester
- 16 Downtown New Bedford
- 17 Downtown Peabody
- 18 Downtown Quincy
- 19 Downtown Salem
- 20 Downtown Worcester
- 21 Dudley Square
- 22 East Cambridge
- 23 Fields Corner
- 24 Financial District (Boston)
- 25 Fitchburg
- 26 Framingham
- 27 Harvard Square
- 28 Haverhill
- 29 Kenmore/Fenway
- 30 Lawrence
- 31 Longwood Medical Area
- 32 Lowell
- 33 Lower Allston
- 34 Lynn/Central Square
- 35 Malden Center
- 36 Marlborough
- 37 Mission Hill
- 38 MIT/Kendall Square
- 39 Newburyport
- 40 North Dorchester
- 41 North End
- 42 North New Bedford/Acushnet Ave.
- 43 Northeastern
- 44 Norwood
- 45 Plymouth
- 46 Porter Square/Davis Square
- 47 Roxbury
- 48 Seaport
- 49 South Boston
- 50 South End
- 51 Taunton BID
- 52 Tufts
- 53 Wakefield
- 54 Waltham
- 55 Watertown
- 56 West End
- 57 Woburn
- 58 Drivable Sub-division
- 59 Walkable Neighborhood
- 60 Drivable Edge Cities

Scatterplot Showing Distribution of Accessibility/Opportunity vs. Affordability of Metropolitan Boston's Regionally Significant WalkUPs

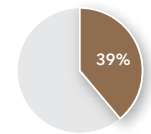


COPPER

- Brockton
- Downtown Gloucester
- Downtown Salem
- Dudley Square
- Haverhill
- Lawrence
- Lowell
- Lower Allston
- Marlborough
- North New Bedford/
Acushnet Ave.

Average Key Metrics

Housing & Transportation Costs:
(As a % of median income for Metropolitan Boston)



Housing Cost Burden: 48%
(% of low income households that spend at least 50% of income on housing)

Job Density: 13 per acre

School Quality: 43%
(% of students with proficient or higher reading level)

Transit Accessibility: 4%
(Share of population that can access the WalkUP by transit within 45 minutes)

ABC Commuting: 24%
(Non-car mode commutes)

Of the 57 WalkUPs in the Boston area, 10 score a Copper on the social equity scale. Copper-ranked WalkUPs are primarily located outside of the Inner Core of the Boston metropolitan area (with the exception of Dudley Square and Lower Allston). They are mostly served only by commuter rail and/or regional transit service and have relatively few job opportunities. However, almost all are in fact affordable for their residents. Since affordability accounts for one-third of the final score, a Gold ranking in that category is insufficient to overcome the Copper ranking in the measures of accessibility/opportunity. This categorization reflects the reality that affordable living conditions without access to higher opportunity areas is inequitable.

In addition, the average unemployment rate in Copper WalkUPs is 17 percent, an extremely high level for the region, which further supports the low opportunity assessment. Similarly, the low level of affordability (due to the high cost of housing relative to income) is exacerbated by a lack of subsidized housing. On average, just over one percent of the units in these WalkUPs are subsidized.

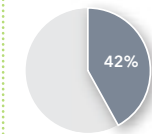
No WalkUPs have Copper rankings in both accessibility/opportunity and affordability. Most rank as Gold in affordability, so most WalkUPs in this region would be best served by addressing their transit quality and opportunity metrics while striving to maintain affordability.

SILVER

- Allston
- Back Bay
- Beacon Hill
- Downtown Beverly
- Downtown BID
- Downtown Fall River
- Downtown New Bedford
- Downtown Peabody
- Downtown Quincy
- Downtown Worcester
- Fields Corner
- Financial District (Boston)
- Fitchburg
- Framingham
- Harvard Square
- Malden Center
- North Dorchester
- North End
- Plymouth
- Seaport
- South Boston
- Taunton BID
- Wakefield
- Waltham
- West End
- Woburn

Average Key Metrics

Housing & Transportation Costs:
(As a % of median income for Metropolitan Boston)



Housing Cost Burden: 48%
(% of low income households that spend at least 50% of income on housing)

Job Density: 65 per acre

School Quality: 51%
(% of students with proficient or higher reading level)

Transit Accessibility: 12%
(Share of population that can access the WalkUP by transit within 45 minutes)

ABC Commuting: 38%
(Non-car mode commutes)

The 26 Silver-ranked WalkUPs are a diverse set, largely due to the rule that a Copper ranking in either affordability or accessibility/opportunity disqualifies a WalkUP from achieving a Gold or Platinum ranking. There are several balanced WalkUPs, like Allston, Fields Corner, and Dorchester, with Silver rankings in both sub-categories. But the majority of these WalkUPs show a large discrepancy between affordability and accessibility/opportunity. This discrepancy, especially in places like Beacon Hill and Downtown BID, which are among the least affordable but the most accessible, show the tradeoff that frequently exists between accessibility and livability. The places with the highest access and opportunity demand a higher cost premium.

Conversely, affordable places like Taunton and Fitchburg are very difficult to get to because they are frequently on the outer reaches of the commuter rail system. They provide an affordable living situation, but little opportunity within the WalkUP and low access to other WalkUPs in the region.

The averages on the metrics for the Silver WalkUPs are hiding important differences between the three types of WalkUPs in this category: (1) balanced WalkUPs, (2) affordable-but-inaccessible WalkUPs, and (3) accessible-but-unaffordable WalkUPs. In order to improve their social equity ranking, these WalkUPs need to address their specific deficiencies.

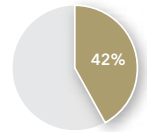
In addition, the unemployment rate in the Silver WalkUPs averages 10 percent, a strong improvement over Copper. But once again, similar to the job density measure, this average does not reflect the wide range of unemployment rates within this category.

G GOLD

- Attleboro
- Cambridgeport
- Central Cambridge
- Coolidge Corner
- East Cambridge
- Kenmore/Fenway
- Longwood Medical Area
- Lynn/Central Square
- Norwood
- Porter Square/Davis Square
- South End

Average Key Metrics

Housing & Transportation Costs:
(As a % of median income for Metropolitan Boston)



Housing Cost Burden: 49%
(% of low income households that spend at least 50% of income on housing)

Job Density: 34 per acre

School Quality: 53%
(% of students with proficient or higher reading level)

Transit Accessibility: 15%
(Share of population that can access the WalkUP by transit within 45 minutes)

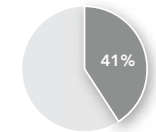
ABC Commuting: 51%
(Non-car mode commutes)

P PLATINUM

- Arlington
- Charlestown
- Chinatown
- Mission Hill
- MIT/Kendall Square
- Newburyport
- Northeastern
- Roxbury
- Tufts
- Watertown

Average Key Metrics

Housing & Transportation Costs:
(As a % of median income for Metropolitan Boston)



Housing Cost Burden: 43%
(% of low income households that spend at least 50% of income on housing)

Job Density: 41 per acre

School Quality: 67%
(% of students with proficient or higher reading level)

Transit Accessibility: 18%
(Share of population that can access the WalkUP by transit within 45 minutes)

ABC Commuting: 49%
(Non-car mode commutes)

CHARACTERISTICS

Ten of the 57 WalkUPs identified in Boston are ranked as Platinum on the social equity scale. Almost all are Inner Core communities very close to the financial and job centers of the region. But they also have remained somewhat affordable to their residents through inclusion of subsidized housing or by retaining traditionally affordable units.

Even here, however, there are tradeoffs between affordability and accessibility; there is not one WalkUP that manages to score Platinum on both sub-scales. Scoring Gold in both categories is enough to place a WalkUP into the overall Platinum category due to this tradeoff, as happens, for example, with Arlington, Watertown, and Roxbury.



WalkUPs: The Next Wave

There are more WalkUPs in Metropolitan Boston waiting in the wings, the vast majority in the suburbs.

In addition to the established WalkUPs, we also identified where WalkUPs may develop in the future. Our analysis found two categories of such places: Emerging and Potential. Emerging WalkUPs are those places that narrowly missed the minimum thresholds for either walkability or the quantity of commercial space that characterize the Established WalkUPs. With the addition of one or two new developments or a slightly denser street grid, these Emerging WalkUPs would move into the ranks of the established.

Unlike in Atlanta, where the Emerging WalkUPs were mainly drivable sub-urban commercial concentrations in the process of urbanizing, in Boston we found older urban town centers or close-in industrial areas that are already walkable to some extent. Almost all of them have high Walk Scores but they do not quite have enough commercial space to meet the threshold. Some had an auto-oriented street layout despite the moderately high Walk Score.

Potential WalkUPs are areas that have certain attributes that lend themselves to the development of a walkable urban place in the future as well as the demonstrated intent to become a walkable urban place, even if they currently lack critical mass. They are not well-defined “places” as such. Therefore, we have only listed the towns in the Boston region that contain them, rather than attempt to give each a name or define the geography. To be considered a potential WalkUP, towns must have at least some land area that meets the following criteria for both physical attributes and intent, meaning taking action to approve appropriate zoning, creating place management organizations, etc.:

- **Physical Attributes:** *At least one of the following:*
 - Located within a half mile of a **rail transit station**
 - **Gross density residential units** ≥ 8 per acre within a quarter mile
 - **Intersection density** ≥ 100 per square mile
- **Measure of Intent:** *Participate in or designation of some area under one of the following Commonwealth of Massachusetts programs:*
 - Chapter 43D or 43E
 - Gateway City
 - Growth District Initiative grant
 - District Local Technical Assistance Program
 - Approved Chapter 40R district
 - Priority Development Area
 - Mixed use zoning adoption

- Assembly Row
- Brickbottom - Innerbelt
- Brighton
- Chelsea
- Danvers
- East Boston
- Ipswich
- Leominster
- Lexington
- Mansfield
- Needham
- Newmarket/Widett Circle
- North Attleborough
- Wellesley Square

EMERGING WALKUPS

The 14 Emerging WalkUPs fall primarily into two camps—suburban town centers and close-in neighborhoods that are transitioning. The suburban town centers include, Danvers, Ipswich, Leominster, Lexington, Mansfield, Needham and Wellesley Square. All of these places could be considered local-serving Walkable Neighborhoods today but they are on the cusp of becoming regionally significant according to our definition. That is because they all have at least 306,000 square feet of retail, which is 90 percent of the 340,000 square foot threshold used for the established WalkUPs.

The close-in neighborhoods include Assembly Row, Chelsea, Newmarket/Widett Circle, Brickbottom/Innerbelt, and East Boston. Assembly Row is a new mixed-use development project on a brownfield site in Somerville that only recently completed its first phase, which includes 320,000 square feet of retail, 445 apartments, and 100,000 square feet of office. When complete, it will have over 600,000 square feet of retail and 2.8 million square feet of office, more than enough for it to qualify as an established WalkUP. The Brickbottom/Innerbelt area, also in Somerville, will have a new Green Line transit station, possibly as early as 2017, and various plans exist for transit-oriented development around it. Newmarket/Widett Circle is a primarily light industrial and retail area but a recent rezoning initiative and the opening of a new transit station in 2013 have laid the foundation for more a more walkable future. Finally, Chelsea and East Boston are urban commercial neighborhoods that have not quite met the criteria for the quantity of commercial space, but are very close.

- Everett
- Melrose
- Methuen
- Natick
- Reading
- Revere
- Stoughton
- Winchester

POTENTIAL WALKUPS

We identified 31 towns in the Boston metro area with at least some land area that met the potential criteria and that was not already designated as a WalkUP or an emerging WalkUP. However, for the majority of these places, the potential land area is located around places already designated as established or emerging WalkUPs. For example, much of Lynn, Somerville, and Dorchester in Boston met the potential criteria, but on land that was near an existing WalkUP. This confirms the notion that many WalkUPs have the potential for more development both within and around their existing boundaries.

Those towns with land that qualified as potential WalkUPs but which do not have an Established or Emerging WalkUP are listed.



NEXT STEPS

Conclusions & Recommendations

Metropolitan Boston is leading the country toward a walkable urban future. This is the time to develop conscious social equity strategies to address the walkable urban price premiums inherent in this trend. Failure to balance social equity and economic performance will stifle both.

For the last half of the 20th century, drivable sub-urban developments dominated the real estate development industry. The expansion of the highway system, the love affair with automobiles, the dream of having a piece of land to call one's own and being away from the declining center city motivated this shift. This form of development became imbedded in federal and state public policy with massive subsidies to provide the market in the post-war era what it wanted. For over 50 years, developers, homebuilders, and banks perfected a business model that transformed millions of acres across the country into Drivable Sub-divisions, business parks, strip shopping centers and regional malls.

This research has produced findings that indicate drivable sub-urban development may be nearing its end in some product types and that, at least in some metropolitan areas, "peak sprawl" may already have been reached. Metropolitan Boston is one of those metro areas moving beyond sprawl. This report has demonstrated not only strong and rising valuation premiums in WalkUPs and Walkable Neighborhoods for almost all product types, but also that walkable urbanism appears to be reversing its decades-long loss of market share to drivable sub-urban areas, particularly for office, hotel, and rental apartments.

INVESTMENT & DEVELOPMENT STRATEGIES

The shift towards walkable urbanism has major implications for real estate investors and policymakers. If current trends continue, drivable sub-urban real estate values are at risk of continued stagnation while values in WalkUPs and Walkable Neighborhoods will likely continue to increase.

But different economic and social equity performance levels of WalkUPs and Walkable Neighborhoods imply that different investment strategies will be required. For example:

- **Investing in a Copper WalkUP on the economic scale or Walkable Neighborhood** means that a long-term time frame is required to maximize returns, though entry prices are relatively modest. Place strategy and management for a Copper WalkUP are particularly important to ensure economic performance.

Starting to preserve affordable housing early in the process will be easier in a Copper-ranked place. And building adequate rail and bus transit, as well as biking and walking infrastructure, will promote economic development and social equity.

- **Silver WalkUPs and Walkable Neighborhoods** probably have the greatest potential for value appreciation and growth, but will take at least a mid-term time frame for an economic return to be achieved.

The social equity situation may show a misleading picture. There is a confusing mix of long-time residents and businesses in lower-cost space commingling with the new higher-price entrants.

This provides the diversity many people want, but it might quickly switch to a more homogeneous high-end place unless conscious social equity strategies are adopted and implemented.

- **Investing in Gold or Platinum WalkUPs and Walkable Neighborhoods** is much less risky as reflected in the high price of entry. Platinum investments might have less upside, but are more stable and, thus, make them more attractive to institutional investors (insurance companies, pension funds, REITs, etc.).

Engaging in social equity strategies, such as increased affordable housing and new transit, biking and walkability infrastructure is much more expensive in Gold and Platinum places if the effort is left until it achieves this high economic performance due to high land prices. Better to have started earlier in the redevelopment process.

POLICY IMPLICATIONS

Policymakers must understand how to position their communities to take advantage of this shift in market demand. At a minimum, the government must not discourage walkable urban development with outdated, auto-oriented zoning codes and parking regulations, or long public approval processes. The best approach for growing the economy, increasing local tax revenues and boosting funding for social equity strategies is increasing the supply of developable, walkable urban properties. The legal constraint on walkable urban supply is the number one reason for the substantial price premiums this research has uncovered.

Doing the minimum, however, may not be enough for many communities that have long suffered from disinvestment and a poor image to harness the potential of this shift in market demand. This is particularly true for those WalkUPs and Walkable Neighborhoods ranked Copper on the economic scale. In many cases, a major catalytic development effort is needed to transform these places and demonstrate their potential. Without public investment and appropriate zoning, these projects can be difficult to get off the ground, yet the payoff for the public investment has proven to be dramatic. And there is no need to subsidize these catalytic developments. Investing *pari passu* with private sector partners is the best approach, leading to eventual payback of capital with a hoped-for return, which can be invested in the next round of projects.

TRANSPORTATION AND INFRASTRUCTURE

The importance of investing in transportation infrastructure, particularly rail and bus transit, as well as biking and walking, cannot be underestimated. Transportation has always been one of the most significant determining factors behind the shape of the built environment and it is no different today. Rail transit in particular facilitates walkable urbanism. There will always be cars, and therefore roads, for the foreseeable future as a crucial element in a transportation system. However, car transportation should be viewed as one of many transportation options consumers should have. Metro Boston will have a hard enough time maintaining existing roadways that are already in place, so it is important to think twice before adding new roadway capacity.

Expensive as investments in rail transit and walkable urban infrastructure may be, there are growing indications, as this research indicates, that walkable urban development generates higher economic development and fiscal returns than drivable sub-urban development. Educated people are the foundation of the modern knowledge economy, and they seem to be drawn to metro areas with walkable urbanism. This is especially true of the millennial generation and the so-called creative class. Boston has already capitalized on this to sustain one of the highest educated workforces in the country, but competition for these people is intense. Transportation infrastructure that supports walkable urban development is the best investment for the future economy and tax base of Metro Boston.

PROTECTING SOCIAL EQUITY

Public support of walkable urban development in Metropolitan Boston must have a simultaneous commitment to social equity, providing increased opportunity to households that need affordable work force housing and transit, biking, and walkable accessibility to that opportunity. In the long run, an increased supply of walkable urban infrastructure and development is the major answer to the social equity challenge. However, the pent-up demand for walkable urbanism will probably take many years to address, resulting in continued price premiums at even higher rents and prices. What is needed is a conscious strategy in the short- and mid-term to achieve social equity, using the many tools that are available. These tools include expanding the current tax credit programs for rehabilitation, and low income housing and commercial space, inclusive zoning, legalizing auxiliary dwelling units,

investing public and nonprofit land into affordable and work force housing development, implementing anti-eviction policies, real estate transfer taxes, community benefit agreements, condo conversion ordinances, and there are many more tactics to consider.²⁸

FINAL COMMENTS

The research in Metro Boston and across the country demonstrates that walkable urban development can lead to an upward spiral of value creation; more development improves the quality of life, produces higher economic returns, boosts tax revenue and provides more money that can be invested in social equity strategies. However, it is more important than ever to ensure that this new cycle of investment does not displace existing residents, and provides additional opportunities for low-income households to live and work in WalkUPs. And the amount of land currently used for the walkable urban inventory, 5.6 percent of the regional land mass, is obviously a tiny fraction of the metro area. This small supply of walkable urban land is the major reason for the price premiums. Increasing the density of the existing walkable urban land and adding more walkable urban places, both WalkUPs and Walkable Neighborhoods, will fuel that upward spiral and increase the quality of life while improving the social equity of the metropolitan area.

APPENDICES

Endnotes

1. Leinberger, Christopher B., *The Option of Urbanism, Investing in a New American Dream*, Island Press, (Washington, DC), 2008, page 8.
2. These two terms employ the logic that “transportation drives development,” a principle that has been at work through the 6,000-year history of city/metropolitan building. The construction of these descriptive terms starts with the transportation system (drivable and walkable) and continues with the form that results (sub-urban and urban). There is a third form of the built environment, drivable urban, pioneered in theory by the Swiss architect, Le Corbusier. Best known in this country as “skyscrapers in the park,” it was infamously adopted for much of 20th century public housing and has been judged to be a massive failure, as the demolition of these “vertical slums” demonstrates. China’s rapid urbanization is predicated on this form of development, and the jury is out on whether this will result in a similar tragedy or not.
3. Leinberger, Christopher B. and Alfonzo, Mariela, <http://www.brookings.edu/research/papers/2012/05/25-walkable-places-leinberger>
4. Leinberger, Christopher B., *DC: The WalkUP Wake-UP Call, The Nation’s Capital As a National Model for Walkable Urban Places*, September 2012. http://issuu.com/gwbusiness/docs/dc_walkup/1
5. Leinberger, Christopher and Austin, Mason, *The WalkUP Wake-UP Call: Atlanta, The Poster Child of Sprawl Builds a Walkable Urban Future*, October 2013. http://issuu.com/gwbusiness/docs/gw_walkup_atlanta2013_ae49ee3092d-a4e/0
6. “The Rise of Innovation Districts: A New Geography of Innovation in America,” May 2014. <http://www.brookings.edu/~media/Programs/metro/Images/Innovation/InnovationDistricts1.pdf>
7. Intersection density is a measure of the number of road crossings per square mile. Drivable sub-urban development tends to have very low intersection density, reflecting super-blocks compatible with car/truck traffic, while walkable urban tends to have high intersection density, reflecting smaller blocks compatible with walking. The intersection density calculations in this report are based on the quantity of non auto-oriented intersections as determined by the EPA for the EPA smart location database mentioned above in endnote 2.
8. “Travel and the Built Environment: A Meta-Analysis,” Reid Ewing and Robert Cervero, *Journal of the American Planning Association*, Volume 76, Issue 3, 2010.
9. “Linking Objectively Measured Physical Activity with Objectively Measured Urban Form: Findings from SMARTRAQ,” *American Journal of Preventive Medicine*, 2005. http://www.yorku.ca/alison3/kahs6020/urban%20form%20-%20SMARTRAQ%20-%20Am%20J%20Prev%20Med%202005_28.pdf
10. This analysis excludes interstates and transit because they serve a regional function.
11. The data on square footage presented here is based on LA3 parcel data, a database of parcel-level data and CoStar. The LA3 parcel data, provided by MAPC, was used for the overall total, as well as the for-sale residential category. The estimates for office, retail, multifamily rental apartments, and industrial square footage come from CoStar. Neither data source is perfect for this exercise. CoStar does not track the entire universe of properties. The LA3 parcel data is not up to date for all towns in the metro area and does not identify whether a property is rented or owned. As such, these numbers should be treated as approximations. In particular, note that some properties in the for-sale residential category are actually rented.
12. Much of the space listed under Civic/Institutional falls into the “owner user” category of space. This includes many non-profits, universities, government buildings and other commercial space that occupied by non-tax paying entities. Although the assessment data permits an analysis of the total square footage and assessed value in this category, it does not permit breakdowns of this information by product type. This is a challenge across the country and will have to be addressed as further research is completed analyzing the totality of the built environment.
13. As an example of the calculation of caps rates, if a property has an annual net income of \$1,000 and it is sold for \$10,000, the cap rate is 10 percent (\$1,000/\$10,000). If it is sold for \$20,000, the cap rate is five percent (\$1,000/\$20,000). Lower cap rates are indicative of higher real estate values.
14. This data is based on information provided by Cushman and Wakefield. Cap rates represent averages weighted by the dollar volume of the transaction. For WalkUPs, almost all of the

Endnotes

transactions from which this average is derived, took place in WalkUPs within the Inner Core. Cap rates in outlying suburban town centers are more likely to be in line with those of the rest of the region.

15. Analysis assumes that expenses as a percentage of rent revenue are equal in the different areas
16. STR (Smith Travel)
17. CBRE, <http://www.cbre.us/o/fortlauderdale/AssetLibrary/Cap%20Rate%20Study%20First%20Half%202014.pdf>
18. This analysis is based on arms-length property closing data provided by the Massachusetts Department of Revenue Division of Local Services (<https://dls.gateway.dor.state.ma.us/gateway/Public/WebForms/LA3/LA3Search.aspx>) and square footage information contained in the MAPC parcel layer. Note that no data was available for sales in the City of Boston in 2005 and 2007. Therefore, those years are excluded from the charts.
19. MAPC, <http://www.mapc.org/projections>
20. Office, retail, rental apartment, and hotel deliveries are based on CoStar data. For-sale residential square footage is based on the parcel data provided by MAPC. Note, however, that the data for the most recent cycle (09-14) may not be accurate because not all towns have provided up-to-date data through 2014. The actual share of for-sale residential deliveries in the most recent cycle could be higher or lower.

21. "A Matter of Degrees: The Effect of Educational Attainment on Regional Economic Prosperity." *The Milken Institute*. Feb. 27, 2013. <http://www.milkeninstitute.org/publications/view/564>
22. "Where Young People are Choosing to Live," *The New York Times*, October 20, 2014. http://www.nytimes.com/2014/10/20/upshot/where-young-college-graduates-are-choosing-to-live.html?_r=0&abt=0002&abg=0
23. Richard Florida, *The Rise of the Creative Class* (New York, Basic Books, 2012).
24. Leinberger, Christopher B. and Lynch, Patrick, *Foot Traffic Ahead: Ranking Walkable Urbanism in America's 30 Largest Metros*," June 2014. http://issuu.com/gwbusiness/docs/foot_traffic_ahead/1.
25. Data on age and education in 2000 is not available below the Census tract level. Therefore, this estimate is based on a translation of 2000 census tract data to the defined geographies, as well 2009-2013 American Community Survey tract data to the defined geographies.
26. This research defines critical mass as a WalkUP that requires no extraordinary public investment or subsidy to stimulate the next real estate project. Silver and Copper WalkUPs may require public sector involvement to get a new project underway.
27. The "favored quarter" is the roughly 90-degree arc coming out of the downtown of the center city where the majority of upper-middle income households live and most commercial development, especially employment, occurred during the late 20th century. Every metro area

has a favored quarter of growth, though a few mega-metros, like New York and Los Angeles, have two or more.

28. <http://www.mapc.org/long-term-affordability-strategies>

Chart Data Sources:

PAGE 8: *Share of Income Property During the Last Three Real Estate Cycles*
Source: CoStar

PAGE 9: *Key Metrics by Land Use*
Sources: American Community Survey 2008-2012; InfoUSA 2011; Massachusetts Land Parcel Database; CoStar

PAGE 22: *Average Road Length per Capita*
Source: CREUA analysis of road data provided Massachusetts Department of Transportation; excludes Interstates

PAGE 23: *Share of Square Footage of Metropolitan Property Types in WalkUPs vs. Edge Cities and Share of Residential & Income-Producing Square Footage by Land Use Type*
Sources: Massachusetts Land Parcel Database; CoStar

PAGE 25: *Average Home Sale Price* (two charts)
Sources: CREUA analysis of transaction data from the Massachusetts Department of Revenue; Massachusetts Land Parcel Database

PAGE 29: *Share of Metro Income Property Square Footage Developed in WalkUPs & Walkable Neighborhoods*
Sources: CoStar; Massachusetts Land Parcel Database

PAGE 30 & 31: *Walkable Urbanism, Higher Education & Metropolitan GDP in the Top 30 U.S. Metros* (three charts)
Sources: CREUA; American Community Survey 2008-2012; Bureau of Economic Analysis

PAGE 34: *Average Rents by Product Type Assessed Values per Acre*
Source: Massachusetts Land Parcel Database

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