Boston Main Streets 2.0: Spreading Boston's Innovation Economy from the Innovation District to the Neighborhoods

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Abstract

In 2010, the City of Boston launched an effort on the South Boston waterfront to transform the area into the "Innovation District," an urban neighborhood that would attract innovative firms and nurture entrepreneurship. The initiative has been widely viewed as a success, but with that success has come rapidly rising rents and calls to expand the model to other Boston neighborhoods – both to provide more affordable alternatives for startup firms and to capitalize on the model's economic development potential. As policymakers explore potential options of expansion, this thesis first looks at the current innovative environment in Boston's neighborhoods, identifying through the existing literature a range of characteristics associated with the innovation economy and analyzing their intensity and spatial distribution in each neighborhood. Attention is then turned to an existing framework for multi-nodal business development in Boston: a set of 20 independent organizations collectively known as Boston Main Streets, which have a unique connection with the City of Boston. Through a series of interviews with executive directors of these organizations, this thesis provides insight into the organizations' current structure, their existing connections with the innovation economy, and future opportunities for such connections.

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1. Introduction

Innovation economy. Startups. Creative class. For many, these terms likely evoke images of the tech firms that have blossomed in Silicon Valley, Cambridge's Kendall Square, downtown Austin, or Seattle's South Lake Union neighborhood. Cities across the United States are looking to capitalize on the explosive growth of the innovation economy, not only to attract established companies, but also to foster entrepreneurship that can create new jobs.

Greater Boston's educated workforce and available capital have helped facilitate the development of innovation economy clusters in many sectors, including financial services, insurance, computer software and hardware, medical care, life sciences, advanced manufacturing, life sciences, business services, and more. All of these clusters have increased job growth in many other sectors, including real estate, hospitality, and other local services (Kahn et. al, 2012).

Seeking to capitalize on this existing regional economic strength, former Boston mayor Thomas Menino launched an initiative in 2010 known as the Innovation District, to "transform 1,000 acres of the South Boston waterfront into an urban environment that fosters innovation, collaboration, and entrepreneurship" (City of Boston, "Boston's Innovation District"). It was an ambitious project that took a hands on approach by local government in fostering the development of an innovation hub at the neighborhood level, rather than regional level.

Like traditional economic development programs, the City of Boston ("the City") has worked to attract some large firms – such as Vertex Pharmaceuticals – that can help anchor the neighborhood. The City has taken this a step further, though, in trying to foster a community of firms and entrepreneurs, rather than simply focusing on attracting individual firms. It created a public-private partnership to develop District Hall, a civic space that includes open workspaces, meeting rooms, and event spaces where entrepreneurs can gather to share ideas and network, and recruited the Cambridge Innovation Center to run the hall's programming. Perhaps the City's

most important roles, though, are that of marketer and facilitator. Its website has an extensive list of resources for entrepreneurs, including incubators, co-working spaces, and available office space, along with networking and social events going on in the Innovation District each day (City of Boston, "Boston's Innovation District").

The Innovation District has been successful in attracting scores of innovation economy companies – and not just tech companies. More than 70 percent of job growth since the launch of the district in 2010 has been in non-tech industries, including 11 percent in education and nonprofits; 21 percent in advertising, design and other creative industries; and 16 percent in life sciences (City of Boston, "Boston's Innovation District."). Furthermore, 25 percent of new companies in the Innovation District are startups, defined as ten people or less (City of Boston, "Boston's Innovation District.").

As rents rise in the Innovation District, though, this share of new startup companies is likely to decrease, as only more established firms will be able to afford the district. It is exactly the same dilemma Kendall Square has faced over the past fifteen years, and part of the impetus behind creating the Innovation District in the first place as firms were being priced out of Kendall Square.

Where in Boston will these early-stage innovative firms locate, and why does it matter?

The Innovation Economy's Relevance

Before discussing the problems and opportunities around rising rents, it is important to first understand why we should care about the innovation economy in the first place. Jeffrey Leiden, CEO of Vertex – one of the signature firms to recently locate in the Innovation District – raises an important point about Boston's innovation economy: "While this ecosystem has created thousands of jobs and dozens of new medicines and technologies that have changed peoples' lives, its future is not guaranteed as other regions attempt to capture a piece of our success" (Leiden, 2013). Simply because Boston has had success over the past half-century in attracting

innovative firms and creating a strong entrepreneurial environment does not guarantee future success. One need look no further than Detroit, once considered a hub of innovative activity around the automobile sector, to see that cities can lose their competitive advantage over time, particularly as new technologies and global economic conditions develop. This issue is explained even more concretely by Acs et al. (2008):

> [S]uccessful entrepreneurial clusters tend to develop new sets of problems that, left unaddressed or inadequately addressed, can threaten their continued growth. As more firms and employees are attracted to a given locale, it is possible, if not likely, that traffic congestion, pollution, and rapidly increasing real estate prices, among other issues, will follow. Eventually, successful locations can price themselves out of the market, with prices and wages so high that productive activity, including entrepreneurial activity, moves elsewhere (p. 5).

Between 1993 and 1996 – still in the early days of the current technology age – fast growth entrepreneurial firms created nearly two-thirds of all new jobs in the United States, while these firms comprised only 5 - 15 percent of all U.S. businesses (National Commission on Entrepreneurship, 2000). More importantly, recent research by Enrico Moretti finds that this does not even account for most of the economic gains resulting from the innovation economy: for every high-tech job in a city, five more jobs are created outside of that sector, not only in business services like law and accounting, but also in local service occupations such as nurses, teachers, hairdressers, carpenters, and waiters (Moretti, 2012).

Rising Rents

Scott Kirsner and Paul McMorrow, Boston Globe columnists who have written frequently on Boston's innovation economy, put the issues in Kendall Square and the Innovation District in perspective. "All of the buildings going up in Kendall Square are dedicated either to big pharmaceutical companies such as Pfizer and Novartis, or to academic research labs like the Broad Institute" (Kirsner, 2013). Aside from the Cambridge Innovation Center, which rents individual desks out to micro-scale entrepreneurs, Kendall Square is growing increasingly inhospitable to startups, especially those with 10 or less employees; Cambridge's new law that 5

percent of office space must be designated "innovation space" only applies to new construction, and is unlikely to have a significant impact overall (Kirsner, 2013). The average office rent (all classes) in Kendall Square now stands at $51 per square foot, and is the most expensive commercial real estate in the region (Cushman and Wakefield, Cambridge, 2013).

In the Innovation District, the average office rent (all classes) has risen from $26 per square foot in 2010 – when the branded district was launched – to $38 per square foot at year-end 2013, an increase of 50 percent (Cushman and Wakefield, Boston, 2010; Cushman and Wakefield, Boston, 2013). According to McMorrow, "small startups that fuel the region's innovation economy could never claim the new office towers rising above acres of parking lots in South Boston. Lawyers and corporate accountants are the only ones who can stomach the enormous rents" (McMorrow, 2013).

Simple supply and demand indicates that there is not enough space in these two districts to meet the growing cadre of entrepreneurs and innovation economy firms in Boston. Of course, these firms could seek more affordable space outside of Kendall Square and the Innovation District on their own. Over time, this may result in clusters of innovation firms in other Boston neighborhoods, although such clustering is not guaranteed, and could take decades to develop. The Innovation District model has demonstrated potential in speeding up the process of innovation clustering, not through the government picking specific firms as winners or losers, but in "setting the table" for a neighborhood to attract innovative firms across many industrial sectors.

Clusters, a concept popularized by Michael Porter of the Harvard Business School in the 1990s, are "geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions...in a particular field that compete but also cooperate," (Porter, 2000, p. 15). Rather than having firms spread across a wide geographic range, clusters create advantages by providing mutual benefits and synergies between

firms, including knowledge sharing, mutual access to skilled labor pools, or utilization of shared public goods (Muro and Katz, 2011). For policymakers, targeting clusters allows government to realize scale in policy interventions:

> Cluster policies for entrepreneurship and innovation occupy a very distinct place in this scheme. They are narrowly place-specific, favoring a very specific locale, such as Boston's Innovation District. This geographic concentration is justified both as a tool for generating positive externalities and as a means of getting the most out of scarce infrastructure dollars. They are also oriented towards either specific industrial sectors (life science, computers) or more generally towards start-ups. They are not usually firm-specific, largely because start-ups are too small to address on a firm-by-firm basis, but also because the proponents of these policies often share economists' skepticism about the ability to pick winning firms, even though they believe in the ability to pick winning sectors (Chatterji et al., 2013, p. 6).

While much of the literature and policy around clusters has been at a regional scale, the Innovation District has co-opted the concept at the neighborhood level, with many people now calling for similar initiatives in other Boston neighborhoods to address the supply problem in the Innovation District and Kendall Square, and to capitalize on the model's economic development potential.

Calls for Creating Innovation Hubs in Other Neighborhoods

Boston's newly elected mayor, Marty Walsh, along with a number of other candidates in the 2013 mayoral election, have indicated a desire to augment the city's role in promoting entrepreneurship and innovation throughout the city. Walsh's platform included goals to convert unused city-owned space throughout the city into business incubators and accelerators, along with an "Innovation Advocate" at city hall representing the interests of growing companies (Campaign for Marty Walsh, "Economic Development").

Other candidates were even more explicit in their desire to diffuse the innovation economy into other Boston neighborhoods. John Connolly's jobs plan led with the goals of "support[ing] Boston's innovation ecosystem" and "address[ing] the high commercial rents that make it difficult for startups to find affordable space," suggesting that the City create transit-oriented innovation hubs in Boston's other neighborhoods (Campaign for John Connolly.

"Boston Jobs Plan"). Bill Walczak, another candidate echoed this idea in an interview with WBUR: "Mayor [Thomas] Menino had this brilliant idea called the South Boston Innovation District. We need one in East Boston where Suffolk Downs is, and we also need to build one in Allston here with the collaboration of Harvard. I think we also need one in Roxbury, near Dudley Square" (Pfeiffer and Jolicoeur, 2013).

Other commentators have discussed potential diffusion as well. McMorrow in particular has stated a belief that Allston should be Boston's next innovation cluster, with the neighborhood's young, creative residents, proximity to Harvard, and new incubator space (McMorrow, 2013). Kirsner describes the clustering that is already starting to take place in Downtown Crossing, citing rents that can be half that of Kendall Square, more flexible lease options, and central transit access (Kirsner, 2013). Many of these advantages, however, can be found in most Boston neighborhoods; unfortunately, there are only so many resources at the City's disposal to target any one neighborhood, or a handful of neighborhoods, to promote innovation clustering.

The Role for the City of Boston

The Innovation District has been a unique example; while its growth has been a result of private sector development, the City of Boston really took a leadership role in identifying the area as a potential innovation district and creating policies and a framework to encourage private sector growth in a time frame of just a few years. The development of Kendall Square, on the other hand, was more of a slow, incremental process that began with extensive federal research funding in the post-World War II period, picking up steam in the 1980s and 1990s to become the world-class innovation center we know today (Kim, 2013).

Looking at local government's role in the fostering of the next innovation districts, the City of Boston could tack either way. Because of the neighborhood-level knowledge that would be required to roll out a multi-node innovation district, though, it may also be useful to look at

another framework that already exists in each of Boston's neighborhoods: the Boston Main Streets program, created in 1995 as the first urban Main Street programs in the United States (City of Boston, "About Boston Main Streets"). Prior to 1995, the National Trust for Historic Preservation's Main Street model had been a tool for commercial district revitalization in small and medium-sized towns throughout the U.S., utilizing its four-point model of commercial district organization, promotion, design and economic restructuring (National Trust for Historic Preservation, "The Main Street Four-Point Approach").

Today, the Boston Main Streets program operates in twenty districts throughout the city. Each of the twenty Main Streets program operates as an independent 501(c)(3) nonprofit organization, working with district businesses to improve facades, host promotional events like festivals and road races, and create attractive environments for consumers and new business (City of Boston, "About Boston Main Streets"). While each organization is independent, each receives significant funding from the City of Boston – covering salaries and office rent – as well as technical and operations assistance from the City's Department of Neighborhood Development. It is a unique public-private partnership that has three apparent comparative advantages related to the fostering of multi-nodal innovation districts: 1) they currently engage in many of the networking and promotional activities that have appear to be important for innovation districts 2) there is a connection between the 20 organizations that could allow for wider coordination than between independent community based organizations 3) at the same time, each organization has a level of autonomy to avoid a (potential) top-down, one-size fits all approach from City Hall.

Research Questions

> Innovation is widely seen as the key to regional economic development, and many cities around the country are seeking to develop economic development strategies that will encourage increased innovation in their area. A crucial foundation for developing such strategies is an understanding of the current state of innovative activity across metropolitan areas (Rosenbloom, 2007, p. 14).

With this statement in mind, along with the host of issues raised in the introduction, this thesis will seek to answer two core research questions:

1. What are the characteristics of an "innovation economy," and what are the intensity and spatial distribution of those characteristics throughout the neighborhoods of Boston?

2. What relationships do Boston Main Streets organizations have with innovation economy businesses and what relationships do they foresee in the future?

Organization

The literature review in Chapter 2 assists in developing the criteria needed to answer these questions, along with developing some key definitions and further elaborating on the importance of the innovation economy in 21st century. Specifically, the literature review examines the following themes:

- Understanding the Innovation Economy
- The Importance of Innovation for Economic Growth
- The Connection Between Innovation and Place
- The Role of Local Government in Fostering Innovation

Chapter 3 details the methodology employed to answer the core research questions. Based on the literature review, I elaborate on methods and criteria to create an inventory of characteristics for each Boston neighborhood to address the first research question. Methodology for answering the second research question consists primarily of interviews with Boston Main Streets organizations' executive directors in select neighborhoods to discuss their current work, current connection with the innovation economy, and thoughts on potential innovation district expansion into their neighborhoods.

Chapter 4 presents and analyzes the findings of innovation economy characteristics for each neighborhood. Chapter 5 presents the analysis of findings from interviews with executive directors of Boston Main Streets organizations. Chapter 6 presents the conclusions of the thesis.

2. Literature Review

2.1 Understanding the Innovation Economy

The term "innovation economy", and similar incarnations "knowledge economy," "creative economy," "information economy," "innovation ecosystem" and others, are often used in media and political discourse without definition; it is taken for granted that these are self-explanatory terms. Entrepreneurship is also a key ingredient in all of these terms, and is also used in certain contexts to fill in for the aforementioned terms, or at least complement them. This lack of definition, however, is likely not an attempt to obscure meaning. Instead, it seems to reflect the variety of interpretations found throughout the literature.

Schumpeter (1934) provides one of the earliest frameworks for innovation itself in his concept of "creative destruction," which can include new goods or marked improvement of existing goods, new methods of production or process, opening of new markets, or new types of administrative organization. While the industries of today's economy making the most use of these concepts are different, the core of innovation today is still focused around production processes and production development, with the ability to "enhance or develop new technology or industry" (Galloway and Robison, 2008). Powell and Snellman (2004) define the knowledge economy as:

> …production and services based on knowledge-intensive activities that contribute to an accelerated pace of technological and scientific advance as well as equally rapid obsolescence. The key components of a knowledge economy include a greater reliance on intellectual capabilities than on physical inputs or natural resources, combined with efforts to integrate improvements in every stage of the production process (p. 201).

These definitions are not relegated to academia, either. The Massachusetts Technology Collaborative, the lead Massachusetts public agency for technology economic development, defines innovation as "the capacity to continuously translate ideas into novel products, processes

and services that create, improve or expand business opportunities" (Massachusetts Technology Collaborative, 2012, p. 25).

The concept of entrepreneurship that goes hand in hand with the innovation economy is similarly wide-ranging, because there are many types of entrepreneurship, from necessity-based, to mundane, to the innovative type focused on here (Low, 2013). In the innovation context, entrepreneurship is not relegated only to starting new businesses, but also applies to "new venture creation and business development in established companies as well" (Brem, 2011, p. 10).

Although the literature tends to use these terms interchangeably, there is a common thread between each that focuses on the primary input of knowledge in the science and professional service industries (Brint, 2001). Powell and Snellman (2004) trace the evolution of the thinking around this "knowledge economy", with a shift from solely looking at science-based industries in the 1960s to acknowledging the growth in professional services and information-rich services like publishing and marketing in the decades since. The knowledge economy and innovation economy do not just apply to industries, but also to occupations – such as physicists, biochemists, engineers, and others that can cut across industries – as it is people, not industries, that drive innovation and technological development (Galloway and Robison, 2008).

To focus these higher-level definitions into more narrow definitions that can be applied in research, researchers have sought to create definitions for the innovation economy using both industrial and occupational frameworks. Cortright and Mayer (2001) look specifically at the high-technology sector of the innovation economy, using the North American Industrial Classification System (NAICS), restricting analysis to firms classified as Computer and Electronic Product Manufacturing (NAICS 334) Software Publishers (NAICS 5112) Information and Data Processing Services (NAICS 514) Computer Systems Design and Related Services (NAICS 5415).

A focus on occupational, rather than industrial, classifications was made popular by Richard Florida in his 2002 book, *The rise of the Creative Class: and how it's transforming work, leisure, community and everyday life*. Using the Bureau of Labor Statistics' Standard Occupational Code (SOC) system, he breaks down occupations into three classes: the Creative Class (another incarnation of the innovation economy), Working Class, and Service Class. He then breaks the Creative Class into two groups: the Super-Creative Core (computer and mathematical occupations; architecture and engineering occupations; life, physical, and social science occupations; education, training, and library occupations; arts, design, entertainment, sports, and media occupations) and the Creative Professionals (management occupations; business and financial operations occupations; legal occupations; healthcare practitioners and technical occupations; high-end sales and sales management).

Others instead use clusters of industries (discussed in more detail later), under the belief that looking at single industries or occupations misses important links. Examples include financial services; information technology; post-secondary education; health care delivery; and diversified industrial manufacturing (Kahn et. al, 2012).

These varied definitions indicate that there is no one approach to defining the innovation economy, but the variety of definitions and focused methodological approaches may actually make for a richer understanding. Enrico Moretti, in his 2012 book *The New Geography of Jobs*, seems to crystallize the range of interpretations into one that gets at the heart of what Boston's Innovation District recognizes:

> The innovation sector includes advanced manufacturing (such as designing iPhones or iPads), information technology, life sciences, medical devices, robotics, new materials, and nanotechnology. But innovation is not limited to high technology. Any job that generates new ideas and new products qualifies. There are entertainment innovators, environmental innovators, even financial innovators (p. 11).

Certainly, new ideas are generated in practically all occupations, but generally researchers are excluding a wide range of occupations. Many of these occupations are in local

services, like restaurants, retail, construction, and others which are really the result of local economic growth rather than drivers of local economic growth. Other exclusions are traditional manufacturing, production, and maintenance occupations. Blue-collar jobs, though, are not the only ones set aside: many white-collar jobs in office and administrative support and community services are similarly set aside.

2.2 The Importance of Innovation for Economic Growth

It is no secret that the United States has experienced significant structural changes in its economy over the past few decades. Traditional heavy manufacturing has declined, and the economy has increasingly been driven by services and consumption. Given this softening of manufacturing, cities have focused their economic development policies on industries that are more human-capital intensive, and have been designing strategies to attract high-tech and innovative development (Sommers, 2003). While some cities probably pursue such strategies in attempts to emulate success elsewhere and because it is the economic development tool du jour, there are three significant reasons identified in the literature why this may actually be sound policy: empirical evidence of the link between entrepreneurship and economic growth; the creation of a positive-sum game; and the high multiplier effect of innovative, particularly high-tech, industries. They are interrelated, but each has important individual impacts.

Using average firm size and self-employment rates as proxies for entrepreneurship across 353 U.S. metropolitan areas between 1977 and 2000, Acs, Glaeser et. al (2008) found two significant correlations. First, as firm size falls (entrepreneurship becomes more frequent), employment grows faster. Second, as the self-employment rate rises, metropolitan employment growth also rises. These proxies could be misleading, though, as self-employment rates and small firm sizes could be capturing small retail or food enterprises, for example, rather than the innovation economy firms previously discussed. Glaeser et. al (2012), however, appear to provide

evidence that this is not the case. Employment gains over the study period were not a result of the infinite replication of small businesses, but rather resulted from initially small firms that grew into large employers. This is a process more typical of innovation economy firms than other types of small-scale firms, such as in retail and food.

This backs up the findings of Birch and Medoff (1994) who found that more than 70% of all new jobs are created by 4% of firms, known as "gazelles." Gazelles are the small firms that were able to rapidly grow to scale, while the other small firms either continued at small-scale and generated modest employment, or couldn't succeed and exited the market. The National Commission on Entrepreneurship (2000) found similar results. New fast growth companies – gazelles – comprised only 5 to 15 percent of all firms in the U.S., but generated two-thirds of new jobs between 1993 and 1996.

In addition to employment, venture capital financing is also used as a metric for innovation economy growth, and has illustrated a similar relationship between the innovation economy and economic growth. Samila and Sorensen (2011) find that the doubling of venture capital activity in a city leads to a one percent increase in employment.

The second strength of the innovation economy, as opposed to the old economic development paradigm of smokestack chasing, is that it can create net new jobs, rather than simply moving firms and jobs from one city to another. "The formation and growth of new firms, especially those built around new products or ways of doing things, wherever this occurs, is clearly a positive sum game, not just for the locality, but for the nation as a whole" (Acs, Glaeser et. al, 2008, p. 2).

Still, Agrawal et al. (2012) find that the most innovative local areas have at least one large innovative firm anchoring the area, amidst many smaller innovative firms. So for neighborhoods looking at entrepreneurship as the core of an economic development strategy, it can be difficult to jump-start without engaging in modern-day smokestack chasing, particularly if

there is no natural innovative anchor firm in the neighborhood. The City of Boston has done this in the Innovation District, luring some firms from Cambridge (and even other parts of Boston) to anchor the neighborhood.

The third strength of the innovation economy, and in this case particularly high-tech firms, is its multiplier effect. Moretti (2012) has found that for every new high-tech sector job in a city, five additional jobs are created outside that sector; in contrast, traditional manufacturing creates 1.6 additional jobs outside that sector, and manufacturing has one of the higher multiplier effects compared to other industries. Furthermore, these five jobs are not only in professional services; in fact, the majority are in local services, such as trades, waiters, hairdressers, etc. (Moretti, 2012). Moretti argues that "the best way for a city or state to generate jobs for less skilled workers is to attract high-tech companies that hire highly skilled ones" (p. 13).

2.3 The Connection Between Innovation and Place

Regional Level

The existence of "agglomeration" forces, an externality that pull businesses together in a particular location have long been acknowledged in the literature (Muro and Katz, 2011). Marshall (1890) noticed that English industrial firms located near each other, and suggested that this was because it allowed them to all benefit from a larger labor market, knowledge spillovers between firms, and proximity to suppliers.

Today, the term "cluster" is used for a group of firms arising from such agglomeration forces. Michael Porter (2000) argues that clusters are more useful than industry categorizations because they "capture important linkages, complementarities, and spillovers in terms of technology, skills, information, marketing, and customer needs that cut across firms and industries" (p. 18). As an example, he cites the medical devices cluster in Massachusetts, which had 400 companies and 39,000 high-paying jobs, but was obscured in traditional reporting by

industry, preventing more targeted and effective government policy at boosting that cluster. Clusters can be defined too broadly – such as simply manufacturing, services, or even "high-tech" – but equating a cluster with just one industry can be equally self-defeating (Porter, 2000).

The idea of knowledge spillovers is one of the key benefits of clusters, and it is particularly important for the innovation economy. Unlike some of the externalities that occurred from traditional manufacturing clusters or agglomerations – related to natural resource availability and lower labor costs – externalities (knowledge spillovers) in the innovation economy are related to "an environment that attracts smart people whose interactions, knowledge exchange, and prior experience subsequently contribute to the regional knowledge stock" (Audretsch, 2012, p. 381). Aharanson et al. (2004) found that Canadian biotechnology firms located in clusters with other firms specializing in similar technology are eight times more innovative, as measured by patent generation.

As Moretti (2012) notes, when looking at successful innovative clusters – whether it's tech in Silicon Valley, entertainment in Los Angeles, or medical research in Raleigh-Durham – it appears in hindsight that the location of industries in these places was inevitable, whether it was because of connection to universities, unique weather and geography, or some other factor. "But," he concludes, "this is not how people saw it before these industries settled in their respective cities" (p. 185). Knowledge spillovers help explain why firms cluster, but do not explain why they cluster where they do. Knowledge spillovers could happen just as easily in Montana's Sun Valley as in Silicon Valley. Mayer (2006) describes a supportive environment that successful innovative regions have developed, where:

> …innovation and knowledge created at the anchor institution is translated into real economic benefits through entrepreneurial actions. This "innovation milieu" consists of specialized business support services, a strong and specialized labor market, quality of life, a strong research infrastructure, capital formation, entrepreneurial environment, and active networking (Mayer, 2006, p. 35).

While many innovative regions do indeed have many of these features, there is significant evidence that any one of these is not necessarily sufficient on its own to encourage the development of an innovation economy; furthermore, there are also some issues around causality. For example, Mayer (2006) holds that the main ingredient in a high-technology or life sciences region is a world-class research university, such as Stanford or MIT, or what he calls a "surrogate university": large innovative firms, government agencies, or private laboratories that can compensate for an absence of a strong university. Many have argued, however, that the university link is tenuous. Acs, Glaeser et al. (2008) cite Seattle as an example: it is home to Microsoft, Amazon, and Starbucks, but the emergence of the innovation economy there had little to do with the University of Washington. Moretti (2012) raises the question of why, when biotech emerged in the 1970s, it didn't cluster in one of the other 187 American cities with a university, or one, like New Haven, with a top biology department at Yale. His research found an answer: the emergence of biotech clusters in Cambridge, the Bay Area, and San Diego was largely attributable to individual star researchers that happened to be located in these places. Much more important than a university, he holds, are the presence of specialized business services and a strong, specialized labor market. Still, Acs, Glaeser et al. (2008) acknowledge that the presence of a university can provide an important pipeline to an innovation hub – it's just that the mere presence of a university is no guarantor of developing such a hub.

Quality of life is another tenuous causal factor. Richard Florida, more than just creating the framework of the Creative Class, argues that a city's quality of life and amenities are a primary attraction in the development of an innovation economy. Moretti (2012), though, provides an example of Berlin, which is considered one of the most interesting and lively cities in Europe, but has double the unemployment of the rest of Germany:

> It is certainly true that cities that have built a solid economic base in the innovation sector are often lively, interesting, and culturally open-minded. However, it is important to distinguish cause from effect. The history of successful innovation clusters suggests that in many cases, cities

> became attractive because they succeeded in building a solid economic base, not vice versa (Moretti, 2012, p. 189).

Concentration of venture capital resources does seem to have an impact, at least in a regional context. Sommers (2003) conducted a study of innovation in five cities throughout Washington State, and found that the near full concentration of venture capital in Seattle made it difficult for other cities in the state to develop strong innovation economies. If the innovation economy is to spread to the rest of the state, Sommers concluded that the centralized assets in Seattle must be replicated elsewhere.

A number of additional factors have an impact on the location decision of entrepreneurs and innovators. Audretsch et al. (2012) highlighted the importance of the local supply of entrepreneurs, with findings that entrepreneurs disproportionately tend to locate in their regions of birth. The local preference can also include entrepreneurs not born in an area, but who have previously worked in an area, resulting from reduced uncertainty and maintenance of networks (Sorensen, 2003).

Chatterji et al. (2013) emphasize that more must be learned about the role of local physical infrastructure (such as roads and internet access) in fostering an innovation economy in the U.S., although a link has been established in developing countries. There is informal evidence, though, that transit plays a role. In a survey conducted by Jones Lang LaSalle, three-quarters of knowledge-based company executives cited public transportation as second only to Internet infrastructure in the site selection process (Bluestone, 2007). Transit actually ranked well ahead of proximity to clients and business support services.

Finer Scale: Innovation Districts and the Inner City

While most research on innovation and clusters has focused analysis at a regional scale, more research – and policy – is beginning to look more closely at where firms locate precisely

within a region, for both the impact on innovation and on those smaller geographical areas themselves.

Aharanson (2004) found that as the distance between firms in a cluster increases, innovative activity tends to decrease. This is not limited, however, to the biotechnology clusters from that study. Arzaghi and Henderson (2008) found that knowledge spillovers for New York City advertising agencies also begin to dissipate as distance between firms increases, and that the tipping point distance can be as small as a few city blocks. Of importance for such a neighborhood-level finding, however, is that the pool of skilled workers is not subject to "distance decay," meaning that a firm's precise location in a regional cluster does not seem to impact its ability to attract workers (Aharanson, 2004).

This neighborhood-level thinking about innovation has recently manifested itself in policy with the development of so-called "innovation districts," a term and approach which the cities of Boston and Barcelona deserve credit for popularizing (Katz and Bradley, 2013).

> Innovation districts reflect a new vision of where innovative firms want to locate, where creative and talented workers want to live and work, and how ideas happen. They embody a different vision from that of industrial districts or science parks of both the physical realm (infrastructure, historic buildings, waterfront locations, urban design, and architecture) and the community environment (affordable housing, social activity, cultural institutions and events). They respect the penchant of leading-edge sectors to practice open innovation and collaborate with networks of firms, universities, and supporting institutions. They provide the physical and social platform for entrepreneurial growth – incubator space, collaborative venues, social networking, product competitions, technical support, and mentoring. They build on the recent expansion of state of the art transit systems in the United States beyond their original footprint in the Northeast, the mid-Atlantic, and Chicago. Innovation districts cast cities and urban suburbia not just as consumer zones of Starbucks and stadiums, restaurants and retail but also as hubs of invention, collaboration, and entrepreneurialism that drive the broader economy. They are both competitive places (respecting the dramatic impact that innovative, traded sectors have on broader metropolitan economies) and cool spaces (reflecting the revaluation of livability, walkability, and authenticity in neighborhood design) (Katz and Bradley, 2013, p. 116).

I include the full definition here because this new hyperlocal expression of the innovation economy is rare in the literature. Released only a few weeks before Katz and Bradley's *The Metropolitan Revolution*, a June 2013 MIT thesis (Kim, 2013) looked at the development of Kendall Square and its implications for future innovation districts, but was explicit in its review

of the literature that "the importance of physical proximity in increasing knowledge spillover, face-to-face conversation, and inter-firm collaboration has only been investigated at a regional scale" (p. 7). Kim suggested the absence of attention given to innovation clusters in dense, urban areas is perhaps due to the fact the regional-scale Silicon Valley was, and still is, viewed as the dominant model of an innovation cluster (Kim, 2013).

Katz and Bradley highlight the fact that Boston's 1,000-acre Innovation District lacks a world-class research university, or at the start of the initiative, even a cluster of entrepreneurial firms. They argue, however, that its strengths include "close proximity and easy transit access to a city with strong assets - renowned universities, high-level human capital, and a growing concentration of life sciences and tech clusters." Without realizing it, they actually conflate the Innovation District's core strengths with those listed by Michael Porter in his seminal work, "The Competitive Advantage of the Inner City," which are:

> ...strategic location, local market demand, integration with regional clusters, and human resources. They sit near congested high-rent areas, major business centers, and transportation and communications nodes. As a result, inner cities can offer a competitive edge to companies that benefit from proximity to downtown business districts, logistical infrastructure, entertainment or tourist centers, and concentrations of companies (Porter, 1995, p. 57).

While the local market demand cited by Porter is often met through economic development tools such as commercial district revitalization, the other three advantages appear well suited for the innovation economy and match up well with Katz and Bradley's observations.

Porter goes on to say that there is a common misperception that low-cost real estate is one of the inner city's main advantages. He argues that real estate costs are often higher in the inner city than in suburban and rural areas. While that may be true, there are numerous recent examples of innovative firms seeking to locate in the city – from Twitter eschewing a Silicon Valley campus to stay in San Francisco, to the Massachusetts' pharmaceutical firm Biogen deciding in 2011 to move back to Kendall Square after having already moved to a suburban Route-128 location just a year before. So, maybe a more appropriate comparison may be real estate prices in

the inner city versus the downtown core, or already established innovation districts, rather than the inner city versus the suburbs.

2.4 The Role of Local Government in Fostering Innovation

The concept of innovation districts and focusing development in inner city neighborhoods raises the issue of what role government can, or should, play. If government is to play a role, the longstanding discussion of "people-based" versus "placed-based" policy arises. Most government programs, particularly at the federal and state level, are people-based strategies, with the goal of providing income or services to a group of individuals (Moretti, 2013). Place-based strategies, on the other hand, focus on a narrow geographic area with public investments, tax incentives, or special regulations (Moretti, 2013).

Although many economists have traditionally been skeptical of place-based policies – arguing that policy should focus on the tax system or transfer programs to assist individuals across geographies (Moretti, 2013) – we have seen that there are some unique benefits in spatial concentration of innovative firms. Furthermore, without an income tax in most cities, city governments are left with many more options for place-based strategies, and in practice, have historically embraced such strategies.

Still, the main takeaway from the literature is that when it comes to fostering innovation, no single strategy is effective on its own.

> The regional foundation for growth-enabling innovation is complex and we should be cautious of single policy solutions that claim to fit all needs. The existing work on entrepreneurship and local innovation does not imply any natural local policy (Chatterji et al., 2013, p. 10-11).

Thus, it will take a multi-pronged approach from local government to foster innovative economies.

Before getting into some of the more immediate policies to foster innovation, it would be remiss not to first emphasize where local government can have the largest long-term impact:

education. Acs, Glaeser et al. (2008) call on local governments to create strong local educational systems as a sound "build it and they will come" strategy for innovation. We have seen that entrepreneurs tend to locate in their region of birth, and clearly increasing the pool of the local population that is well-educated increases the likelihood of developing home-grown entrepreneurs.

Sommers (2003) adds that the provision of infrastructure or support for infrastructure development as another medium to long-term impact that local government can have. Still, huge infrastructure spending upfront isn't a necessity; while it certainly happened on the South Boston Waterfront, with the Big Dig and the Silver Line paving the way for the development of a new neighborhood, other Boston neighborhoods already have this transit and highway access infrastructure in place. Where this is the case, infrastructure support may be more beneficial in other forms. Katz and Muro (2013) identify the City of Boston's assistance in the securing of vacant, prime office free of charge to bring the startup accelerator MassChallenge to the Innovation District. They go on to cite the 22@Barcelona initiative as another example; while the city received European-level public funding to build trams and telecommunications networks, it also significantly altered zoning in the target area, changing the code from industrial, 22a, to services, 22@ (a little branding doesn't hurt) – while increasing allowable density (Muro and Katz, 2013).

One general theme that emerges from the literature is a call for cities to stop trying to create the next Silicon Valley (Isenberg, 2010). Looking at innovation clusters in the U.S., it is difficult to find one that was spawned by a "big push" from local government; Silicon Valley was not the result of a local politician's push (Moretti, 2012). Porter (1995) identifies the Raleigh-Durham Research Triangle as one that was very much a product of state-level planning, but notes that Boston's Route 128 did not arise as a result of any cohesive government vision (although it did benefit from federal research funds).

Isenberg (2010) calls for the shaping of local innovation ecosystems around local conditions, and according to Chatterji et al. (2013), it is possible that government can help in developing clusters, primarily through coordination. According to Porter (2000), though, "Government should reinforce and build on established and emerging clusters rather than attempt to create entirely new ones. New industries and new clusters emerge from established ones as economies develop...There should be some seeds of a cluster that have passed a market test before cluster development efforts are justified" (p. 26). In Sommers' (2003) analysis of Washington State innovation economies, he noted that none of them tried to create completely new technology industries entirely from scratch, but looked to build on comparative advantages and niche strengths already in their economies.

Again, the emergence of the Boston Innovation District seems to fly in the face of some of these suggestions from the literature. As noted earlier, the area had no real entrepreneurial or innovation base; its primary strengths were its access (transit and highway) and lower real estate costs. Still, it built on a few tenets of sound government policy found in the literature. Cortright (2006) concludes that governments should set the table for new industry clusters to emerge in, and then nurture the clusters that end up emerging. Isenberg (2010) takes this a step further in direct relation to the innovation economy:

> Governments would be better advised to remain sector neutral and to unleash rather than harness people's entrepreneurial energies. They should observe which direction entrepreneurs take and "pave the footpath" by gently encouraging supportive economic activity to form around already successful ventures, rather than planning new sidewalks, pouring the concrete, and keeping the entrepreneurs off the grass...One of the drawbacks of popular cluster strategies is that prioritizing sectors serves as a signal to entrepreneurs about where they should seek opportunity: currently, clean tech and mobile applications, for example, are de rigueur. Tomorrow it may be space travel. But you should ask, not tell. It is the entrepreneur's job, not City Hall's or that of a consulting firm, to learn how to identify opportunity, usually where most people think it doesn't exist. In fact, many of the great opportunities defy definition and lie in the creative "inter-sectors": health care and the environment; real estate development and information technology and cleantech; education and mobile communications (Isenberg, 2010, p. 9).

As highlighted by Katz and Bradley (2013) this is exactly the approach that Boston took, focused not on one industry, but on a range of industries with a preponderance of fast-growing, innovation-driven companies.

In this role of setting the table, government can act as a facilitator in identifying and connecting businesses with specialized support services, such as legal, banking, and accounting services (Sommers, 2003). Government can use funds to convene and facilitate network building, and with the presence of a university, create a direct pipeline between the university research and startup formation (Chatterji et al., 2013). Isenberg (2010) also cites the importance of government in marketing a district. Through a comprehensive strategy of "over-celebrating" the successes in interviews, speeches, and government literature, combined with regular media events and highly publicized awards, government can create a brand for the district.

Sometimes, these support services are offered to a smaller subset of firms through business incubators.

> Technology-oriented business incubators can be defined as a property-based initiative assisting technology-oriented businesses to become established and profitable during the start-up phase. They support these businesses by providing shared premises (in one or few locations), business advice and office services (Tamasy, 2007).

Nonprofits and private organizations often run incubators, but municipalities are also frequently found as sponsors (Tamasy, 2007). For these types of innovative firms, it is generally assumed that the firms have the product-related technical expertise, but lack the financial and management expertise needed for full commercialization; the incubators try to fill this void (Sommers, 2003; Tamasy, 2007). Despite a promising 5-year success rate of 87% from the firms in the National Business Incubator Association (Qian et al., 2011), Isenberg (2010) cautions that these firms are less likely to be the "gazelles" that provide larger-scale innovation and employment benefits, and that if poorly conceived, they can become white elephants.

There are a number of government interventions where the results are still unclear. Often, government has tried to step into the role of venture capitalist, providing funding directly to individual firms or incentives to private capital providers; a wide body of research shows that this rarely pans out, as governments do not have the expertise required to identify winners (Acs, Glaeser et al., 2008; Isenberg, 2010; Porter, 2000; Chatterji et al., 2013). Such direct financing often also shields firms from market rigors, which they are not adequately prepared to handle (Isenberg). Tax credits aimed at developing clusters, like providing direct startup funding to firms, has shown little evidence of success; instead, gains are more evident from the adoption of faster and simpler regulatory approval process for businesses (Acs, Glaeser et al, 2008).

At the same time, Zhao and Ziedonis (2012) showed that under a statewide program in Michigan providing direct assistance to start-ups, the recipients were 15-25% more likely to survive after three years than comparable firms that had not received funding. With such results, it is understandable governments would look at such programs, but it doesn't resolve the question of whether the substantial public investment was actually worth that 15-25% advantage. Could the state have achieved better gains in employment or startup creation using that money in other ways?

Some other ways local governments have used this money is by developing entrepreneurship training programs, through community colleges or other organizations. There is no systematic assessment of such programs (Chatterji et al., 2013), though they tend to cater to two different sets of clientele: people who have lost their jobs and are looking at entrepreneurship as a source of income, and people who have an idea in the first place that they want to develop into a business (Acs, Glaeser et al., 2008).

Intuitively, it would seem that the second group would be better positioned to make contributions to the innovation economy, but further research is needed. Chatterji et al. (2013) also point out that it is important to identify the appropriate outcome of entrepreneurship training.

The obvious outcome is that it produces a greater number of entrepreneurs, but an equally useful outcome could be helping "students learn more about their own inclination towards entrepreneurship and chances of success, leading to better-informed career choices, but not necessarily more entrepreneurs" (Chatterji et al., 2013, p. 20). Either way, Acs, Parsons, and Tracy (2008) suggest that local governments should not necessarily focus on boosting entrepreneurship overall, but instead spend their energy and money in fostering high-growth firms.

3. Methodology

Research Question 1: What are the characteristics of an innovation economy, and what are the intensity and spatial distribution of those characteristics throughout the neighborhoods of Boston?

The literature review revealed that there is no single condition or tool that influences the development of innovation economies; instead, it is the interplay of a number of conditions. Mayer (2006) identifies several characteristics that comprise the "innovation milieu" of a place, and there are a number of characteristics identified in the literature beyond what he includes in that framework. Unfortunately, there are a number of causality issues around many of those characteristics.

Therefore, rather than trying to develop a precise algorithm to define a neighborhood's "innovation milieu," I identified four overarching characteristics – which percolated most throughout the literature review – to conduct a more qualitative analysis of each neighborhood's current innovation economy conditions and potential for future innovative activity. Within each category, I identified specific, measurable indicators that could highlight the strength or weakness of that characteristic in a given Boston neighborhood.[1]

Below are the four characteristics, with indicators in parentheses.[2] Fuller descriptions of the methods employed to obtain data can be found in the following paragraphs. Chapter 4

[1] Neighborhoods are defined in this thesis using zip codes. Definitions were taken from the Boston Redevelopment Authority's 2006 *Boston's Neighborhood Business Patterns* report, with a slight modification to split Dorchester into North and South areas. A map of neighborhood boundaries and a table of zip codes in each neighborhood can be found at the start of Chapter 4, which is a modified version of a map I created as a former BRA intern for the forthcoming update to the *Boston's Neighborhood Business Patterns* report.

[2] Some characteristics from the literature review were identified to be relevant to the innovation economy, but are regional in scope, and less tied to an individual neighborhood. These include specialized business services; specialized labor market; and concentration of venture capital resources.

contains two-page profiles for each neighborhood, presenting the inventory of characteristics for each neighborhood in tables, maps, and narrative.[3]

Innovation Economy Characteristics

1. Existing Innovative Business Activity (current neighborhood business mix)
2. Entrepreneurial Environment (new business registrations)
3. Knowledge Spillover (transit proximity to nodes of innovation; presence of universities; presence of business incubators/accelerators/training programs/co-working spaces)
4. Catalyst Opportunities (city-owned commercial real estate)

1. Existing Innovative Business Activity *(2011 Zip Code Business Patterns – U.S. Census Bureau; Industry-Occupation Matrix Data by Occupation – Bureau of Labor Statistics)*.

The literature shows that there is no single definition of innovation economy, and that there have been various ways of measuring it. Still, there is general agreement that it includes both production and services industries based on knowledge-based activities (Powell and Snellman, 2004; Brint, 2001). Cortright and Mayer (2001) created a classification of industries that they considered high-technology, using North American Industry Classification System (NAICS) codes. While this seems like an appropriate approach at first glance, by focusing exclusively on high-technology industries, it seems to present a narrow definition of innovation.

The innovation economy, though, applies not just to industries but also to occupations, as it is people – not industries – that drive innovation and technological development (Galloway and

[3] It is important to note that two additional factors – networking opportunities and average commercial rents – are saved for discussion in Chapter 5. Both data points are collected in the interviews with Main Streets organizations, as reliable data is not available elsewhere.

Robison, 2008). Richard Florida (2002) established a framework for considering occupations in the innovation economy concept. His so-called Creative Class (using the Bureau of Labor Statistics Standard Occupational Classification codes) represents the occupations that Boston's Innovation District targets, and which fall into the innovation economy descriptions found in the literature.

There are two groups that comprise the Creative Class. The first is the Super-Creative Core, which includes people in computer and mathematical occupations; architecture and engineering occupations; life, physical, and social science occupations; education, training, and library occupations; and arts, design, entertainment, sports, and media occupations. The second group is Creative Professionals, which includes people in management occupations; business and financial operations occupations; legal occupations; healthcare practitioners and technical occupations; and high-end sales and sales management.

So, for a given neighborhood, I could use Census data to ascertain how many individuals in that neighborhood fall into each occupation. Unfortunately, because labor in a given region is mobile, this would not reveal anything about the businesses located in that neighborhood; the occupation data would be tied to the individual, who could work anywhere in the metro area (Aharanson, 2004).

Given that the only data about businesses in a given neighborhood is reported by industry, and that the most accurate representation of innovative activity for this analysis rests in occupation classifications, I have sought to blend the two.

The best available, most current data source on neighborhood-level industry data is the Census Bureau's Zip Code Business Patterns (U.S. Census Bureau, 2011). At the zip-code level, it lists the number of firms in each industry by employment-size. For example, a neighborhood could have 5 finance and insurance services firms with 1-4 employees, another 5 firms with 5-9 employees, another 5 firms with 10-19 employees, and so on. To estimate the total number of

employees in a given industry, I multiplied the number of firms in each size class by the midpoint of the class and then summed the totals for each industry. The largest employment size class of 1,000 or more is open-ended, and therefore the midpoint estimation method cannot be used. For these large firms, I utilized the Boston Redevelopment Authority's 2013 Largest Employers report, which contains actual employment figures for all firms with 1,000 or more employees (Boston Redevelopment Authority, "The Largest Employers in the City of Boston").[4] All data was collected at the 6-digit NAICS level. The data only includes private sector (including nonprofit) payrolls; government payrolls are excluded.

To combine this data with BLS occupational data, I utilized a table published by the BLS (Bureau of Labor Statistics, 2012) that lists the percentage of jobs in a given industry that fall into an occupational classification. For example, in the finance and insurance industry, 10.7% of all jobs are classified as management occupations, while 4.2% are classified as computer and mathematical occupations. Using these percentages as weights, I multiplied the industry employment estimates by each occupational weight to arrive the number of employees by occupation in a zip code. I then aggregated data for each occupation into Florida's definitions of Super Creative Core, Creative Professionals, and the combined Creative Class (Table 3-1). Industries were aggregated from the 6-digit NAICS level to the NAICS "super sectors" level, which combines related industries into sectors.

[4] As a former BRA intern I was a contributing author for this report.

Table 3-1: Creative Class Occupations

SOC 2-digit Code	Occupation	Grouping
15	Computer and Mathematical	Super Creative Core
17	Architecture and Engineering	Super Creative Core
19	Life, Physical, and Social Science	Super Creative Core
25	Education, Training, and Library	Super Creative Core
27	Arts, Design, Entertainment, Sports, and Media	Super Creative Core
11	Management	Creative Professionals
13	Business and Financial Operations	Creative Professionals
23	Legal	Creative Professionals
29	Healthcare Practitioners and Technical Operations	Creative Professionals

Sources: Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

For each neighborhood, I present a table listing the number of Creative Class employees by industry, and the percentage of Creative Class employees out of all employees in the neighborhood (which I have termed "Creative Class percentage.") This percentage is used as a proxy for the level of innovation in a neighborhood.

I fully acknowledge that this is not a precise count of Creative Class employees in a given neighborhood, but by looking at the numbers relatively to compare neighborhoods, rather than viewing the results as absolutes, it can be a helpful tool in analyzing existing conditions.

2. Entrepreneurial Environment *(New Business Certificates, 2012 and 2013 – City of Boston Office of the City Clerk)*

Self-employment data is often used as a proxy for entrepreneurial activity in a region, but this presents the same problem as occupational data: the self-employment data is tied to individuals who could work anywhere, rather than to the neighborhood in question. As a place-based proxy for entrepreneurial environment, I used new business certificates issued by the City of Boston in 2012 and 2013 (City of Boston, Office of the City Clerk, 2013). The database of new

business registrations includes the address of the organization, allowing analysis at the neighborhood level. It also provides a description of the type of business.

Retail, restaurants, and other neighborhood services businesses make up a good portion of new businesses in any city; while important, they are not the types of new businesses that are relevant for the analysis in this thesis. So, I coded each new business with a corresponding NAICS code (the database did not use NAICS), and restricted the final inventory to new businesses in the industries shown to have the highest percentages of Creative Class employees from the business patterns analysis. These industries include information services, financial activities, professional and business services, educational services, health care and social assistance, and arts, entertainment, and recreation.

The number of new business certificates are reported by neighborhood and industry.

3. Knowledge Spillover ***(Transit proximity – MBTA, MassGIS, Google Maps; Universities, 2012 – Integrated Postsecondary Education Data; Incubators / Accelerators / Training / Co-Working Spaces – Scott Kirsner (Boston Globe), National Business Incubator Association, Direct Research)***

The concept of knowledge spillover was an important theme in the literature, and I have tried to measure it in a few ways. I first sought to gauge each neighborhood's proximity to existing nodes of innovation in Kendall Square and the Innovation District, looking at transit access and travel times between the profiled neighborhood and those innovative neighborhoods. I also includes transit travel times between the neighborhood and South Station, as it is a primary regional connector. Each neighborhood map (Figures 4-2 through 4-17) contains stations and lines for all MBTA subway and commuter routes (MassGIS). Transit times (using Google Maps) are highlighted between the neighborhood's Main Streets areas (or main commercial areas if

there are no Main Streets organization present) and the Seaport, Kendall Square, and South Station.

I also mapped all colleges and universities in Boston that grant associate's degrees or higher (Integrated Postsecondary Education Data System, 2012). While the literature did not identify nearby universities as an absolute prerequisite for innovative activity, they can certainly be an integral component in a neighborhood's knowledge base. While a university does not need to be precisely within a neighborhood's boundaries to play a role in that neighborhood, examples like MIT/Kendall Square and Harvard/Allston have demonstrated that very near proximity is important.

Finally, business incubators and accelerators, along with training programs, were identified as potential drivers not only of new innovative business activity, but as important places for knowledge sharing. Scott Kirsner, columnist for the Boston Globe, published a listing of many such programs throughout Boston (Kirsner, 2014). I supplemented this base list with data from the National Business Incubator Association and additional internet research (National Business Incubator Association, 2014). For simplicity's sake, these types of organizations will be referred to as innovation support organizations throughout the thesis.

4. Catalyst Opportunities ***(City-owned, developable commercial properties – City of Boston Department of Neighborhood Development)***

As indicated in the literature review, municipalities are increasingly getting involved in creating incubators or providing space to independent incubators. While the City could ostensibly purchase private vacant commercial space for such a venture, it could also look to its extensive inventory of city-owned property. I utilized the current list of city-owned property from the Department of Neighborhood Development (City of Boston, Department of Neighborhood Development, 2013). The DND list only includes properties that the department has deemed

developable. I further narrowed the list by excluding all residential parcels and any others that were not listed as commercial (here defined as office/retail) or industrial. Results are shown in each neighborhood map, and discussed in more detail in the narrative when appropriate.

Question 2: What relationships do Boston Main Streets organizations have with innovation economy businesses and what relationships do they foresee in the future?

While it is possible to get some information on Boston's Main Streets organizations from publications and secondary data sources, qualitative interviews permit much more specific questions about the organizations' current and potential roles in the innovation economy. Because there are 20 Main Streets organizations, I narrowed my initial outreach to the executive directors of Main Streets organizations located in the neighborhoods that ranked in the top half of Creative Class percentage among Boston neighborhoods. I ended up conducting four interviews in all: three with executive directors from this initial outreach, and one from a neighborhood that fell in the bottom half of Creative Class percentages. The interviews, broadly speaking, sought to clarify their interactions with innovative firms, business recruitment strategies, activities to facilitate networking among businesses, what their goals are for their organizations in the next five to ten years, and their interactions with City officials.

There were also a number of considerations around format, length, logistical considerations, data recording, and analysis. Rubin and Rubin (2006) suggest a matrix of interview format types (Table 3-2). One axis considers the broadness or narrowness of an interviewer's questions, while the other considers whether the interview is designed to elicit meaning and understanding, or whether it is designed to describe and portray specific events and processes. The scope of interview questions for this thesis was fairly narrow in scope, while it also focused mainly on events and processes, as opposed to meaning. Under Rubin and Rubin's framework, this suggests a mix of investigative interviewing and evaluation research.

Table 3-2: Interview Framework

	Narrowly Focused Scope	**In-Between**	**Broadly Focused Scope**
Focused Mainly on Meanings and Frameworks	Concept clarification	Theory elaboration	Ethnographic interpretation
In-Between	Exit interview	Oral histories Organizational culture	Life history
Focused Mainly on Events and Processes	Investigative interviewing	Action research Evaluation research	Elaborated case studies

Source: Rubin, H. and Rubin, I., *Qualitative Interviewing: The Art of Hearing Data*.

In terms of interview length, Seidman (2006) suggests a format of three 90-minute interviews for each participant, with one focused on life history, one on the details of experience, and one for reflections on the meaning of the experience. Because these interviews were focused exclusively on participants' activities in their professional role, the focus of the interviews was on details of experience, with some reflection on the impact of those experiences. This would indicate about 90 minutes would be appropriate, although Weiss (1994) suggests one hour may be sufficient. I targeted the one-hour mark for each interview.

Because I am currently living outside Massachusetts, all interviews had to be conducted via phone. Three of the four interviews were recorded, as that appears to be the most agreed on way for catching any nuances and specific details in participants' answers (Weiss, 1994; Seidman, 2006).[5] Because I do not have an excessive number of participants and targeted just a one-hour session with each, I transcribed the recording from each interview for a fuller analysis. Chapter 5 provides an issue-focused analysis (Weiss, 1994), describing what has been learned from all the participants on a range of issues, rather than presenting the results for each participant individually.[6]

[5] One interview was not recorded due to technical issues.

[6] The study was granted exempt status by the Tufts Institutional Review Board (Appendix A). All interview questions (Appendix B) were provided to the IRB. Participants were contacted via email and provided with the interview questions beforehand, along with a consent form outlining the parameters of the study and that their responses would be recorded and attributable to them in the final thesis.

4. Innovation Economy Characteristics in Boston's Neighborhoods

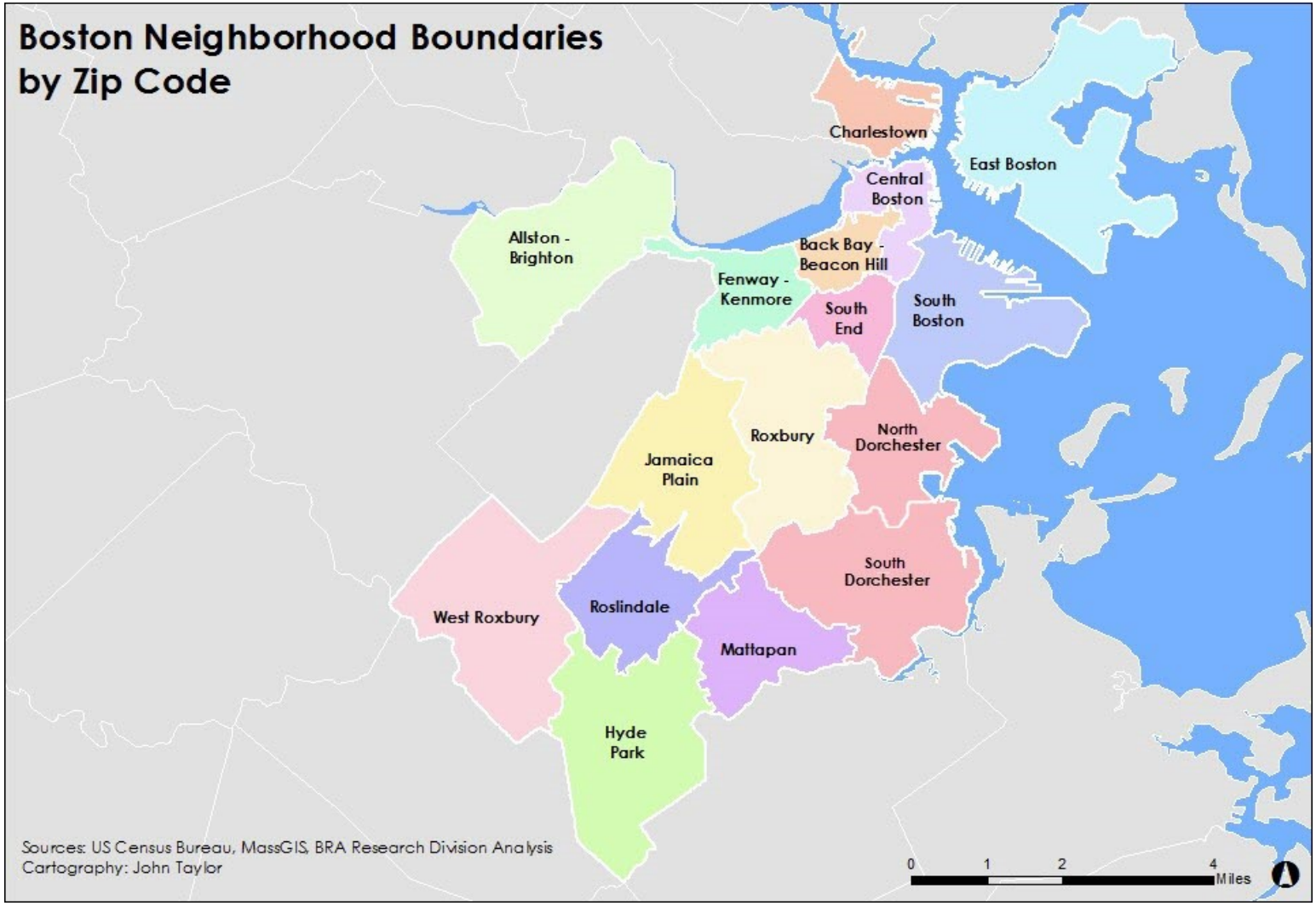
4.1 Overview

Before analyzing each neighborhood individually, it is helpful to provide city-wide context for the findings.[7] Boston is home to 31 colleges and universities, two of which – Harvard University and Boston University – have campuses in multiple neighborhoods. 10 out of 16 neighborhoods have at least one college, although the heaviest concentration is in Fenway/Kenmore, where 14 institutions are located. The city is also home to a total of 20 business incubators, accelerators, training programs, and co-working spaces (innovation support organizations,) many of which have been founded just in the past few years. These organizations are represented in half of Boston's neighborhoods, with the highest concentration (8) in Central Boston.

In 2012 and 2013, more than 4,500 new business certificates were filed with the Office of the City Clerk. Of these, 907 were in the innovation-rich industries of information services, financial activities, professional and business services, educational services, health care and social assistance, and arts, entertainment, and recreation. More than a third of these businesses were located in Central Boston and Back Bay/Beacon Hill, with South Boston, Roxbury, and Allston-Brighton rounding out the top five neighborhoods, respectively (Table 4-1).

[7] See Figure 4-1 on the following page for neighborhood map.

Figure 4-1: Boston Neighborhood Boundaries



Sources: U.S. Census Bureau; MassGIS; Boston Redevelopment Authority Research Division Analysis

Table 4-1: New Innovative Business Registrations in Boston, 2012 and 2013

Neighborhood	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	**Totals**
Allston-Brighton	1	10	28	3	0	16	**58**
Back Bay/Beacon Hill	6	67	66	0	10	7	**156**
Central Boston	6	107	101	5	12	10	**241**
Charlestow n	1	17	6	0	2	1	**27**
North Dorchester	1	10	10	0	1	6	**28**
South Dorchester	8	13	18	0	1	3	**43**
East Boston	4	0	9	1	3	6	**23**
Fenw ay/Kenmore	0	3	9	1	1	2	**16**
Hyde Park	1	8	17	2	4	7	**39**
Jamaica Plain	5	9	27	1	4	7	**53**
Mattapan	0	4	4	0	1	4	**13**
Roslindale	2	3	10	0	2	9	**26**
Roxbury	3	29	19	3	0	8	**62**
South Boston	2	27	31	0	5	8	**73**
South End	2	1	19	0	3	4	**29**
West Roxbury	0	3	8	2	3	4	**20**
Totals	**42**	**311**	**382**	**18**	**52**	**102**	**907**

Source: City of Boston, Office of the City Clerk

The City of Boston owns 85 commercial parcels that are suitable for development – a mix of vacant lots and parcels with existing buildings – along with 6 developable industrial parcels. These properties are concentrated primarily in Boston's outer neighborhoods, with the highest share in Mattapan.

Utilizing the methodology described in Chapter 3, I have identified that nearly 40% of Boston's employees are among the Creative Class, with 11% in Super Creative Core occupations (computer and mathematical occupations; architecture and engineering occupations; life, physical, and social science occupations; education, training, and library occupations; and arts, design, entertainment, sports, and media occupations) and 28% in Creative Professional occupations (management; business and financial operations; legal; and healthcare practitioners and technical).

Table 4-2 highlights the total Creative Class in each neighborhood. To put the numbers in context, the data is benchmarked against Kendall Square, Cambridge, recognized as one of the

nation's most innovative neighborhoods. Nearly 60% of Kendall Square employees are in the Creative Class. In comparison, Boston has one neighborhood with a Creative Class above 50% of neighborhood employment (Fenway/Kenmore), one above 40% (Central Boston), and two just shy of 40% (the South End and South Boston).

Using the results in Table 4-2, Table 4-3 ranks each neighborhood compared to other neighborhoods in Boston in a range of categories. Unlike Kendall Square, where the Creative Class is dominated by the professional and business services sector (home to a large percentage of high technology firms), many of Boston's neighborhoods are dominated by a Creative Class driven by health care and social assistance.

As will be seen in the neighborhood profiles, the industry shares of the Creative Class differ greatly from neighborhood to neighborhood in Boston, as do the proportions of Super Creative Core and Creative Professional employees. The neighborhood profiles provide further analysis of the makeup of the Creative Class.

Table 4-2: Creative Class, Boston and Kendall Square, Cambridge

	Kendall Square, Cambridge	Allston-Brighton	Back Bay/Beacon Hill	Central Boston	Charlestown	North Dorchester	South Dorchester	East Boston	Fenway/Kenmore	Hyde Park	Jamaica Plain	Mattapan	Roslindale	Roxbury	South Boston	South End	West Roxbury	BOSTON TOTALS	% of Neighborhood Employees	% of Neighborhood Creative Class Employees
Neighborhood Firms	475	1,232	3,310	4,688	424	423	944	708	1,181	413	582	218	393	712	1,383	755	468	17,834	-	-
% of Boston Firms	-	*6.9%*	*18.6%*	*26.3%*	*2.4%*	*2.4%*	*5.3%*	*4.0%*	*6.6%*	*2.3%*	*3.3%*	*1.2%*	*2.2%*	*4.0%*	*7.8%*	*4.2%*	*2.6%*	*100.0%*		
Neighborhood Employees	20,200	24,088	92,754	170,481	7,760	9,123	12,557	19,065	103,848	3,843	11,961	1,949	4,980	11,524	36,291	19,851	7,238	537,313	-	-
% of Boston Employees	-	*4.5%*	*17.3%*	*31.7%*	*1.4%*	*1.7%*	*2.3%*	*3.5%*	*19.3%*	*0.7%*	*2.2%*	*0.4%*	*0.9%*	*2.1%*	*6.8%*	*3.7%*	*1.3%*	*100.0%*		
Creative Class	**11,967**	**7,539**	**33,419**	**71,348**	**2,342**	**2,824**	**3,341**	**2,303**	**53,239**	**758**	**4,257**	**399**	**1,508**	**3,088**	**14,136**	**7,823**	**1,729**	**210,053**	**39.1%**	**-**
% of Neighborhood Employees	*59.2%*	*31.3%*	*36.0%*	*41.9%*	*30.2%*	*31.0%*	*26.6%*	*12.1%*	*51.3%*	*19.7%*	*35.6%*	*20.5%*	*30.3%*	*26.8%*	*39.0%*	*39.4%*	*23.9%*	-	-	-
Super Creative Core	7,305	2,654	11,202	14,668	863	1,438	985	551	15,727	284	862	84	321	870	5,387	2,945	423	59,264	11.0%	28.2%
% of Neighborhood Employees	*36.2%*	*11.0%*	*12.1%*	*8.6%*	*11.1%*	*15.8%*	*7.8%*	*2.9%*	*15.1%*	*7.4%*	*7.2%*	*4.3%*	*6.5%*	*7.5%*	*14.8%*	*14.8%*	*5.8%*	-	-	-
Creative Professionals	4,662	4,885	22,217	56,680	1,479	1,386	2,356	1,752	37,513	474	3,395	315	1,187	2,218	8,749	4,878	1,306	150,788	28.1%	71.8%
% of Neighborhood Employees	*23.1%*	*20.3%*	*24.0%*	*33.2%*	*19.1%*	*15.2%*	*18.8%*	*9.2%*	*36.1%*	*12.3%*	*28.4%*	*16.1%*	*23.8%*	*19.2%*	*24.1%*	*24.6%*	*18.0%*	-	-	-

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

Table 4-3: Neighborhood Rankings, Ordered by Creative Class Percentage

	Fenway/Kenmore	Central Boston	South End	South Boston	Back Bay/Beacon Hill	Jamaica Plain	Allston-Brighton	North Dorchester	Roslindale	Charlestown	Roxbury	South Dorchester	West Roxbury	Mattapan	Hyde Park	East Boston
Neighborhood Establishments	5	1	7	3	2	10	4	13	15	12	8	6	11	16	14	9
% of Boston Establishments	5	1	7	3	2	10	4	13	15	12	8	6	11	16	14	9
Neighborhood Employees	2	1	6	4	3	9	5	11	14	12	10	8	13	16	15	7
% of Boston Employees	2	1	6	4	3	9	5	11	14	12	10	8	13	16	15	7
Creative Class	2	1	5	4	3	7	6	10	14	11	9	8	13	16	15	12
% of Neighborhood Employees	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Super Creative Core	1	2	5	4	3	11	6	7	14	10	9	8	13	16	15	12
% of Neighborhood Employees	2	8	4	3	5	12	7	1	13	6	10	9	14	15	11	16
Creative Professionals	2	1	6	4	3	7	5	12	14	11	9	8	13	16	15	10
% of Neighborhood Employees	1	2	4	5	6	3	8	14	7	10	9	11	12	13	15	16

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

4.2 Neighborhood Profiles

With a framework in place to identify neighborhood characteristics related to the innovation economy, the remainder of this chapter presents the spatial distribution of those characteristics for each Boston neighborhood. For the purposes of this analysis, neighborhood boundaries are delineated using zip codes, as that is the smallest geography level for which business pattern data is available.[8] When referring to the "Creative Class percentage" in a neighborhood, it is the number of neighborhood employees in Creative Class occupations divided by the total number of neighborhood employees.

Table 4-4: Neighborhood Definitions, by Zip Code

Neighborhood	Zip Codes
Allston-Brighton	02134, 02135, 02163
Back Bay/Beacon Hill	02108, 02116, 02117, 02123, 02133, 02199, 02217
Central Boston	02109, 02110, 02111, 02112, 02113, 02114, 02196, 02201, 02203, 02205, 02211, 02212, 02222
Charlestown	02129
North Dorchester	02125
South Dorchester	02122, 02124
East Boston	02128, 02228
Fenway/Kenmore	02115, 02215
Hyde Park	02136, 02137
Jamaica Plain	02130
Mattapan	02126
Roslindale	02131
Roxbury	02119, 02120, 02121
South Boston	02127, 02210
South End	02118
West Roxbury	02132

Source: Boston Redevelopment Authority (modified with splitting of Dorchester)

[8] See Figure 4-1 for a map of these neighborhood boundaries. These neighborhood definitions follow the definitions used by the Boston Redevelopment Authority in its Neighborhood Business Patterns report as described in Chapter 3; they are not, however, the official Boston Redevelopment Authority planning district boundaries, and do not represent any official definition used by the City of Boston, or any other group.

Allston-Brighton

Figure 4-2: Allston-Brighton Neighborhood Map

Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

Allston-Brighton's Creative Class percentage ranks seventh among Boston neighborhoods at 31.3%. (Table 4-5). Its most well-represented industry is health care and social assistance, but the high percentage in the manufacturing sector is of particular interest. This is an outlier in Boston, driven by the Genzyme pharmaceutical plant; it is an example of the potential role for advanced manufacturing in the innovation economy. In 2012 and 2013, Allston-Brighton had the fifth-highest number of new business registrations, with 58 (Table 4-1). The neighborhood has two significant university anchors in Harvard University – with the Business School, Innovation Lab, and additional expansion along Western Avenue – and Boston College's presence on the Brighton-Brookline-Newton border (Figure 4-2). Transit is generally accessible, but slow. Development of the forthcoming Boston Landing commuter rail station in Brighton is expected provide much faster access to South Station and the Innovation District.

Table 4-5: Allston-Brighton Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of Allston-Brighton Employees**	**% of Allston-Brighton Creative Class Employees**
Allston-Brighton Firms	1	72	19	215	34	35	126	194	29	153	24	202	128	1,232	-	-
% of Allston-Brighton Firms	*0.1%*	*5.8%*	*1.5%*	*17.5%*	*2.8%*	*2.8%*	*10.2%*	*15.7%*	*2.4%*	*12.4%*	*1.9%*	*16.4%*	*10.4%*	*100%*		
Allston-Brighton Employees	2	576	2,226	3,612	527	1,014	883	4,420	719	6,440	384	2,521	762	24,088	100.0%	-
% of Allston-Brighton Employees	*0.0%*	*2.4%*	*9.2%*	*15.0%*	*2.2%*	*4.2%*	*3.7%*	*18.4%*	*3.0%*	*26.7%*	*1.6%*	*10.5%*	*3.2%*	*100%*		
Creative Class	**1**	**71**	**973**	**434**	**20**	**710**	**207**	**1,269**	**524**	**3,042**	**55**	**79**	**156**	**7,539**	**31.3%**	**100.0%**
% of Creative Class Employees	*0.0%*	*0.9%*	*12.9%*	*5.8%*	*0.3%*	*9.4%*	*2.8%*	*16.8%*	*6.9%*	*40.3%*	*0.7%*	*1.0%*	*2.1%*	*100%*		
Super Creative Core	0	9	554	95	1	597	18	589	458	250	28	6	48	2,654	11.0%	35.2%
% of Super Creative Core	*0.0%*	*0.4%*	*20.9%*	*3.6%*	*0.0%*	*22.5%*	*0.7%*	*22.2%*	*17.3%*	*9.4%*	*1.1%*	*0.2%*	*1.8%*	*100%*		
Creative Professionals	0	61	418	339	19	113	190	680	66	2,791	27	73	108	4,885	20.3%	64.8%
% of Creative Professionals	*0.0%*	*1.3%*	*8.6%*	*6.9%*	*0.4%*	*2.3%*	*3.9%*	*13.9%*	*1.3%*	*57.1%*	*0.5%*	*1.5%*	*2.2%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

Back Bay/Beacon Hill

Figure 4-3: Back Bay/Beacon Hill Neighborhood Map

Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

As the second CBD along with Central Boston, Back Bay/Beacon Hill is a center for financial activities and professional and business services. These sectors are a significant driver of the neighborhood's 36.0% Creative Class percentage (Table 4-6). Unlike Central Boston, though, Back Bay/Beacon Hill derives a significant percentage of its Creative Class from the educational services sector, buoyed by the presence of Suffolk University, Emerson College, and the New England School of Law. Its health care and social assistance innovative employment, however, is just 25% of the level of Central Boston. Back Bay/Beacon Hill has a strong network of innovation support organizations, with a diverse range of organizations including the Center for Women and Enterprise that provides an alternative model to the city's tech-focused organizations. 158 new business registrations were filed in the neighborhood in 2012 and 2013, bolstered by its strength in professional and business services and financial activities (Table 4-1).

Table 4-6: Back Bay/Beacon Hill Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of Back Bay/Beacon Hill Employees**	**% of Back Bay/Beacon Hill Creative Class Employees**
Back Bay/Beacon Hill Firms	2	17	21	566	10	114	602	900	66	176	76	320	440	3,310	-	-
% of Back Bay/Beacon Hill Firms	*0.1%*	*0.5%*	*0.6%*	*17.1%*	*0.3%*	*3.4%*	*18.2%*	*27.2%*	*2.0%*	*5.3%*	*2.3%*	*9.7%*	*13.3%*	*100%*		
Back Bay/Beacon Hill Employees	4	403	146	7,186	291	2,637	22,792	29,174	4,847	4,852	1,860	13,634	4,928	92,754	100.0%	-
% of Back Bay/Beacon Hill Employees	*0.0%*	*0.4%*	*0.2%*	*7.7%*	*0.3%*	*2.8%*	*24.6%*	*31.5%*	*5.2%*	*5.2%*	*2.0%*	*14.7%*	*5.3%*	*100%*		
Creative Class	**1**	**57**	**30**	**603**	**39**	**1,673**	**9,926**	**13,797**	**3,334**	**1,490**	**604**	**547**	**1,317**	**33,419**	**36.0%**	**100.0%**
% of Creative Class Employees	*0.0%*	*0.2%*	*0.1%*	*1.8%*	*0.1%*	*5.0%*	*29.7%*	*41.3%*	*10.0%*	*4.5%*	*1.8%*	*1.6%*	*3.9%*	*100%*		
Super Creative Core	0	5	15	168	17	1,186	1,548	4,471	2,581	298	466	55	391	11,202	12.1%	33.5%
% of Super Creative Core	*0.0%*	*0.0%*	*0.1%*	*1.5%*	*0.2%*	*10.6%*	*13.8%*	*39.9%*	*23.0%*	*2.7%*	*4.2%*	*0.5%*	*3.5%*	*100%*		
Creative Professionals	1	51	15	435	22	487	8,379	9,326	753	1,192	139	492	926	22,217	24.0%	66.5%
% of Creative Professionals	*0.0%*	*0.2%*	*0.1%*	*2.0%*	*0.1%*	*2.2%*	*37.7%*	*42.0%*	*3.4%*	*5.4%*	*0.6%*	*2.2%*	*4.2%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

Central Boston

Figure 4-4: Central Boston Neighborhood Map

Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

As one of the city's two traditional CBDs, a preponderance of firms in city's financial activities and professional and business services sector are clustered there. Those two industries, plus the significant health care and social assistance sector anchored by Massachusetts General Hospital, drive the high Creative Class percentage, which at 41.9% (Table 4-7) is the second-highest in the city behind Fenway/Kenmore. Because of its broad-based employment profile, however, the neighborhood's Super Creative Core percentage is average among neighborhoods, although the absolute number of these employees is the city's second-highest. Central Boston has the best entrepreneurial environment in the city: it leads the city with 8 innovation support organizations and the highest number of new innovative business registrations at 241 (Table 4-1). Transit access and proximity is strong, with a 16-minute travel time between the neighborhood's one Main Streets area – Chinatown – and the Innovation District (Figure 4-4).

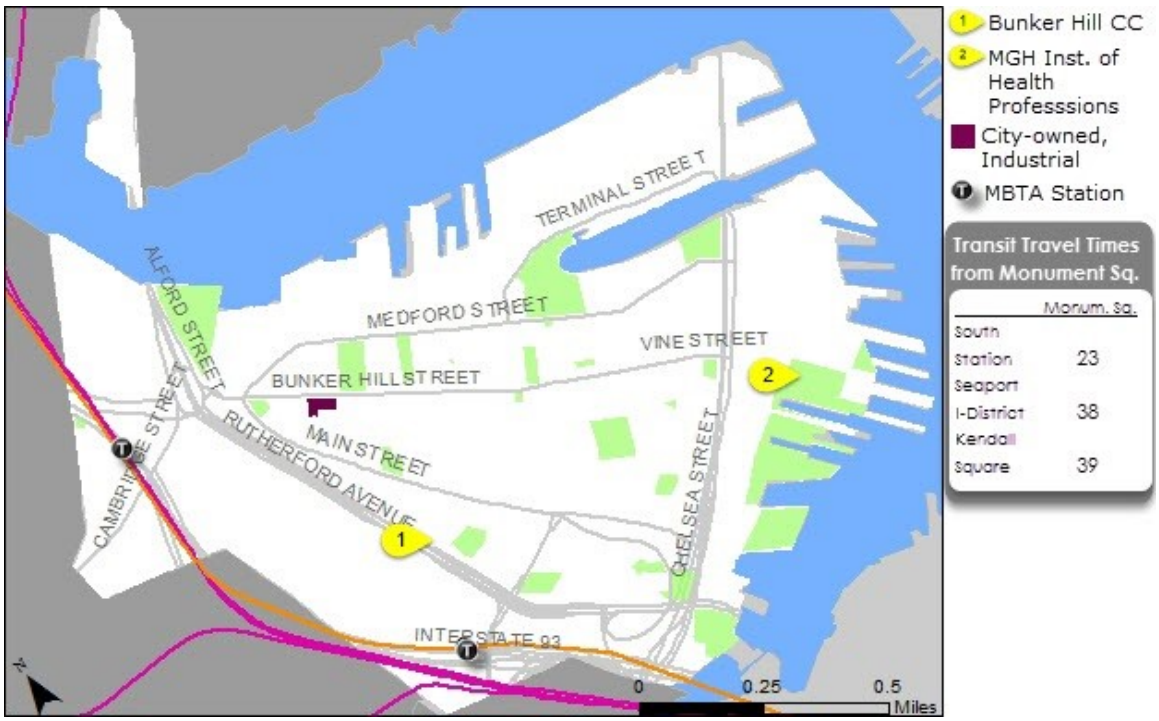
Table 4-7: Central Boston Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of Central Boston Employees**	**% of Central Boston Creative Class Employees**
Central Boston Firms	2	53	46	411	41	168	1,163	1,514	58	254	51	512	415	4,688	-	-
% of Central Boston Firms	*0.0%*	*1.1%*	*1.0%*	*8.8%*	*0.9%*	*3.6%*	*24.8%*	*32.3%*	*1.2%*	*5.4%*	*1.1%*	*10.9%*	*8.9%*	*100%*		
Central Boston Employees	15	599	349	4,678	2,877	4,893	57,998	42,361	2,869	35,889	3,075	11,187	3,693	170,481	100.0%	-
% of Central Boston Employees	*0.0%*	*0.4%*	*0.2%*	*2.7%*	*1.7%*	*2.9%*	*34.0%*	*24.8%*	*1.7%*	*21.1%*	*1.8%*	*6.6%*	*2.2%*	*100%*		
Creative Class	**3**	**115**	**38**	**626**	**184**	**2,515**	**24,961**	**17,801**	**1,998**	**20,628**	**950**	**388**	**1,140**	**71,348**	**41.9%**	**100.0%**
% of Creative Class Employees	*0.0%*	*0.2%*	*0.1%*	*0.9%*	*0.3%*	*3.5%*	*35.0%*	*24.9%*	*2.8%*	*28.9%*	*1.3%*	*0.5%*	*1.6%*	*100%*		
Super Creative Core	1	18	15	201	44	1,741	3,156	5,432	1,590	1,475	637	29	327	14,668	8.6%	20.6%
% of Super Creative Core	*0.0%*	*0.1%*	*0.1%*	*1.4%*	*0.3%*	*11.9%*	*21.5%*	*37.0%*	*10.8%*	*10.1%*	*4.3%*	*0.2%*	*2.2%*	*100%*		
Creative Professionals	2	98	23	425	140	774	21,805	12,369	407	19,152	313	358	813	56,680	33.2%	79.4%
% of Creative Professionals	*0.0%*	*0.2%*	*0.0%*	*0.7%*	*0.2%*	*1.4%*	*38.5%*	*21.8%*	*0.7%*	*33.8%*	*0.6%*	*0.6%*	*1.4%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

Charlestown

Figure 4-5: Charlestown Neighborhood Map



Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

Despite its close physical proximity to Central Boston, Charlestown is a smaller-scale, more residential neighborhood. It's Creative Class – accounting for 30.2% of all neighborhood employees – is dominated by professional and business services (Table 4-8), although a sizeable portion comes from the MGH Charlestown Health Center. The actual percentage is likely even higher because Bunker Hill Community College, a neighborhood anchor, is not counted in the Zip Code Business Patterns statistics due to its nature as a public institution. There is one city-owned industrial parcel, with 47,000 square feet of land and 38,000 square feet of building space (Figure 4-5). While the Orange Line provides direct access between Bunker Hill Community College and downtown, it does not provide direct access to Charlestown's main commercial areas, which rely on bus service.

Table 4-8: Charlestown Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of Charlestown Employees**	**% of Charlestown Creative Class Employees**
Charlestown Firms	0	21	19	55	26	12	42	113	5	28	10	41	52	424	-	-
% of Charlestown Firms	*0.0%*	*5.0%*	*4.5%*	*13.0%*	*6.1%*	*2.8%*	*9.9%*	*26.7%*	*1.2%*	*6.6%*	*2.4%*	*9.7%*	*12.3%*	*100%*		
Charlestown Employees	0	270	310	894	631	154	615	2,296	40	1,413	109	629	400	7,760	100.0%	-
% of Charlestown Employees	*0.0%*	*3.5%*	*4.0%*	*11.5%*	*8.1%*	*2.0%*	*7.9%*	*29.6%*	*0.5%*	*18.2%*	*1.4%*	*8.1%*	*5.2%*	*100%*		
Creative Class	**0**	**25**	**38**	**102**	**35**	**91**	**272**	**1,209**	**27**	**399**	**20**	**18**	**106**	**2,342**	**30.2%**	**100.0%**
% of Creative Class Employees	*0.0%*	*1.1%*	*1.6%*	*4.3%*	*1.5%*	*3.9%*	*11.6%*	*51.6%*	*1.2%*	*17.0%*	*0.8%*	*0.8%*	*4.5%*	*100%*		
Super Creative Core	0	2	15	22	3	65	51	603	21	34	12	2	32	863	11.1%	36.8%
% of Super Creative Core	*0.0%*	*0.2%*	*1.7%*	*2.6%*	*0.3%*	*7.6%*	*5.9%*	*69.9%*	*2.5%*	*4.0%*	*1.4%*	*0.2%*	*3.7%*	*100%*		
Creative Professionals	0	23	23	79	32	26	222	606	6	364	7	16	74	1,479	19.1%	63.2%
% of Creative Professionals	*0.0%*	*1.6%*	*1.6%*	*5.4%*	*2.2%*	*1.7%*	*15.0%*	*41.0%*	*0.4%*	*24.6%*	*0.5%*	*1.1%*	*5.0%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

North Dorchester

Figure 4-6: North Dorchester Neighborhood Map

Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

North Dorchester lands in the middle of neighborhoods in terms of Creative Class percentage at 31.0% (Table 4-9). Like some other neighborhoods, it derives a substantial number of these employees from large businesses; in this case, the Boston Globe accounts for more than a third of the neighborhood's Creative Class. North Dorchester is also home to UMass Boston, which, as a public institution, is not counted in the Zip Code Business Pattern data. The university is also home to the Venture Development Center, an incubator that works with startups in the life sciences, healthcare and information technology industries. Still, these resources are fairly detached geographically from the rest of the neighborhood. North Dorchester's three Main Streets areas are concentrated in the southwestern portion of the neighborhood, with varying levels of relatively quick, but less frequent, commuter rail transit access (Figure 4-6). Vacant city-owned property is concentrated well outside of these Main Streets areas.

Table 4-9: North Dorchester Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of North Dorchester Employees**	**% of North Dorchester Creative Class Employees**
North Dorchester Firms	0	34	9	91	8	14	47	43	9	46	5	58	59	423	-	-
% of North Dorchester Firms	*0.0%*	*8.0%*	*2.1%*	*21.5%*	*1.9%*	*3.3%*	*11.1%*	*10.2%*	*2.1%*	*10.9%*	*1.2%*	*13.7%*	*13.9%*	*100%*		
North Dorchester Employees	0	390	228	1,252	670	2,317	1,167	301	427	930	15	619	806	9,123	100.0%	-
% of North Dorchester Employees	*0.0%*	*4.3%*	*2.5%*	*13.7%*	*7.3%*	*25.4%*	*12.8%*	*3.3%*	*4.7%*	*10.2%*	*0.2%*	*6.8%*	*8.8%*	*100%*		
Creative Class	**0**	**47**	**67**	**93**	**185**	**1,064**	**337**	**117**	**317**	**341**	**2**	**21**	**233**	**2,824**	**31.0%**	**100.0%**
% of Creative Class Employees	*0.0%*	*1.7%*	*2.4%*	*3.3%*	*6.5%*	*37.7%*	*11.9%*	*4.1%*	*11.2%*	*12.1%*	*0.1%*	*0.7%*	*8.3%*	*100%*		
Super Creative Core	0	5	39	15	97	784	38	41	287	62	1	1	67	1,438	15.8%	50.9%
% of Super Creative Core	*0.0%*	*0.4%*	*2.7%*	*1.1%*	*6.8%*	*54.6%*	*2.6%*	*2.9%*	*20.0%*	*4.3%*	*0.1%*	*0.1%*	*4.6%*	*100%*		
Creative Professionals	0	42	28	78	87	280	299	76	30	279	1	20	167	1,386	15.2%	49.1%
% of Creative Professionals	*0.0%*	*3.0%*	*2.0%*	*5.6%*	*6.3%*	*20.2%*	*21.6%*	*5.5%*	*2.1%*	*20.2%*	*0.1%*	*1.4%*	*12.0%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

South Dorchester

Figure 4-7: South Dorchester Neighborhood Map

Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

While South Dorchester has the sixth-highest number of establishments of Boston neighborhoods, its 26.6% of Creative Class employees ranks twelfth among neighborhoods (Table 4-3). More than 50% of this employment is concentrated in the health care and social assistance sector, while educational services contributes another 16% of Creative Class employment (Table 4-10). South Dorchester does not have any colleges or innovation support organizations, but its Main Streets areas benefit from direct Red Line access, giving the neighborhood some of the fastest transit times to South Station and the Innovation District (Figure 4-7). There are a number of city-owned commercial parcels along the commuter rail line, but these are located outside the neighborhood's Main Streets areas. There is one city-owned industrial parcel in the Field's Corner Main Streets area, with 3,000 square feet of land.

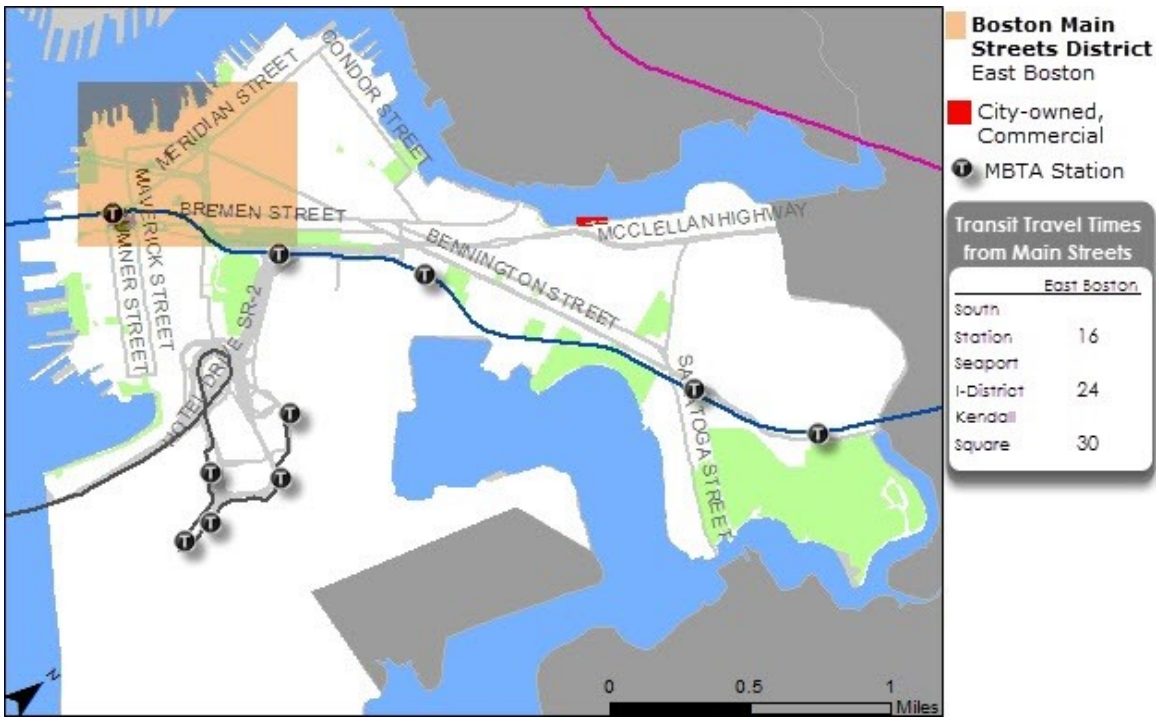
Table 4-10: South Dorchester Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of South Dorchester Employees**	**% of South Dorchester Creative Class Employees**
South Dorchester Firms	0	95	16	188	11	5	95	91	26	150	15	92	160	944	-	-
% of South Dorchester Firms	*0.0%*	*10.1%*	*1.7%*	*19.9%*	*1.2%*	*0.5%*	*10.1%*	*9.6%*	*2.8%*	*15.9%*	*1.6%*	*9.7%*	*16.9%*	*100%*		
South Dorchester Employees	0	1,134	186	2,181	193	30	630	601	741	4,404	247	1,196	1,016	12,557	100.0%	-
% of South Dorchester Employees	*0.0%*	*9.0%*	*1.5%*	*17.4%*	*1.5%*	*0.2%*	*5.0%*	*4.8%*	*5.9%*	*35.1%*	*2.0%*	*9.5%*	*8.1%*	*100%*		
Creative Class	**0**	**129**	**15**	**206**	**46**	**11**	**163**	**246**	**540**	**1,701**	**26**	**34**	**223**	**3,341**	**26.6%**	**100.0%**
% of Creative Class Employees	*0.0%*	*3.9%*	*0.5%*	*6.2%*	*1.4%*	*0.3%*	*4.9%*	*7.4%*	*16.2%*	*50.9%*	*0.8%*	*1.0%*	*6.7%*	*100%*		
Super Creative Core	0	19	5	28	18	7	17	60	469	274	14	2	73	985	7.8%	29.5%
% of Super Creative Core	*0.0%*	*1.9%*	*0.5%*	*2.9%*	*1.8%*	*0.7%*	*1.7%*	*6.1%*	*47.6%*	*27.8%*	*1.4%*	*0.2%*	*7.4%*	*100%*		
Creative Professionals	0	110	10	178	28	4	146	186	71	1,427	12	32	150	2,356	18.8%	70.5%
% of Creative Professionals	*0.0%*	*4.7%*	*0.4%*	*7.6%*	*1.2%*	*0.2%*	*6.2%*	*7.9%*	*3.0%*	*60.6%*	*0.5%*	*1.4%*	*6.4%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

East Boston

Figure 4-8: East Boston Neighborhood Map



Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

At 12.1%, East Boston has the smallest percentage of Creative Class employees of any Boston neighborhood (Table 4-3). This is due in large part to the dominance of the transportation, warehousing and utilities sector connected to the airport. There are more than 9,400 total employees in this sector, but less than 10% fall into Creative Class occupations (Table 4-11). In comparison, nearly 40% of the neighborhood's health care and social assistance industry employees are part of the Creative Class. The neighborhood saw just 23 new innovative business registrations in 2012 and 2013 (Table 4-1), and has one developable city-owned commercial parcel located well outside the East Boston Main Streets area (Figure 4-8). While current transit access from the Main Streets area to the Innovation District is decent, it would become even faster with the planned Silver Line extension through East Boston, providing a one-seat fast connection between the two harbor neighborhoods.

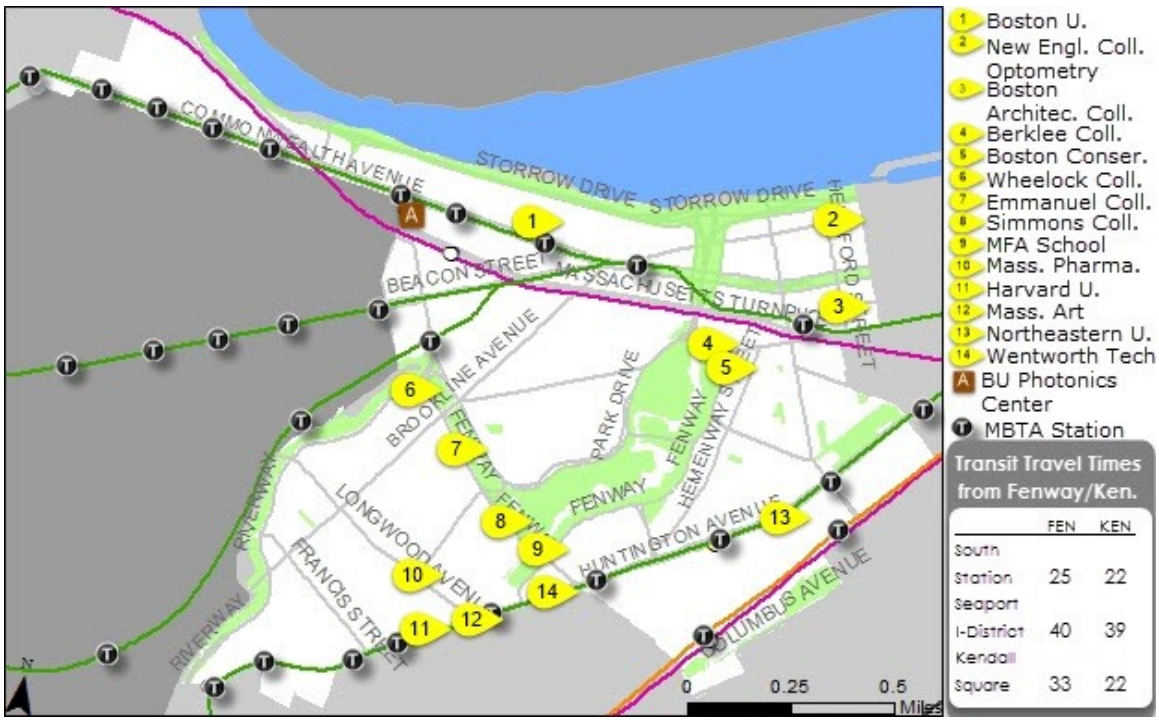
Table 4-11: East Boston Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of East Boston Employees**	**% of East Boston Creative Class Employees**
East Boston Firms	0	38	16	128	130	5	60	67	8	45	6	121	84	708	-	-
% of East Boston Firms	*0.0%*	*5.4%*	*2.3%*	*18.1%*	*18.4%*	*0.7%*	*8.5%*	*9.5%*	*1.1%*	*6.4%*	*0.8%*	*17.1%*	*11.9%*	*100%*		
East Boston Employees	0	399	676	1,166	9,443	84	851	1,162	53	1,446	90	3,239	456	19,065	100.0%	-
% of East Boston Employees	*0.0%*	*2.1%*	*3.5%*	*6.1%*	*49.5%*	*0.4%*	*4.5%*	*6.1%*	*0.3%*	*7.6%*	*0.5%*	*17.0%*	*2.4%*	*100%*		
Creative Class	**0**	**43**	**80**	**98**	**930**	**46**	**131**	**168**	**40**	**559**	**24**	**133**	**51**	**2,303**	**12.1%**	**100.0%**
% of Creative Class Employees	*0.0%*	*1.8%*	*3.5%*	*4.3%*	*40.4%*	*2.0%*	*5.7%*	*7.3%*	*1.7%*	*24.3%*	*1.1%*	*5.8%*	*2.2%*	*100%*		
Super Creative Core	0	4	32	11	233	32	15	48	36	97	17	8	17	551	2.9%	23.9%
% of Super Creative Core	*0.0%*	*0.8%*	*5.7%*	*2.1%*	*42.4%*	*5.7%*	*2.7%*	*8.8%*	*6.6%*	*17.6%*	*3.1%*	*1.4%*	*3.1%*	*100%*		
Creative Professionals	0	38	49	87	696	14	116	120	4	462	7	125	34	1,752	9.2%	76.1%
% of Creative Professionals	*0.0%*	*2.2%*	*2.8%*	*4.9%*	*39.7%*	*0.8%*	*6.6%*	*6.9%*	*0.2%*	*26.4%*	*0.4%*	*7.2%*	*1.9%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

Fenway/Kenmore

Figure 4-9: Fenway/Kenmore Neighborhood Map



Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

Fenway/Kenmore boasts the city's largest Creative Class percentage, comprising 51.3% of all employees in the neighborhood (Table 4-12). It is home to several world-class hospitals in the Longwood Medical Area and the largest number of colleges in the city – 14 in all. These industries of health care and social assistance and educational services make up a disproportionate 89% of the neighborhood's Creative Class. Despite the large Creative Class, however, the neighborhood's entrepreneurial environment appears weak. Fenway/Kenmore had just 16 new innovative business registrations in 2012 and 2013, trailing only Mattapan among Boston neighborhoods (Table 4-1). Its only incubator is the Boston University Photonics Center, a 15,000 square-foot facility housing 11 companies (Boston University Photonics Center, 2013). Transit options are plentiful, with access to various branches of the Green Line and the Orange Line (Figure 4-9). It is also one of the closest neighborhoods to Kendall Square.

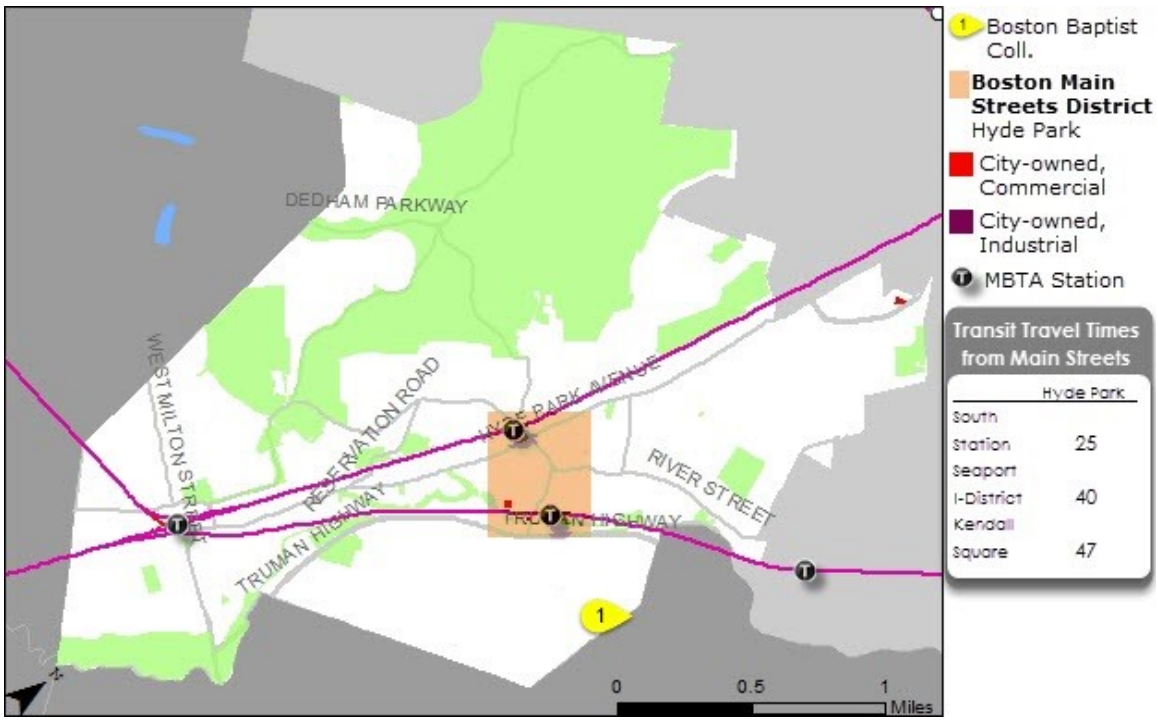
Table 4-12: Fenway/Kenmore Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of Fenway/Kenmore Employees**	**% of Fenway/Kenmore Creative Class Employees**
Fenway/Kenmore Firms	0	8	8	158	8	32	118	164	35	104	36	312	198	1,181	-	-
% of Fenway/Kenmore Firms	*0.0%*	*0.7%*	*0.7%*	*13.4%*	*0.7%*	*2.7%*	*10.0%*	*13.9%*	*3.0%*	*8.8%*	*3.0%*	*26.4%*	*16.8%*	*100%*		
Fenway/Kenmore Employees	0	64	141	2,995	150	720	3,330	2,922	21,872	59,231	3,010	7,267	2,147	103,848	100.0%	-
% of Fenway/Kenmore Employees	*0.0%*	*0.1%*	*0.1%*	*2.9%*	*0.1%*	*0.7%*	*3.2%*	*2.8%*	*21.1%*	*57.0%*	*2.9%*	*7.0%*	*2.1%*	*100%*		
Creative Class	**0**	**6**	**23**	**291**	**21**	**347**	**1,569**	**1,933**	**14,875**	**32,568**	**993**	**245**	**369**	**53,239**	**51.3%**	**100.0%**
% of Creative Class Employees	*0.0%*	*0.0%*	*0.0%*	*0.5%*	*0.0%*	*0.7%*	*2.9%*	*3.6%*	*27.9%*	*61.2%*	*1.9%*	*0.5%*	*0.7%*	*100%*		
Super Creative Core	0	1	11	84	10	245	331	1,262	11,492	1,413	716	14	148	15,727	15.1%	29.5%
% of Super Creative Core	*0.0%*	*0.0%*	*0.1%*	*0.5%*	*0.1%*	*1.6%*	*2.1%*	*8.0%*	*73.1%*	*9.0%*	*4.6%*	*0.1%*	*0.9%*	*100%*		
Creative Professionals	0	5	12	207	11	101	1,237	672	3,383	31,155	277	231	221	37,513	36.1%	70.5%
% of Creative Professionals	*0.0%*	*0.0%*	*0.0%*	*0.6%*	*0.0%*	*0.3%*	*3.3%*	*1.8%*	*9.0%*	*83.1%*	*0.7%*	*0.6%*	*0.6%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

Hyde Park

Figure 4-10: Hyde Park Neighborhood Map



Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

As a small, mostly residential neighborhood, Hyde Park has one of the smaller overall employment bases in Boston, and also has one of the lowest Creative Class percentages at 19.1% (Table 4-13). The health care and social assistance and educational services sectors compose the largest share of Creative Class employment in the neighborhood. Because of the small overall employment base and high share of retail and wholesale trade establishments, the trade sector actually contributes the third largest share of Creative Class employees in the neighborhood. There are two city-owned commercial properties located in the Hyde Park Main Streets area right along the commuter rail corridor, totaling nearly 15,000 square feet of vacant land (Figure 4-10).

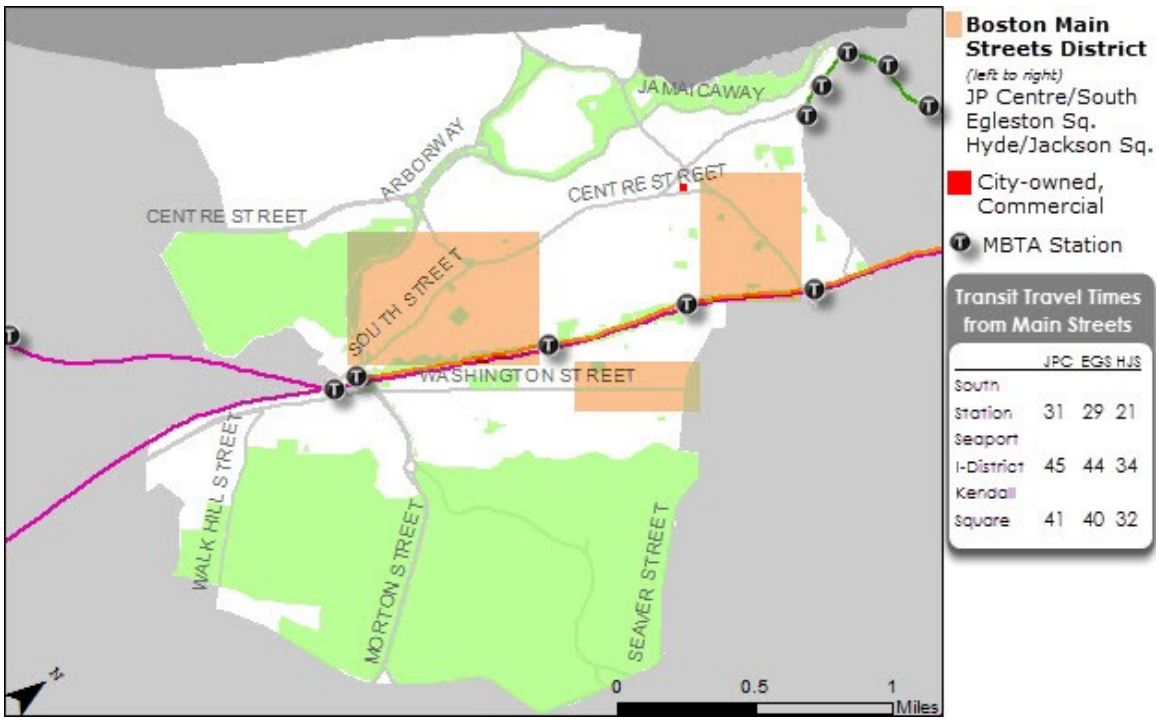
Table 4-13: Hyde Park Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of Hyde Park Employees**	**% of Hyde Park Creative Class Employees**
Hyde Park Firms	0	68	19	78	15	2	27	44	11	44	5	37	63	413	-	-
% of Hyde Park Firms	*0.0%*	*16.5%*	*4.6%*	*18.9%*	*3.6%*	*0.5%*	*6.5%*	*10.7%*	*2.7%*	*10.7%*	*1.2%*	*9.0%*	*15.3%*	*100%*		
Hyde Park Employees	0	442	231	853	113	15	215	338	251	682	43	277	384	3,843	100.0%	-
% of Hyde Park Employees	*0.0%*	*11.5%*	*6.0%*	*22.2%*	*2.9%*	*0.4%*	*5.6%*	*8.8%*	*6.5%*	*17.7%*	*1.1%*	*7.2%*	*10.0%*	*100%*		
Creative Class	**0**	**44**	**30**	**83**	**21**	**9**	**53**	**56**	**189**	**212**	**5**	**7**	**48**	**758**	**19.7%**	**100.0%**
% of Creative Class Employees	*0.0%*	*5.8%*	*4.0%*	*11.0%*	*2.8%*	*1.2%*	*7.0%*	*7.4%*	*24.9%*	*28.0%*	*0.7%*	*1.0%*	*6.3%*	*100%*		
Super Creative Core	0	5	13	10	10	6	6	18	172	20	3	1	20	284	7.4%	37.5%
% of Super Creative Core	*0.0%*	*1.9%*	*4.4%*	*3.5%*	*3.6%*	*2.2%*	*2.2%*	*6.2%*	*60.4%*	*7.0%*	*1.2%*	*0.2%*	*7.1%*	*100%*		
Creative Professionals	0	38	17	73	11	3	47	38	17	192	2	7	28	474	12.3%	62.5%
% of Creative Professionals	*0.0%*	*8.1%*	*3.7%*	*15.5%*	*2.4%*	*0.6%*	*9.9%*	*8.0%*	*3.6%*	*40.6%*	*0.4%*	*1.4%*	*5.8%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

Jamaica Plain

Figure 4-11: Jamaica Plain Neighborhood Map



Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

Jamaica Plain boasts the city's sixth-highest Creative Class percentage at 35.6%, but that employment is heavily concentrated in the health care and social sector, which accounts for 71.6% of the neighborhood's Creative Class employees (Table 4-14). Professional and business services is the neighborhood's second largest innovative industry, representing 12.0% of the neighborhood's Creative Class employees. Jamaica Plain lacks the presence of colleges or innovation support organizations, although the Brewery small business complex that caters to more long-term tenants is a widely copied model in other cities. The neighborhood ranks relatively high in new innovative business registrations, with 53 in 2012 and 2013 (Table 4-1). The City of Boston owns a 3,600 square-foot vacant parcel, which is already under development as part of the Jackson Square Redevelopment Master Plan; the area has good transit access via the Jackson Square Orange Line station (Figure 4-11).

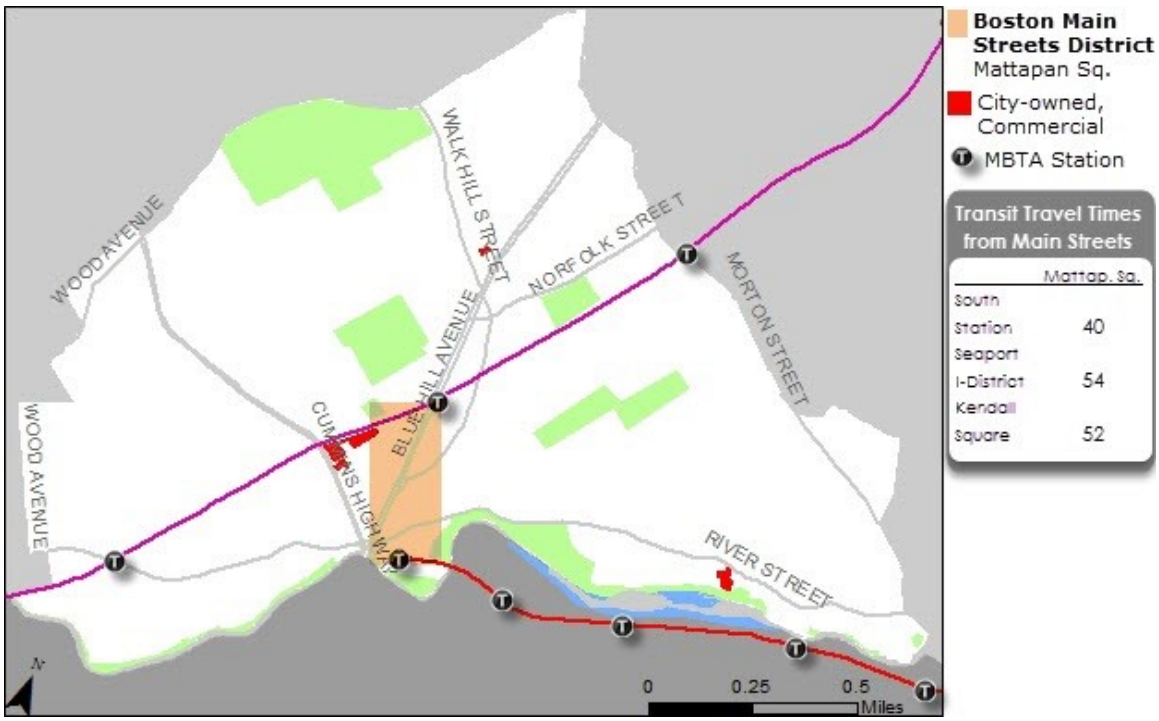
Table 4-14: Jamaica Plain Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of Jamaica Plain Employees**	**% of Jamaica Plain Creative Class Employees**
Jamaica Plain Firms	1	31	16	88	11	7	39	87	16	115	10	77	84	582	-	-
% of Jamaica Plain Firms	*0.2%*	*5.3%*	*2.7%*	*15.1%*	*1.9%*	*1.2%*	*6.7%*	*14.9%*	*2.7%*	*19.8%*	*1.7%*	*13.2%*	*14.4%*	*100%*		
Jamaica Plain Employees	7	386	167	910	421	50	264	928	279	6,972	29	897	652	11,961	100.0%	-
% of Jamaica Plain Employees	*0.1%*	*3.2%*	*1.4%*	*7.6%*	*3.5%*	*0.4%*	*2.2%*	*7.8%*	*2.3%*	*58.3%*	*0.2%*	*7.5%*	*5.5%*	*100%*		
Creative Class	**2**	**43**	**24**	**100**	**17**	**27**	**65**	**512**	**202**	**3,049**	**10**	**26**	**180**	**4,257**	**35.6%**	**100.0%**
% of Creative Class Employees	*0.0%*	*1.0%*	*0.6%*	*2.3%*	*0.4%*	*0.6%*	*1.5%*	*12.0%*	*4.8%*	*71.6%*	*0.2%*	*0.6%*	*4.2%*	*100%*		
Super Creative Core	1	6	10	23	1	19	7	240	172	311	7	1	62	862	7.2%	20.2%
% of Super Creative Core	*0.1%*	*0.7%*	*1.2%*	*2.7%*	*0.1%*	*2.2%*	*0.8%*	*27.8%*	*20.0%*	*36.1%*	*0.9%*	*0.2%*	*7.2%*	*100%*		
Creative Professionals	1	36	14	77	17	8	58	273	30	2,737	2	25	117	3,395	28.4%	79.8%
% of Creative Professionals	*0.0%*	*1.1%*	*0.4%*	*2.3%*	*0.5%*	*0.2%*	*1.7%*	*8.0%*	*0.9%*	*80.6%*	*0.1%*	*0.7%*	*3.5%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

Mattapan

Figure 4-12: Mattapan Neighborhood Map



Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

Mattapan's Creative Class percentage stands at 20.5%, the third-lowest among Boston neighborhoods (Table 4-15, Table 4-3). While the health care and social assistance sector accounts for a large part of this employment, professional and business services makes up nearly 20% of the neighborhood's Creative Class employment. New innovative business registrations were limited, with just 13 in 2012 and 2013 (Table 4-1). There are a few city-owned commercial properties concentrated along the commuter rail corridor adjacent to the Mattapan Square Main Streets area. (Figure 4-12). Two pairs of adjacent parcels on Cummins Highway and Regis Road each have more than 50,000 square feet of vacant land.

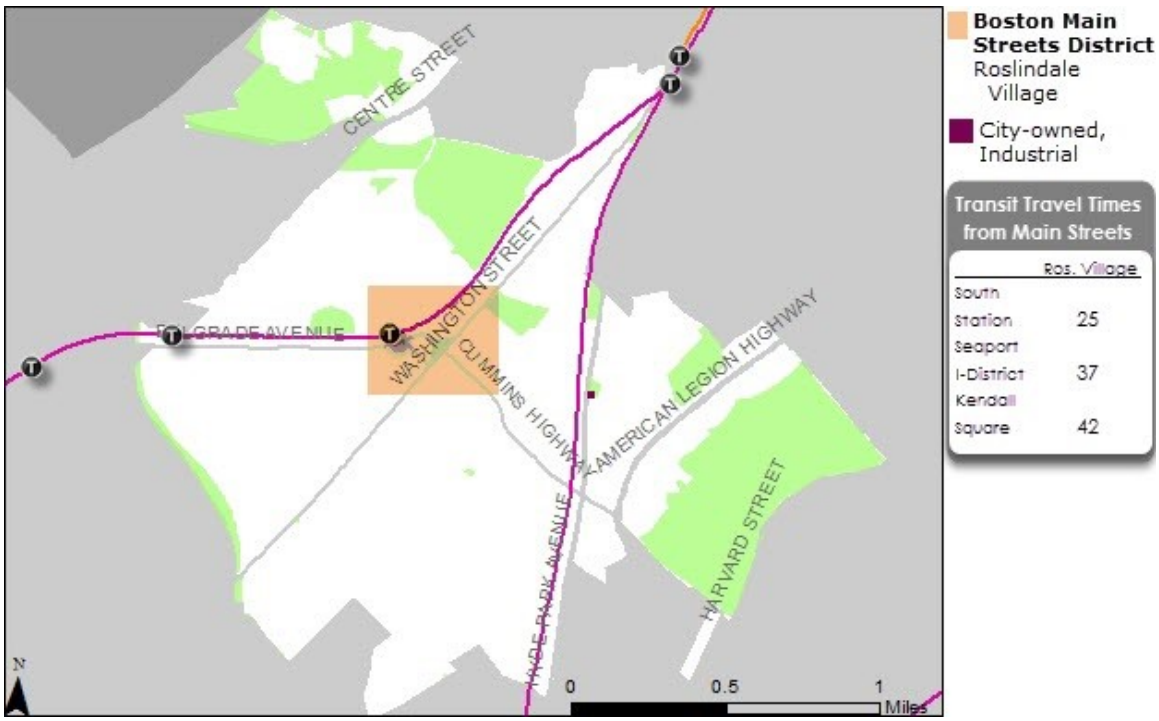
Table 4-15: Mattapan Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of Mattapan Employees**	**% of Mattapan Creative Class Employees**
Mattapan Firms	0	15	4	45	5	2	20	17	3	41	2	25	39	218	-	-
% of Mattapan Firms	*0.0%*	*6.9%*	*1.8%*	*20.6%*	*2.3%*	*0.9%*	*9.2%*	*7.8%*	*1.4%*	*18.8%*	*0.9%*	*11.5%*	*17.9%*	*100%*		
Mattapan Employees	0	112	33	505	25	15	68	151	10	550	15	225	240	1,949	100.0%	-
% of Mattapan Employees	*0.0%*	*5.7%*	*1.7%*	*25.9%*	*1.3%*	*0.7%*	*3.5%*	*7.8%*	*0.5%*	*28.2%*	*0.7%*	*11.5%*	*12.3%*	*100%*		
Creative Class	**0**	**9**	**3**	**42**	**1**	**5**	**19**	**76**	**7**	**187**	**1**	**6**	**41**	**399**	**20.5%**	**100.0%**
% of Creative Class Employees	*0.0%*	*2.3%*	*0.8%*	*10.6%*	*0.4%*	*1.2%*	*4.8%*	*19.1%*	*1.7%*	*47.0%*	*0.3%*	*1.4%*	*10.3%*	*100%*		
Super Creative Core	0	1	1	2	0	2	2	14	5	40	1	0	16	84	4.3%	21.1%
% of Super Creative Core	*0.0%*	*0.8%*	*1.3%*	*2.4%*	*0.1%*	*2.9%*	*2.8%*	*16.4%*	*5.6%*	*47.1%*	*0.8%*	*0.3%*	*19.5%*	*100%*		
Creative Professionals	0	9	2	40	1	2	17	62	2	148	1	6	25	315	16.1%	78.9%
% of Creative Professionals	*0.0%*	*2.8%*	*0.7%*	*12.8%*	*0.4%*	*0.8%*	*5.4%*	*19.8%*	*0.7%*	*46.9%*	*0.2%*	*1.8%*	*7.8%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

Roslindale

Figure 4-13: Roslindale Neighborhood Map



Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

Among Boston's outer residential neighborhoods, Roslindale has the highest percentage of Creative Class employees at 30.3% (Table 4-16, Table 4-3). Nearly 70% of employment is attributable to the presence of a handful of large employers in the health care and social assistance sector, with professional and business services representing the second most at 7.5%. As a relatively remote outer neighborhood, there are no colleges or innovation support organizations, and new business registrations were fairly light, with 26 total in 2012 and 2013 (Table 4-1). The neighborhood is home to the Roslindale Main Streets organization, and has quick access to South Station via commuter rail (Figure 4-13).

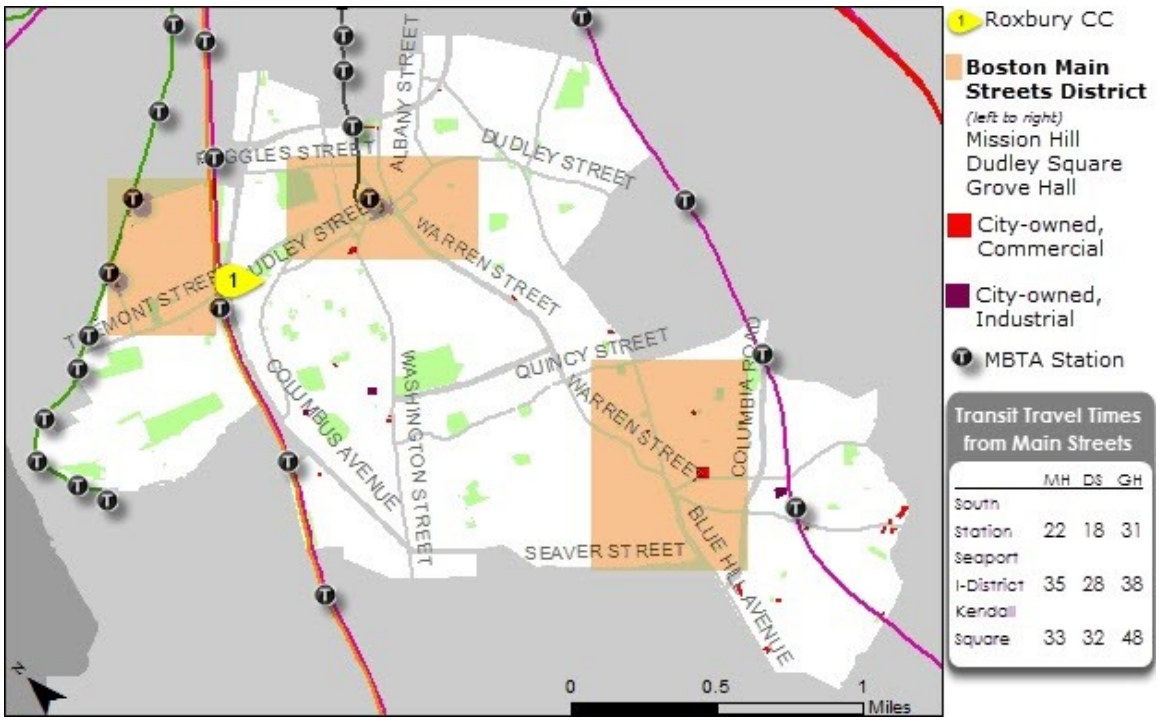
Table 4-16: Roslindale Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of Roslindale Employees**	**% of Roslindale Creative Class Employees**
Roslindale Firms	0	31	6	89	4	6	35	50	10	52	3	56	51	393	-	-
% of Roslindale Firms	*0.0%*	*7.9%*	*1.5%*	*22.6%*	*1.0%*	*1.5%*	*8.9%*	*12.7%*	*2.5%*	*13.2%*	*0.8%*	*14.2%*	*13.0%*	*100%*		
Roslindale Employees	0	152	65	858	40	34	243	451	97	2,042	11	711	276	4,980	100.0%	-
% of Roslindale Employees	*0.0%*	*3.0%*	*1.3%*	*17.2%*	*0.8%*	*0.7%*	*4.9%*	*9.1%*	*2.0%*	*41.0%*	*0.2%*	*14.3%*	*5.5%*	*100%*		
Creative Class	**0**	**16**	**5**	**96**	**1**	**11**	**64**	**113**	**73**	**1,052**	**4**	**23**	**51**	**1,508**	**30.3%**	**100.0%**
% of Creative Class Employees	*0.0%*	*1.0%*	*0.3%*	*6.4%*	*0.1%*	*0.8%*	*4.2%*	*7.5%*	*4.8%*	*69.8%*	*0.2%*	*1.5%*	*3.4%*	*100%*		
Super Creative Core	0	2	1	14	0	6	7	37	65	166	3	1	18	321	6.5%	21.3%
% of Super Creative Core	*0.0%*	*0.7%*	*0.4%*	*4.4%*	*0.0%*	*2.0%*	*2.2%*	*11.7%*	*20.1%*	*51.8%*	*0.9%*	*0.2%*	*5.7%*	*100%*		
Creative Professionals	0	13	3	82	1	5	57	75	8	886	1	22	33	1,187	23.8%	78.7%
% of Creative Professionals	*0.0%*	*1.1%*	*0.3%*	*6.9%*	*0.1%*	*0.4%*	*4.8%*	*6.3%*	*0.7%*	*74.6%*	*0.1%*	*1.9%*	*2.8%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

Roxbury

Figure 4-14: Roxbury Neighborhood Map



Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

Roxbury's Creative Class percentage of 26.8% ranks in the middle of Boston neighborhoods (Table 4-17, Table 4-3). It is dominated by the health care and social assistance sector, with financial activities a distant second in contribution to the Creative Class. Like Charlestown, this percentage would be boosted by the inclusion of Roxbury Community College (RCC), a public institution. Despite its average patterns of existing innovation, Roxbury ranks fourth in new business registrations, behind only the CBD neighborhoods and South Boston (Table 4-1). The neighborhood's Mission Hill Main Streets (MHMS) area abuts the Longwood Medical Area, while both MHMS and Dudley Square Main Streets have direct access to RCC. City-owned properties in the neighborhood include a series of seven abutting commercial parcels in the heart of Dudley Square comprising 10,000 square feet of vacant land and a series of parcels half that size in the heart of Grove Hall with existing buildings (Figure 4-14).

Table 4-17: Roxbury Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of Roxbury Employees**	**% of Roxbury Creative Class Employees**
Roxbury Firms	0	48	10	127	16	10	72	58	15	160	10	73	113	712	-	-
% of Roxbury Firms	*0.0%*	*6.7%*	*1.4%*	*17.8%*	*2.2%*	*1.4%*	*10.1%*	*8.1%*	*2.1%*	*22.5%*	*1.4%*	*10.3%*	*15.9%*	*100%*		
Roxbury Employees	0	1,227	191	1,795	102	100	993	400	437	4,443	227	829	779	11,524	100.0%	-
% of Roxbury Employees	*0.0%*	*10.6%*	*1.7%*	*15.6%*	*0.9%*	*0.9%*	*8.6%*	*3.5%*	*3.8%*	*38.6%*	*2.0%*	*7.2%*	*6.8%*	*100%*		
Creative Class	**0**	**147**	**15**	**185**	**5**	**49**	**222**	**142**	**323**	**1,724**	**67**	**25**	**184**	**3,088**	**26.8%**	**100.0%**
% of Creative Class Employees	*0.0%*	*4.8%*	*0.5%*	*6.0%*	*0.2%*	*1.6%*	*7.2%*	*4.6%*	*10.4%*	*55.8%*	*2.2%*	*0.8%*	*6.0%*	*100%*		
Super Creative Core	0	14	5	33	1	33	20	52	284	311	43	1	74	870	7.5%	28.2%
% of Super Creative Core	*0.0%*	*1.6%*	*0.6%*	*3.8%*	*0.1%*	*3.8%*	*2.3%*	*6.0%*	*32.6%*	*35.7%*	*4.9%*	*0.1%*	*8.5%*	*100%*		
Creative Professionals	0	133	10	151	5	16	202	90	39	1,413	24	24	110	2,218	19.2%	71.8%
% of Creative Professionals	*0.0%*	*6.0%*	*0.5%*	*6.8%*	*0.2%*	*0.7%*	*9.1%*	*4.1%*	*1.7%*	*63.7%*	*1.1%*	*1.1%*	*5.0%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

South Boston

Figure 4-15: South Boston Neighborhood Map

Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

Driven by the growth of the Innovation District, South Boston ranks fourth among Boston neighborhoods with a Creative Class percentage of 39.0% (Table 4-18, Table 4-3). Unlike many of Boston's neighborhoods that derive a large share of their Creative Class from the health care and social assistance sector, South Boston's innovative employment is dominated by financial activities and professional and business services. The neighborhood saw 73 new business registrations in 2012 and 2013, trailing only Central Boston and Back Bay/Beacon Hill (Table 4-1). Innovation support organizations have sprouted up across the Innovation District during the past few years. Babson College even opened an Innovation District campus in the wake of the area's growth. With the Silver Line extending through the Seaport and the Red Line serving the Broadway commercial district, South Boston has some of the best proximity to downtown Boston and Kendall Square among Boston neighborhoods (Figure 4-15).

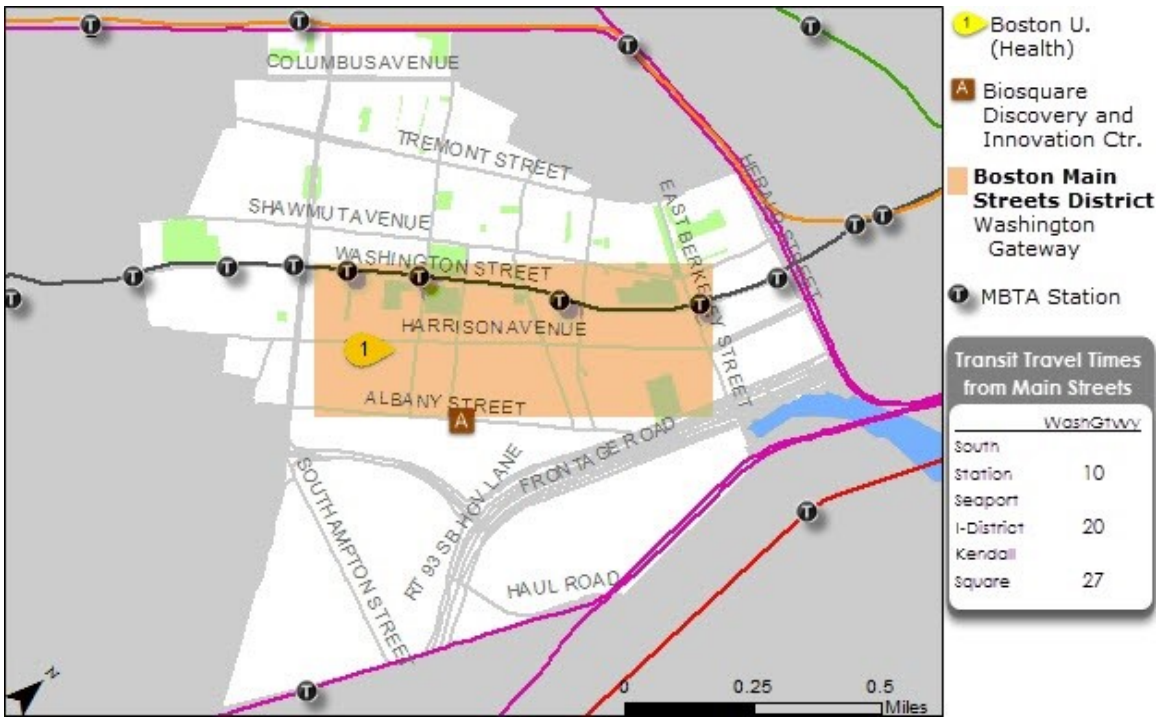
Table 4-18: South Boston Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of South Boston Employees**	**% of South Boston Creative Class Employees**
South Boston Firms	2	71	46	238	55	74	146	378	16	58	22	144	133	1,383	-	-
% of South Boston Firms	*0.1%*	*5.1%*	*3.3%*	*17.2%*	*4.0%*	*5.4%*	*10.6%*	*27.3%*	*1.2%*	*4.2%*	*1.6%*	*10.4%*	*9.6%*	*100%*		
South Boston Employees	11	998	2,384	2,525	1,420	2,065	10,578	8,623	645	1,418	454	3,731	1,439	36,291	100.0%	-
% of South Boston Employees	*0.0%*	*2.8%*	*6.6%*	*7.0%*	*3.9%*	*5.7%*	*29.1%*	*23.8%*	*1.8%*	*3.9%*	*1.2%*	*10.3%*	*4.0%*	*100%*		
Creative Class	**1**	**145**	**359**	**362**	**86**	**1,234**	**5,299**	**4,979**	**487**	**486**	**104**	**147**	**448**	**14,136**	**39.0%**	**100.0%**
% of Creative Class Employees	*0.0%*	*1.0%*	*2.5%*	*2.6%*	*0.6%*	*8.7%*	*37.5%*	*35.2%*	*3.4%*	*3.4%*	*0.7%*	*1.0%*	*3.2%*	*100%*		
Super Creative Core	1	23	141	105	13	844	1,075	2,364	428	187	65	9	133	5,387	14.8%	38.1%
% of Super Creative Core	*0.0%*	*0.4%*	*2.6%*	*1.9%*	*0.2%*	*15.7%*	*20.0%*	*43.9%*	*7.9%*	*3.5%*	*1.2%*	*0.2%*	*2.5%*	*100%*		
Creative Professionals	1	122	218	257	73	390	4,224	2,615	59	299	40	138	315	8,749	24.1%	61.9%
% of Creative Professionals	*0.0%*	*1.4%*	*2.5%*	*2.9%*	*0.8%*	*4.5%*	*48.3%*	*29.9%*	*0.7%*	*3.4%*	*0.5%*	*1.6%*	*3.6%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

South End

Figure 4-16: South End Neighborhood Map



Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

Boston's South End has the city's third-highest Creative Class percentage at 39.4% (Table 4-19, Table 4-3), driven primarily by the presence of the Boston Medical Center and Boston University medical campus. While these industries dominate innovative employment in the neighborhood, the professional and business services sector is also strong, accounting for 10.1% of the neighborhood's Creative Class employees. Like Fenway/Kenmore, Boston University runs the neighborhood's sole innovate support organization at the Biosquare Discovery and Innovation Center, a premier location for biomedical research firms (Boston University Biosquare). The South End also ranks relatively low in new innovative business registrations, with just 29 in 2012 and 2013 (Table 4-1). The Washington Gateway Main Streets area of the neighborhood has strong transit access via the Silver Line, which is the only transit line besides the Red Line with direct access to South Station (Figure 4-16).

Table 4-19: South End Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of South End Employees**	**% of South End Creative Class Employees**
South End Firms	0	21	23	181	7	17	67	160	9	86	14	90	80	755	-	-
% of South End Firms	*0.0%*	*2.8%*	*3.0%*	*24.0%*	*0.9%*	*2.3%*	*8.9%*	*21.2%*	*1.2%*	*11.4%*	*1.9%*	*11.9%*	*10.6%*	*100%*		
South End Employees	0	734	707	2,354	80	510	489	1,660	3,527	7,135	245	1,692	718	19,851	100.0%	-
% of South End Employees	*0.0%*	*3.7%*	*3.6%*	*11.9%*	*0.4%*	*2.6%*	*2.5%*	*8.4%*	*17.8%*	*35.9%*	*1.2%*	*8.5%*	*3.6%*	*100%*		
Creative Class	**0**	**128**	**92**	**272**	**4**	**234**	**117**	**791**	**2,402**	**3,557**	**59**	**46**	**121**	**7,823**	**39.4%**	**100.0%**
% of Creative Class Employees	*0.0%*	*1.6%*	*1.2%*	*3.5%*	*0.0%*	*3.0%*	*1.5%*	*10.1%*	*30.7%*	*45.5%*	*0.8%*	*0.6%*	*1.5%*	*100%*		
Super Creative Core	0	21	38	61	0	171	12	425	1,860	263	44	2	47	2,945	14.8%	37.6%
% of Super Creative Core	*0.0%*	*0.7%*	*1.3%*	*2.1%*	*0.0%*	*5.8%*	*0.4%*	*14.4%*	*63.2%*	*8.9%*	*1.5%*	*0.1%*	*1.6%*	*100%*		
Creative Professionals	0	107	54	212	4	63	104	366	542	3,294	14	44	74	4,878	24.6%	62.4%
% of Creative Professionals	*0.0%*	*2.2%*	*1.1%*	*4.3%*	*0.1%*	*1.3%*	*2.1%*	*7.5%*	*11.1%*	*67.5%*	*0.3%*	*0.9%*	*1.5%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

West Roxbury

Figure 4-17: West Roxbury Neighborhood Map

Sources: MassGIS; MBTA; Google Maps; IPEDS; City of Boston Department of Neighborhood Development

Although situated on the outskirts of Boston, West Roxbury is a large neighborhood, and has a larger employment base than some of Boston's other outer residential neighborhoods. Its Creative Class percentage is still a relatively low 23.9%, again with a substantial share coming from the health care and social assistance sector, with professional and business services and educational services rounding out the top three contributing sectors (Table 4-20). New innovative business registrations were also limited, with just 20 in 2012 and 2013 (Table 4-3). Transit access from the West Roxbury Main Streets area is strong, with two commuter rail stations and quick access to South Station (Figure 4-17). The City of Boston has one developable industrial parcel in the Main Streets area along the commuter rail corridor, with more than 60,000 square feet of land.

Table 4-20: West Roxbury Business Patterns

	Natural Resources and Mining	Construction	Manufacturing	Trade	Transportation, Warehousing, and Utilities	Information Services	Financial Activities	Professional and Business Services	Educational Services	Health Care and Social Assistance	Arts, Entertainment, and Recreation	Accommodation and Food Services	Other Services	**TOTALS**	**% of West Roxbury Employees**	**% of West Roxbury Creative Class Employees**
West Roxbury Firms	1	30	7	77	8	3	44	80	17	72	8	47	74	468	-	-
% of West Roxbury Firms	*0.2%*	*6.4%*	*1.5%*	*16.5%*	*1.7%*	*0.6%*	*9.4%*	*17.1%*	*3.6%*	*15.4%*	*1.7%*	*10.0%*	*15.8%*	*100%*		
West Roxbury Employees	13	139	281	1,721	200	11	173	600	221	2,268	308	602	701	7,238	100.0%	-
% of West Roxbury Employees	*0.2%*	*1.9%*	*3.9%*	*23.8%*	*2.8%*	*0.2%*	*2.4%*	*8.3%*	*3.1%*	*31.3%*	*4.3%*	*8.3%*	*9.7%*	*100%*		
Creative Class	**1**	**16**	**57**	**114**	**48**	**5**	**45**	**275**	**166**	**871**	**29**	**15**	**85**	**1,729**	**23.9%**	**100.0%**
% of Creative Class Employees	*0.1%*	*0.9%*	*3.3%*	*6.6%*	*2.8%*	*0.3%*	*2.6%*	*15.9%*	*9.6%*	*50.4%*	*1.7%*	*0.9%*	*4.9%*	*100%*		
Super Creative Core	0	2	28	19	19	3	6	87	151	59	15	1	32	423	5.8%	24.5%
% of Super Creative Core	*0.1%*	*0.5%*	*6.7%*	*4.4%*	*4.5%*	*0.7%*	*1.3%*	*20.7%*	*35.6%*	*14.0%*	*3.6%*	*0.1%*	*7.7%*	*100%*		
Creative Professionals	1	14	29	95	29	2	40	188	15	812	14	15	53	1,306	18.0%	75.5%
% of Creative Professionals	*0.1%*	*1.1%*	*2.2%*	*7.3%*	*2.2%*	*0.1%*	*3.0%*	*14.4%*	*1.2%*	*62.2%*	*1.1%*	*1.1%*	*4.0%*	*100%*		

Sources: U.S. Census Bureau, 2011 Zip Code Business Patterns, Richard Florida, *The Rise of the Creative Class*; Bureau of Labor Statistics, Standard Occupational Classification

4.3 Discussion

In looking at the results for each neighborhood's existing innovation characteristics, a few patterns emerge. The first is that in most neighborhoods, the healthcare and social assistance sector plays an outsized role in the makeup of the Creative Class. While it is no secret that Boston is a center for education and healthcare, it was nonetheless surprising to see just how dominant healthcare was, not just in areas like Fenway/Kenmore with its Longwood Medical Area, but also in outer neighborhoods like Roxbury, Roslindale, and Mattapan, among others. Of course, the main "firms" in this sector are hospitals, which employ hundreds – often thousands – of people. So, in neighborhoods with a small total employment base, a large hospital in the neighborhood will have a significant impact on the share of employees in the healthcare and social assistance sector.

While healthcare is a knowledge intensive sector and one that brings with it many stable, relatively well-paying jobs, it was nonetheless striking to see a neighborhood with the highest Creative Class percentage like Fenway/Kenmore – where 61.2% of the neighborhood's Creative Class is in the healthcare and social assistance sector – near the bottom of the list in new innovative business registrations and home to just one innovative support organization (Boston University's Photonics Center). This is all the more perplexing considering that another 27.9% of the neighborhood's Creative Class is derived from the educational services sector, as 14 colleges and universities are located in Fenway/Kenmore. The importance of the healthcare sector (and to a lesser extent, the educational services sector) in many neighborhoods stands in stark contrast to the industry patterns in South Boston, home to the Innovation District. There, more than 70% of the Creative Class comes from the professional and business services, financial activities, and information services sectors.

The second pattern that emerged, again not necessarily surprisingly, is that there is a disconnect between available developable inventory (here using city-owned property) versus the existing Creative Class in a neighborhood. If the City wanted to provide land or space to groups like MassChallenge, or an incubator focused more on the industrial side of the innovation economy, it has greater opportunities to do so Mattapan, Roxbury, or South Dorchester versus Fenway/Kenmore or the South End. But Fenway/Kenmore and the South End have more opportunities to build around existing innovative activity. Of course, this dilemma is not limited to the innovation economy, but is a central part of the challenges of economic development in areas of disinvestment.

Another difference that seemed worth noting is the type of transit access in each neighborhood. While this chapter presents travel times between the neighborhoods and the Innovation District, does the type of transit matter? Many neighborhoods have relatively quick access to the Innovation District and downtown core, but often this is via commuter rail rather than rapid transit. Considering that there is less frequency of commuter rail trains, does this diminish the potential knowledge spillover gains that could be had? There are important new transit connections underway. A new commuter rail station is set to open in Brighton, which will significantly cut the travel time to downtown, but it remains to be seen whether the trains' infrequency compared with existing transit will negate some of that impact. In East Boston – which ranked last in terms of neighborhood Creative Class percentage – a proposed extension of the Silver Line would take that transit line beyond Logan Airport and into the heart of East Boston. This would provide a direct connection to the Innovation District and potentially open up a wealth of development opportunity in East Boston.

Aside from the characteristics identified in this chapter, there are even differences in the emergence of the two innovation districts in the Boston area. Kendall Square's development benefitted largely from the connection with MIT. The South Boston waterfront has morphed into

the Innovation District, it seems, largely due to its proximity to downtown, improved transportation structure, and available land that, over time, more developers and firms took a chance on, and finally when the City gave a final push with the creation of the "Innovation District" in 2010.

The issues highlighted in the aforementioned paragraphs suggest just some of the complexity in looking at innovation characteristics in each neighborhood and trying to determine which are most important. While a table was presented at the start of the chapter ranking neighborhoods by Creative Class percentage, this complexity is why no attempt was made to comprehensively rank the neighborhoods. Each neighborhood has its strengths and weaknesses related to the innovation economy, and this analysis in Chapter 4 helps identify those.

5. Boston Main Streets, Today and Tomorrow

If the City of Boston intends on expanding the use of the innovation district model to other neighborhoods – a strategy that a number of politicians and commentators have called for – how would such a process take place, and with which organizations would the City work? While a full implementation analysis is beyond the scope of this thesis, I was interested in looking more closely at one group of organizations that has significant knowledge about neighborhood business conditions and could potentially work with new firms coming into the neighborhoods: Boston Main Streets.

Boston Main Streets was introduced in 1995 with the formation of 19 independent, 501(c)(3) organizations throughout the neighborhoods of Boston. It was the first attempt to utilize the National Trust for Historic Preservation's Main Streets model – aimed at commercial district revitalization – at an urban level. Operating in 20 districts today, the Main Streets organizations have become established contributors to business development in Boston. Boston Main Streets is also interesting because although the organizations are independent, they are still all part of the umbrella Boston Main Streets, allowing for potentially streamlined coordination between the organizations. Each organization is also connected with the City, from which it receives a significant share of operating costs, as well as technical support.

Based on a series of interviews, this chapter will look at the current operations and structure of select Boston Main Streets organizations, specifically seeking to identify the existing connections between select Boston Main Streets organizations and the innovation economy, along with future opportunities for such connections. Four executive directors were interviewed for this profile: Jennifer Effron of Washington Gateway Main Streets, Gerald Robbins of Hyde/Jackson Square Main Streets, Allison Carter of Brighton Main Streets, and Meaghan Overton of St.

Mark's Area Main Street. The first three organizations were targeted specifically based on my findings from Chapter 4, where I identified that the neighborhoods where these districts are situated – the South End, Jamaica Plain, and Allston-Brighton, respectively – had some of the highest Creative Class percentages in the city. The fourth – St. Mark's Area Main Street – doesn't have the same high Creative Class percentage, but does have strong transit access, a range of new development, and can help provide additional perspective. Rather than presenting the responses from each interview separately, the following narrative provides an issue-focused analysis, describing what has been learned from all of the participants on a range of topics.

5.1 Organizational Goals and Structure

Simply put, the business of Boston Main Streets is business. The interviewees all emphasized that a primary goal of their organizations is to create "thriving" and "vibrant" business districts, which come through a focus on economic development, but also through community building. Much of this is accomplished through the use of the Main Streets Four Points approach. The first point is organization, which focuses on strengthening the capacity of the Main Streets organizations to continue their work, through volunteer recruitment, fundraising, and relationship building. The second is promotion, to market the business district not only to local residents and employees, but to people who live and work outside the district as well. The third approach is design, focused primarily on façade improvements and streetscape improvements. The final point is economic restructuring, or what Robbins referred to as business development. This involves looking at which types of businesses in the neighborhood are doing well, how the mix can be improved, and what resources can be provided to the businesses to help them grow.

Each organization typically has just one employee – the executive director – and thus relies largely on those individuals to execute the organization's goals.[9] The directors I spoke with are all fairly new to their roles – ranging between 3 months and 2 years – but have extensive prior experience with community based organizations, either professionally or as a volunteer.

While the directors are typically the only employees, each organization relies heavily on a range of volunteers. This includes event-based volunteers, which help put on promotional events in the community like concerts and festivals, along with volunteers that work on committees organized around the Four Points. I would argue that the most critical group of volunteers, though, is the organization's board of directors, which draws from small business owners, property owners, neighborhood residents, and for some neighborhoods, representatives from large employers in, or adjacent to, the district. The board members, with the executive director, are directly responsible for shaping the vision and goals of the organization.

As mentioned earlier, the organizations have a unique relationship with the City, as compared with more traditional community based organizations. Each organization has a contract with the City to provide business services in the community, and in return the City provides sizeable financing to the organization, as well as technical support. Financing typically covers rents and salaries, while technical support – for neighborhood businesses, not the Main Streets organization itself – comes in the form of training providers for a range of services, such as website design, inventory management, marketing, business planning, and more. The City, through the Office of Business Development, also has neighborhood business managers that work with five or six different organizations, as a conduit to these services.

While the organizations seem to have good working relationships with the City, it is still a balancing act of managing that relationship as an independent organization. They do not see

[9] St. Mark's Area Main Street recently hired a manager for their new Farmer's Market, and they have occasionally had a part-time assistant for administrative tasks.

themselves as extensions of City Hall, but as a few said, there are advantages of cutting through some city bureaucracy that maybe would be more difficult as a completely unaffiliated organization. A few directors also commented that the work their organizations do takes a lot off the plate of the City, and is generally a good deal for the City.

The organizations are required to come up with funding for any additional programming. Most turn to foundations, in particular the Boston Main Streets Foundation, an independent foundation funded primarily by banks and developers, while some organizations also receive funding directly from large employers in their neighborhoods. Funding sometimes comes from mitigation fees for development projects as well.

5.2 Business Environment and Neighborhood Strengths

While many of the large employers that play an outsized role in driving the high Creative Class percentages in these neighborhoods are often located directly adjacent to the Main Streets commercial districts, these districts are dominated by what a few directors referred to as "microbusinesses," with an owner and maybe one or two part-time employees. Many of these are in traditional neighborhood commercial district industries, such as restaurants, retail, salons, professional services such as attorneys and accountants, health centers and dentists, and other local services. Still, each neighborhood has its own unique profile. According to Robbins, between 65 to 70% of the Hyde/Jackson Square district's business owners are immigrants, with 80% of that group from the Dominican Republic. St. Mark's Area Main Street has a particularly engaged community, with six neighborhood associations in the one-mile stretch along Dorchester Ave. The Washington Gateway district, meanwhile, has an emerging cluster of young entrepreneurs – primarily in retail – along with a robust nonprofit community and thriving artist community. The Brighton district benefits from a range of large employers located in the

commercial district – like St. Elizabeth's Hospital and the Oak Square YMCA – and others right on the periphery, including Boston College, New Balance, and WGBH.

The districts range in size. St. Mark's Area Main Street has about 120 storefronts, while the Hyde/Jackson Square and Washington Gateway districts have about 130 to 140. The Brighton district is the largest, with about 180. Outside of St. Mark's Area, where there is a relatively high 14% vacancy rate, the districts have extremely tight vacancy rates: in the Brighton and Hyde/Jackson Square districts, it is around 2%, while in the Washington Gateway district it is around 5%. Interestingly, though, with the Main Streets model focused on ground-level storefronts, space located above the ground floor is not counted in this figure. This has a different impact depending on the neighborhood, though. Carter estimated that there are an additional 20 businesses on upper floors in the Brighton district, while Robbins said that all the upper floors in the Hyde/Jackson Square district were residential and that he did not know of any second-floor offices.

As for rents, the directors made clear that even within their districts, there are different price points; Overton also emphasized the difficulty of getting this data, as property owners can be reluctant to share. Effron estimated that retail rents (none of the directors had information specifically on office rents) in the Union Park area have risen to around $40 per square foot, with rents falling toward the Lower Roxbury part of the district. In the Brighton district, Carter estimated that typical rents are in the mid-$20s to low-$30s per square foot, although retail space in some new developments will lease for $35 per square foot. In the Hyde/Jackson Square district, Robbins emphasized that he hears a range of estimates depending who he talks to, but guessed that rents ranged from the high teens – primarily in Jackson Square for lessees with a long-term relationship with the property owner – to rents in the low-to-mid 30s for new businesses coming into Hyde Square.

Turnover in Washington Gateway seems to be highest among the three districts; as rents have increased the fastest, Effron has noticed that new business entrants tend to be higher end, along with more chains and franchises. St. Mark's Area has seen a wave of new businesses entering the area in the past ten years, with 40 new businesses since 2004, and 24 of those since just 2011 according to Overton's estimate.

5.3 Business Development and Organizational Capacity

As stated before, one of the four points for Main Streets organizations is promotion, and organizations do expend significant time and effort on hosting various neighborhood events to engage neighborhood residents and residents from other parts of the city. They do also work with businesses on façade improvement and improving the district streetscape. The two other goals of business development and organizational capacity building, though, seem to be increasingly important elements that these organizations are putting greater stock into, and which could facilitate more of a role for Main Streets in connecting with Boston's innovation economy.

In terms of business development, Main Streets organizations have traditionally worked with businesses in finding suitable space, navigating the City's permitting and licensing requirements – which all directors were in agreement needs reform – and helping businesses expand their operations in the district. Increasingly, though, these organizations are seeking to also increase opportunities for professional development, training, and networking.

Hyde/Jackson Square Main Streets recently held an event in conjunction with nearby Egleston Square Main Streets bringing together 40-60 local businesses for a series of workshops thematically organized on "The Changing Neighborhood" to give business owners opportunities to talk with each other about how to seize new business opportunities in the neighborhood. Robbins said he and his organization also played a role in resuscitating a defunct neighborhood business association, giving businesses more opportunities to share ideas and communicate

regularly. One of his main goals is to continue to expand access to training and networking, particularly nearby to the district so that business owners are more likely to attend, and perhaps getting funding for a part-time staffer to coordinate. In St. Mark's Area, Overton has similarly reconvened the Business Task Force, which brings business owners, residents, and elected officials together at different neighborhood meeting spots. She is working to attract more of the neighborhood's business owners to attend these events, and strategizing ways to add more value for attendees.

Brighton Main Streets is also zeroing in on training and networking opportunities, which Carter has said they have not focused on as much in the past and would like to ramp up. Carter connects businesses with trainings through the Small Business Administration, as well as the nearby Harvard Innovation Lab. At Washington Gateway Main Streets, Effron coordinates retailers meetings in her office every six weeks or so, to plan coordinated neighborhood retail efforts. The businesses themselves do the work of coming up with goals and strategies, but she serves as an important facilitator.

As the directors I interviewed emphasized their commitment toward increased business development, each also mentioned the increased collaboration amongst the different Boston Main Streets organizations. Each pointed to a collaborative effort among many of the organizations in 2013, coming together as the Main Streets Coalition to host a forum for the Boston mayoral candidates and presenting a list of 11 priorities for neighborhood business that the City should tackle – with major items including streamlining licensing and permitting, as well as expanding access to capital for small businesses. All the directors also meet bi-monthly at City Hall, and share information regularly via an online community and individually. Some of the common theme that came across around increased collaboration were the potential benefits of being able to access more funding opportunities, and the opportunity to do more activities at scale.

5.4 Innovation Connections

While many of the current businesses in these districts are oriented more toward local services, there is no reason that the same activities couldn't benefit new tech or creative firms entering these neighborhoods. One of Main Streets' great assets seems to be the ability to connect businesses to resources and to other businesses; the directors do not just send emails out to the businesses, but pound the pavement to form one-on-one relationships and build trust with business owners. The City also recently put out a new request for proposals to expand the types of training and business development services it makes available through the Main Streets organizations; expanding these offerings to include programs geared toward creative firms would be a relatively seamless way to integrate that activity into an existing framework.

Many Main Streets organizations also have existing relationships with large employers in innovation-intensive industries like healthcare, information services, education, and professional and business services, which could be built upon with an innovation district expansion. While the Hyde/Jackson Square district lacks significant large employers, both the Washington Gateway and St. Mark's Area districts have healthcare-specific connections. The Washington Gateway district is home to the Boston Medical Center and the Boston University Medical Campus; Effron meets regularly with the BU Medical Campus community outreach representative, and for many years had a BU representative on the Washington Gateway Board of Directors. Adjacent to St. Mark's Area is Carney Hospital, the largest employer in Dorchester and one that supports St. Mark's Area Main Street.

Brighton Main Streets has even more robust relationships with neighboring institutions. A representative from Boston College serves on the Brighton Main Streets board of directors, and Brighton Main Streets has a strong working relationship with the university. Boston College also has a neighborhood center in Brighton that Carter is often able to work with to secure student volunteers for community events. While Brighton Main Streets does not have a current

relationship with Harvard, Carter often refers businesses to the nearby Harvard Innovation Lab. Brighton Main Streets also has board members from nearby WGBH and St. Elizabeth's Hospital, along with a representative from the New Balance headquarters development (New Balance also provides financial support to the organization). These relationships with large institutions in the innovation economy could give the organization room to work in attracting new firms to the area.

5.5 Development Opportunities and a Role for Main Streets

The directors I spoke with each emphasized a range of conditions impacting the business environment in the neighborhoods, but a common theme was the development that is occurring in each neighborhood. In the South End, there is a new high-end luxury and condo development underway with an accompanying Whole Foods. A 10-story office building is also under construction in the neighborhood, which although it will expand the available office inventory, is expected to be priced out of reach for startups. Interestingly, though, under a community benefits agreement in the works, the developer has proposed utilizing some of the space as a business incubator, so that startups could access the neighborhood.

The Hyde/Jackson Square district and surrounding area has seen a spate of development recently, with new commercial space at 225 Centre Street opening this year, more housing on the way on Columbus Avenue, and even a community ice rink under construction. A series of new developments in St. Mark's Area have recently been completed, focused primarily around the Ashmont T station with significant station upgrades, streetscape improvements, and the opening of the Carruth Building, a development with 116 units of mixed-income housing and 10,000 square feet of ground level retail space.

Development under way in Brighton is concentrated on Western Avenue, with two recently completed commercial spaces available. The most significant project, though, is New Balance's new campus, a mixed-use development which, when complete, will include retail,

housing, a hotel, and a new commuter rail station. Although it will be situated just outside the official Brighton Main Streets area, Carter called the development a "game-changer" for business development in the area.

Transit was also a common theme, although its impact differed somewhat by neighborhood. Robbins believe that Orange Line access probably contributes to the area's vibrancy, but hopes to do a modal survey to quantify the impact. In the Washington Gateway district, Effron also believed that Silver Line access was a boon to area businesses, although she noted that that some business owners probably wished they were closer to a subway or light rail stop. In the Brighton district, there seems to be more auto-dependence, with quick access to the Massachusetts Turnpike. The area has bus service, but otherwise is fairly cut off from transit. The opening of the commuter rail station in a few years, though, will dramatically decrease the transit travel time to downtown and the Innovation District. St. Mark's Area enjoys direct Red Line access to South Station and a quick transfer to the Innovation District, but Overton noted that its impact on bringing foot traffic to the neighborhood itself is not as strong as if it were a transfer point.

Despite signs of optimism for the benefits that new creative firms could bring to the neighborhoods, there was some skepticism as well due to evolving market conditions. With rents already fairly high in parts of Washington Gateway, Effron was unsure of the economic conditions for startups in particular:

> It's a challenge; like in the Innovation District, when it gets so pricey, it's hard to attract new startups when it's really expensive. The startups crop up in places they weren't intended like Downtown Crossing, because that's where the rents are actually affordable. I think that because [the Washington Gateway district] is such an interesting, creative neighborhood, it's a great opportunity for those types of businesses, but I don't know if the economics of it would work out.

Carter sees potential, but thought that such growth might be limited more to the new developments in the area, and again, would not be cheap. In the Hyde Jackson/Square district, Robbins believes there is room for second and third story office development above existing one

story buildings, but that of course takes time. There was also some concern about the specific mix of these firms entering the neighborhoods, with a preference not for a cluster of tech startups alone, but innovative firms in a range of industries.

If this mix is right, though, the directors I spoke with said they would welcome innovation economy firms into the area, and believe that current neighborhood businesses would as well. Effron said that "if it brings street life, we always like it," and noted that the creativity of the people working at those types of firms can bring placemaking opportunities to the neighborhood. Robbins said his organization would like to work with anyone coming into the neighborhood, especially those bringing in jobs; new economic activity could go a long way in boosting daytime retail and restaurant demand, many of which don't even open until 5pm because there is just not enough foot traffic. Furthermore, Overton and Carter emphasized the skills and knowledge that these new firms could bring to the neighborhood, acting as another resource for existing businesses.

6. Conclusion

With the success of the Innovation District on the South Boston waterfront, and calls for creating innovation districts in other Boston neighborhoods – both to emulate that success and to hedge against rising cost pressures for entrepreneurs in the existing Innovation District – I examined two separate, but related, lines of inquiry in this thesis. First, I identified characteristics associated with the innovation economy, and looked at the intensity and spatial distribution of those characteristics throughout the neighborhoods of Boston. I then looked at a set of organizations – under the umbrella Boston Main Streets program – that work with businesses in most of the city's neighborhoods, to identify their existing connections with the innovation economy, better understand neighborhood-level business conditions, and gauge the organizations' thoughts on the potential for innovation district expansion in their neighborhoods.

Innovation Characteristics of Boston's Neighborhoods

The literature review revealed a range of characteristics associated with the innovation economy. Some of these, such as the specialization of the labor market and concentration of venture capital resources, were important but too regional in scope for this neighborhood focused analysis. Instead, four characteristics that could be measured at the neighborhood level were identified. These included existing innovative business activity, entrepreneurial environment, knowledge spillover, and catalyst opportunities.

Using Richard Florida's "Creative Class" definitions to analyze neighborhood business patterns, Fenway/Kenmore has the highest percentage of innovative business activity of all Boston neighborhoods. This is driven in large part by the concentration of healthcare employees at the Longwood Medical Area, along with the concentration of universities in the area. South Boston, home to the Innovation District, ranked fourth in this metric, behind Central Boston and

the South End. Unlike many Boston neighborhoods, though, South Boston was not led by employment in the healthcare and education sectors, but rather professional and business services, financial activities, and information services, all sectors where most tech-related and life sciences employment falls. Rounding out the top half of Boston neighborhoods in existing innovative business activity came Back Bay/Beacon Hill, Jamaica Plain, Allston-Brighton, and North Dorchester.

To gauge the entrepreneurial environment, a proxy of new business registrations was used for each neighborhood, looking specifically at businesses in the innovation rich industries of information services, financial activities, professional and business services, educational services, health care and social assistance, and arts, entertainment, and recreation. Five of the eight neighborhoods with the highest share of innovative business activity also were in the top half of neighborhoods, or very close, for entrepreneurial environment. Interestingly, though, by this metric, Fenway/Kenmore ranked second to last among Boston neighborhoods.

In terms of knowledge spillover – the opportunities for knowledge sharing and collaboration that drive innovation - most neighborhoods have at least one college or university, with only South Dorchester, East Boston, Jamaica Plain, Mattapan, Roslindale, and West Roxbury lacking one. Most of the innovative support organizations, including business incubators, accelerators, co-working spaces are concentrated in Central Boston, South Boston, and Back Bay/Beacon Hill, but four other neighborhoods have access to at least one. Outside the CBD core of Central Boston and Back/Bay Beacon Hill, only three neighborhoods – South Dorchester, East Boston, and the South End – have transit proximity of 30 minutes or less to the Innovation District (although South Dorchester's proximity depends on the less frequent commuter rail).

The City of Boston could also look to its inventory of property holdings as a potential catalyst in jumpstarting a neighborhood innovation district, for bringing in an incubator,

accelerator, or other innovation support organization. Looking at the City's published list of both commercial (office/retail) and industrial developable property, most property is concentrated in Roxbury, South Dorchester, and Mattapan. Some limited parcels are available in other neighborhoods, particularly Jamaica Plain, Hyde Square, Charlestown and East Boston.

Boston Main Streets

The commercial districts where the twenty independent Boston Main Streets organizations work are comprised primarily of small and microbusinesses – retail, restaurants, and local professional services, among others. Larger firms that drive much of the innovation employment found in Chapter 4 tend to be located adjacent to these commercial districts, but the Main Streets organizations I profiled – Washington Gateway Main Streets, Brighton Main Streets, Hyde/Jackson Square Main Streets, and St. Mark's Area Main Street – appear to work closely with these firms where possible. Some have representatives on their boards of directors, while others maintain regular communication through less formal working relationships.

While the Main Streets organizations continue to spend energy on the promotional and streetscape improvement activities that have been a hallmark of Main Streets, the executive directors I spoke with placed an emphasis on increasing access to training and networking opportunities to their district businesses now and into the future. The City of Boston – which provides much of the funding and technical support to these organizations – has recently initiated requests for proposals for new business training providers, to expand the range of opportunities available for businesses. Brighton Main Streets has referred businesses to programming at the Harvard Innovation Lab, while Hyde/Jackson Square has held recent networking events for neighborhood businesses and, like St. Mark's Area Main Street, played a role in reinstituting a neighborhood business association to regularize such interaction.

There seemed to be consensus that new innovative firms would have a place in these districts, particularly as potential drivers of more lively street life for other businesses in the

district, and that the Main Streets organizations would be interested in working with such firms. Still, vacancy in the majority of these districts is tight – between two and five percent – while inventory often limited to ground-level space (with upper-floor space often dedicated to housing rather than office space) dampening the rent discount the neighborhood can offer. There is significant new development that has recently been completed or is ongoing on in each of these neighborhoods, though, which could open up opportunities for these firms.

In terms of organizational capacity, the Main Streets organizations I spoke with seem to have good working relationships with the City, and while there was an emphasis that they are not an extension of the City, they may have an easier time cutting through bureaucracy. After limited collaboration between the organizations in the past, there appears to be more of a groundswell to coordinate, starting with the Main Streets coalition formed for the 2013 mayoral election, in which the organizations came together to advocate for a range of improvements that would strengthen their districts. This burgeoning infrastructure could be a strength as innovative firms locate in different neighborhoods, allowing for consistent strategies in working with those firms, and having those new firms also work with existing neighborhood businesses.

Policy Implications in Boston

In Boston, City officials have an opportunity – and responsibility – to be very intentional in the expansion of the innovation district model. When the model was introduced on the South Boston waterfront, there was little downside to the strategy. It was a novel idea that, if successful, could spark a transformation of the neighborhood; if it failed, though, officials would likely have just moved on to the next economic development strategy. Now that the innovation district model has thus far proven successful, however, I do not think that it can be treated as much like an experiment as the initial attempt in South Boston. That doesn't mean that the City shouldn't remain nimble and entrepreneurial as it expands the innovation district model, but that the City should be diligent in identifying where the model can best succeed.

I think there are a few steps the City can take to aid in this process. The City should immediately start engaging with residents and the business communities in Boston's neighborhoods about the concept. A neighborhood could be a good fit for the innovation district on paper, but if the local community is completely opposed, it will likely fail. An expansion into a more tightly-woven neighborhood than the South Boston waterfront will require even more work with existing community organizations and stakeholders, and more neighborhood-level knowledge about those business districts. Boston Main Streets organizations could help fill this need and be a valuable partner with the City in pioneering a new innovation district, while helping the Main Streets organizations drive new commercial activity to benefit the existing businesses in their districts.

To serve as an effective partner, though, the Main Streets organizations will need more money. Typically with just one employee – the executive director – each organization seems to be stretched thin. Mayor Walsh's announcement in April 2014 that the City would be increasing its funding to Main Streets organizations by 30% was a welcome sign. Despite the large percentage increase, though, this amounts to a total of just $75,000 per year allocated to each organization. This would likely allow organizations to hire one additional part-time staff member in addition to the executive director, but would still leave organizations very thin. Even if funding to all organizations cannot be increased further, I think there is potential to target additional funding toward organizations located in neighborhoods where an innovation district expansion would occur.

While the City should think big in terms of how to best use its resources to make the potential next innovation district a success, it should think small in terms of how many neighborhoods to target initially. After the community engagement process, I think the City should select one neighborhood as a new innovation district. This not only allows the City and a Main Streets partner to focus on the tasks at hand, but also sends a clear message to innovative

firms for location choice. There's a possibility that initially creating new innovation districts in multiple neighborhoods could dilute the pool of firms needed for a successful innovation district. While initially expanding to just one neighborhood, the City could nonetheless craft an implementation plan with additional phases, to scale the model over time and bring the model to another neighborhood or two.

Finally, the City should consider all factors contributing to the potential success of a neighborhood as an innovation district. While I looked closely at the existing innovative business patterns in each neighborhood, this is only one factor. Existing innovative business activity could certainly be augmented through the development of an innovation district, but even the South Boston waterfront wasn't initially the most innovative neighborhood. The South Boston waterfront benefited largely from to its proximity to downtown, improved transportation structure from the Big Dig, and available land that, over time, more developers and firms took a chance on, while the City gave a final push with the creation of the Innovation District in 2010. In East Boston – which ranked last in terms of neighborhood Creative Class percentage – a proposed extension of the Silver Line would take that transit line beyond Logan Airport and into the heart of East Boston. This would provide a direct connection to the Innovation District and potentially open up a wealth of development opportunity in East Boston. Other neighborhoods, like Brighton, provide a more balanced mix, with a relatively high Creative Class percentage, high number of new business registrations, and transit improvements already under construction.

Relevance Beyond Boston

While this thesis focused specifically on Boston, the methods employed can be used anywhere. Innovation is a term du jour in many cities, and I think the process of mapping out the innovation economy characteristics of a city, as done in this thesis, is a simple first step for cities to take. As opportunities around building a local innovation economy present themselves, cities that are well prepared can take better advantage of those opportunities.

The potential of partnerships between City Hall and neighborhood organizations focused on business development is another takeaway. While I profiled the Boston Main Streets organizations, other cities have similar nonprofits and other organizations focused on neighborhood business development. They may not be as ubiquitous as Boston Main Streets, but could serve a similar role in working with existing businesses, marketing districts to new businesses, and providing networking opportunities. Other cities could experiment with funding models approximating the Main Streets model.

Finally, it is worth noting that innovation is not a monolithic concept; there are a wide range of innovation drivers that cities can tap into based on whatever comparative advantage they may have. In Boston alone, there are different drivers by neighborhood, as some are driven by tech, others by life sciences, and still others by healthcare or education. Other cities may have even stronger bases in these industries, or may have strengths in other industries like the arts or advanced manufacturing that can drive a burgeoning local innovation economy.

Limitations and Future Research

There were some limitations of this thesis, primarily around data availability and methodology, which should be acknowledged. First of all, it became apparent early on in the process that much of the data typically used to look at innovation – particularly venture capital investment – is not available at such a granular, neighborhood level. Furthermore, as is often the case, some of the most current data I was able to utilize is already somewhat dated. This specifically applies to the 2011 Zip Code Business Patterns, which formed the basis of identifying each neighborhood's Creative Class. At the time of writing, this was the most current data available. The Economic Census could have provided even richer data, but the 2012 data (newest release) will only be fully available in February 2014.

A potential limitation with the Creative Class methodology became apparent in looking at the dominance of healthcare as an innovation driver in many of Boston's neighborhoods. While

healthcare is certainly a dominant industry in Boston, there are distinctions between large, research hospitals like Dana Farber and smaller hospitals like Carney Hospital that are focused more on routine care. I think that looking at businesses at the narrowest industry classification level helped account for some of this distinction in the thesis, but future researchers may want to look at other ways to control for different types of hospitals. Earlier, I also noted that in neighborhoods with a small total employment base, a hospital in the neighborhood will have a significant impact on the share of Creative Class employees in that neighborhood. This can potentially overstate the innovative business activity in a neighborhood. It might be helpful for future researchers to also account for the share of neighborhood employment coming from one large employer, and determine if, and how, that should be controlled for.

With regards to the interview process, it is worth noting that the interviews represent only a subset of all Boston Main Streets directors, and thus care should be taken as the findings are extrapolated. It was not feasible to speak with all twenty executive directors for this thesis, and it is possible that some of them may have had different responses to the interview questions. Still, by the fourth interview, it was apparent that while each director drew from his or her own particular experience, many of the responses echoed similar themes. I'm not sure how much more new information would have been gleaned from additional interviews.

Going forward, I think the innovation economy, particularly at the neighborhood level, is ripe for additional research. I acknowledged early in the thesis that there is a rich literature on innovation at the regional level, but very little on location choice of innovative businesses within a particular region. While this thesis focuses specifically on Boston, it would be useful to conduct similar analyses across a range of different cities, to not only see which neighborhoods could best support innovation in a given city, but also to compare cities with each other to better understand the drivers of innovation. In this thesis, I used the Creative Class percentage of Kendall Square to help frame the results in Boston, and a wider application to other cities could be similarly

beneficial. Furthermore, I expect that there are a range of other indicators that researchers could analyze to assess innovation at the neighborhood level.

The Road Ahead in Boston

The City of Boston has a wealth of opportunities to utilize the innovation district model in other neighborhoods. Each neighborhood has its strengths and weaknesses in accommodating such growth, though, and each will call out for a different policy approach and implementation strategy compared with what worked on the South Boston waterfront. This thesis is just one piece of an ongoing conversation in Boston, but can hopefully provide more context for policymakers to support the continued development of Boston's innovation economy.

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Appendix A: IRB Approval

OFFICE OF THE VICE PROVOST FOR RESEARCH

Social, Behavioral, and Educational Research
Institutional Review Board
FWA00002063

Title: Boston Main Streets 2.0: Spreading the Innovation Economy from the Innovation District to the Neighborhoods.

March 18, 2014 | Notice of Action

IRB Study # 1403016 | Status: EXEMPT

PI: John Taylor
Faculty Advisor: Justin Hollander
Review Date: 3/18/2014

The above referenced study has been granted the status of Exempt Category 2 as defined in 45 CFR 46.101 (b). For details please visit the Office for Human Research Protections (OHRP) website at: http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.html#46.101(b)

- The Exempt Status does not relieve the investigator of any responsibilities relating to the research participants. Research should be conducted in accordance with the ethical principles, (i) Respect for Persons, (ii) Beneficence, and (iii) Justice, as outlined in the Belmont Report.
- Any changes to the protocol or study materials that might affect the Exempt Status must be referred to the Office of the IRB for guidance. Depending on the changes, you may be required to apply for either expedited or full review.

IRB Administrative Representative Initials: M. LaVigne

20 Professors Row, Medford, MA 02155 | TEL: 617.627.3417 | FAX: 617.627.3673 | EMAIL: SBER@tufts.edu

Appendix B: Interview Questions

Background

- How long have you been the executive director of this organization?
- Were you involved with this organization, or elsewhere in this neighborhood, before becoming executive director?
- Can you tell me a little about your professional background before starting with this organization?
- What are the primary goals of your organization?
- What is your role in executing those goals?
- Are there any employees besides you? What role do they play?
- Does your organization have volunteers? What role do they play?

Members

- How many businesses are members in your Main Streets organization?
- What types of industries are they in? Are there certain types of business that are predominately represented?
- Have most businesses been located in this district for a long time?
- Is there a typical employment size, or does it range widely? Are any members large employers?
- Is there a typical demographic profile of the business owners? Young or old, male or female?
- Do most business owners live in the neighborhood?
- What about their employees?
- Are any businesses looking to expand?

Activities and Recruitment

- How do you recruit businesses to join?
- What types of activities does your organization engage in?
- How do you promote your district?
- What kind of networking activities for business owners? Do you have events for specific groups of businesses, or general events for all members?
- Do you provide trainings for business owners? What kinds?
- What are the benefits to businesses of membership in your organization?

Neighborhood and Business Environment

- What are the strengths of your neighborhood? Weaknesses?
- What is your sense of business conditions in the neighborhood? Are there trends you've noticed in terms of business formation and business success?
- What do you think attracts businesses to this neighborhood?
- Do you see new opportunities for business growth in the neighborhood?
- Do you think there is room for additional business growth?
- With the growth of the Innovation District, have you noticed any new startup activity spilling over into your neighborhood?
- Are there any business incubators or entrepreneurship training programs in the neighborhood that you're aware of?
- Do you have a sense of the amount of currently available office space?
- What is the going rent for office space in your district?
- How important is transit access in the strength of your member businesses?

Relationships and Financing

- What is your relationship with the City of Boston, both in operations and financing?
- How else do you finance your operations?
- Are there ways the City could provide additional support to you and other Main Streets organizations?
- Do you coordinate with other Main Streets organizations in the city?
- What relationships do you have with other community organizations in the neighborhood?
- Do you have any connections with local universities?

The Future of Main Streets

- Do you see any advantages of Main Streets organizations compared with more traditional neighborhood CDCs?
- In working with businesses, do you see any advantages of the Main Streets model as opposed to more centralized activity at City Hall?
- What are your goals for the organization in the next 5-10 years?
- If the City of Boston wanted to use the innovation district model in your neighborhood, do you see any specific opportunities?
- Do you think such an economic development strategy would benefit your members, with increased office employment potentially driving gains in retail, leisure and entertainment revenues?
- Do you see a potential role for your organization in working with new startups?