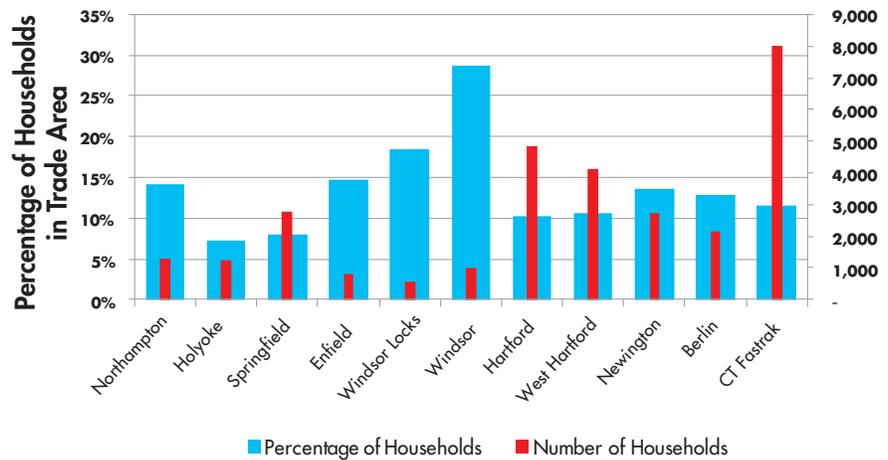


Figure 35: Households Able to Afford New Construction, Rentals



SOURCE: 2010 U.S. Census

The analysis indicates that the more urban stations - Hartford, Springfield and West Hartford - have a greater number of income qualifying households in their trade areas, even though in some cases the percentage of all renting households is lower. This implies that these locations may succeed in attracting renters able to afford the higher cost of new multifamily housing.

The CTfastrak corridor, as a whole, contains a large number of income qualifying households within its trade area. TOD within this corridor could potentially appeal to a larger pool of applicants, although it is assumed that many of these households overlap with the households captured in the Hartford, West Hartford and Newington trade areas.

Some station areas show high concentrations of higher-income renting population, which may indicate demand. Windsor and Windsor Locks both had high percentages of higher-income households within the renting population in their trade areas (29 percent and 18 percent respectively), but a relatively small renting population limited the number of income qualifying households (989 and 551 respectively). However, these data indicate that higher-income renters may be congregating in these locations and construction of new multifamily housing would attract more higher-income renters.

The Real Estate Feasibility Analysis provides a snapshot of today's market conditions compared with the costs to construct new housing and offers some indications of the latent demand for new housing that may exist in the vicinity of the station areas. This analysis, however, provides only limited policy direction; it only identifies locations where TOD may occur in the short-term and quantifies the level by which sales prices and rents would need to rise in order for TOD to become feasible. As the real estate markets in the transit corridors evolve in response to the improvements to transit service, TOD feasibility will increase. Likewise, in the TOD Strategies section, policies and implementation steps are discussed that would make TOD more broadly feasible throughout the transit corridors.

Connecticut River, Enfield, CT



Regional Economic and Commercial Real Estate Analysis

Just as the housing market has mostly seen development away from city centers, office and commercial development has been lacking in most of the station areas of the Knowledge Corridor. The segment of the Knowledge Corridor that is the subject of this analysis is overseen by three regional planning organizations: the Capitol Region Council of Governments (CRCOG), the Central Connecticut Regional Planning Agency (CCRPA), and the Pioneer Valley Planning Commission (PVPC).

The Consulting Team analyzed historical employment growth, identifying industries of strength in the region and focusing on TOD-supportive industries. In addition, the Consulting Team also mapped the spatial patterns of TOD-supportive industries in the region to understand the extent to which the new transit corridors aligned with these important sectors. This employment data is supplemented with commercial market information gathered for the corridors to provide insight on the market potential for office development along both alignments.

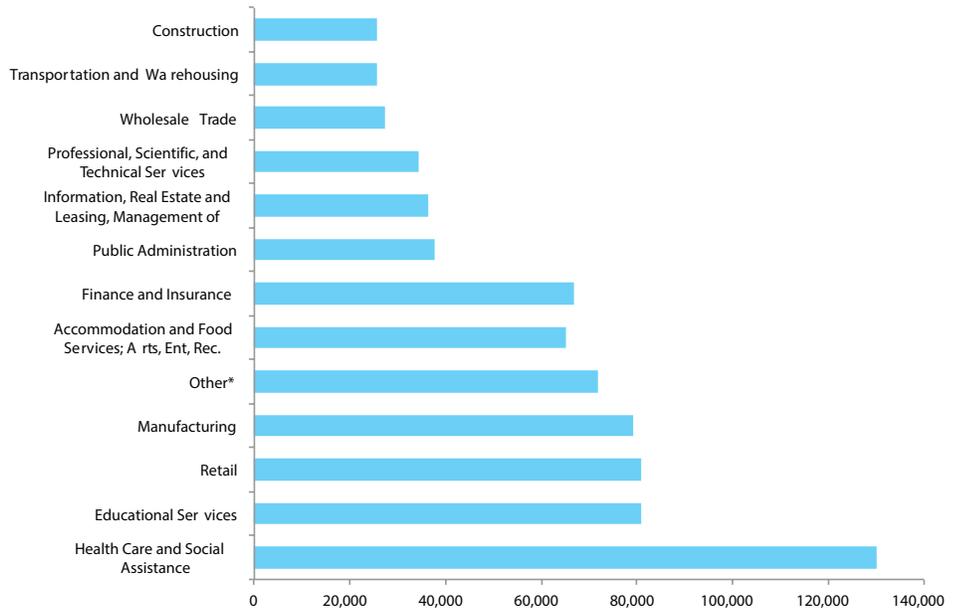
REGIONAL ECONOMIC OVERVIEW

The CRCOG/CCRPA/PVPC region's economy, which included 760,000 jobs in 2010, is diverse. The region's industry mix is diverse, with high shares of employment in sectors like health care, educational services, retail, manufacturing, and finance and insurance (Figure 36).

Employment trends in the region over the past decade reflect the nation's economic cycles. As shown in Figure 37, the region has experienced ups and downs in employment from 2001 to 2010, with dips during the economic recessions. The peaks and troughs of the cycles were less pronounced in the region compared to the United States, and employment remained in the range of 750,000 to 800,000 throughout the decade. Overall the region experienced a net job loss of about three percent from 2001 to 2010.

A significant amount of the region's employment losses were in Manufacturing and Other Industrial sectors. The greatest job declines from 2001 to 2010 were in manufacturing, which declined by 25 percent. Manufacturing's share of regional employment dropped from 13 percent to 10 percent. This sector fared better in the CRCOG/CCRPA/PVPC region than in the nation, where manufacturing employment dropped by about 30 percent. Other sectors with significant job declines in the region include Wholesale Trade, Construction, Utilities, Transportation and Warehousing, which declined by 17 percent combined.

Figure 36: Regional Employment by Industry, 2010



NOTE: Data for the CRCOG and CCRPA area is based on the boundary of the Connecticut North Central Workforce Investment Area.

SOURCE: Quarterly Census of Employment and Wages via: California Employment Development Department, 2012; US Bureau of Labor Statistics, 2012; Connecticut Department of Labor, 2012; Massachusetts Department of Labor and Workforce Development, 2012.

Figure 37: Historical Year-Over-Year Employment Growth in the Region and U.S.



NOTE: Data for the CRCOG and CCRPA area is based on the boundary of the Connecticut North Central Workforce Investment Area.

SOURCE: Quarterly Census of Employment and Wages via: California Employment Development Department, 2012; US Bureau of Labor Statistics, 2012; Connecticut Department of Labor, 2012; Massachusetts Department of Labor and Workforce Development, 2012.

The Health Care and Social Assistance sector experienced significant growth from 2001 to 2010, similar to national trends. Employment in Health Care and Social Assistance jobs rose by 17 percent, making this industry the largest industry in the region. At the sub-industry level, employment growth in this industry was highest for Ambulatory Health Care Services, followed by Social Assistance, Nursing and Residential Care Facilities and Hospitals.

Though Finance and Insurance industry's employment numbers have dropped over the last decade, the sector retains a high share of total regional employment. Finance and Insurance is heavily dominated by insurance carriers, which have been present in the Hartford-Springfield region for two hundred years. In the 2001 to 2010 period, the number of Finance and Insurance jobs declined by about seven percent. These losses are not entirely a product of the global financial recession of 2008; the region experienced losses in the sector even in the early 2000s, as large insurance companies consolidated and transferred activities to other locations, in many cases resulting in worker layoffs.²⁹ Even as the industry has experienced declines in employment, it still plays an important role in the region, accounting for about nine percent of all jobs in 2010.

The number of jobs in Professional, Scientific, and Technical Services (PSTS) remained stable during the last decade. In spite of the magnitude of the 2008 recession, the PSTS sector was able to hold steady, and now accounts for a larger share of the region's total employment (about five percent in 2010).

ECONOMIC DRIVERS

There are a number of heavily concentrated industries that drive much of the region's economic activity. Many of these industries generate "multiplier effects" through the purchase of equipment and services from suppliers, and employee spending.³⁰ As shown in Appendix E, industries with the strongest concentrations, or largest location quotients³¹ (LQ), in the region include: Finance and Insurance (LQ of 2.05), Health Care and Social Assistance (1.21), Other Services (1.23), Manufacturing (1.15), Educational Services (1.12), and Management of Companies and Enterprises (1.07).

Detailed analysis at the sub-industry level (three-digit NAICS codes) shown in Appendix E provides more detail on the types of businesses that are clustered in the region. The highest location-quotient sub-industries include

29 Levin, A.J. (2005). Will Consolidation of the U.S. Life Insurance Industry Continue? *Federation of Regulatory Counsel, Inc. Journal*, Vol. 16, ed. 2.

30 The "multiplier effect" refers to the broader economic effects generated by the recirculation of spent dollars within the regional economy. For example, a dollar paid to a manufacturer benefits not only the manufacturing company, but is also used to pay its suppliers and employees, who in turn spend on employees, other suppliers, and household goods, entertainment, etc. All industries generate multiplier effects regardless of concentration, though the more heavily concentrated industries have a relatively larger impact and are more likely to attract spending from outside the regional economy (rather than re-circulating dollars within the regional economy).

31 In this report, concentrations are measured by comparing regional industry employment concentration to national industry employment concentration, with the results expressed as a "location quotient." A location quotient above 1.0 indicates greater concentration relative to the United States. A location quotient of less than 1.0 indicates lower concentration compared to the overall U.S. economy.

Figure 38: Concentration and Growth of Industries in the Region

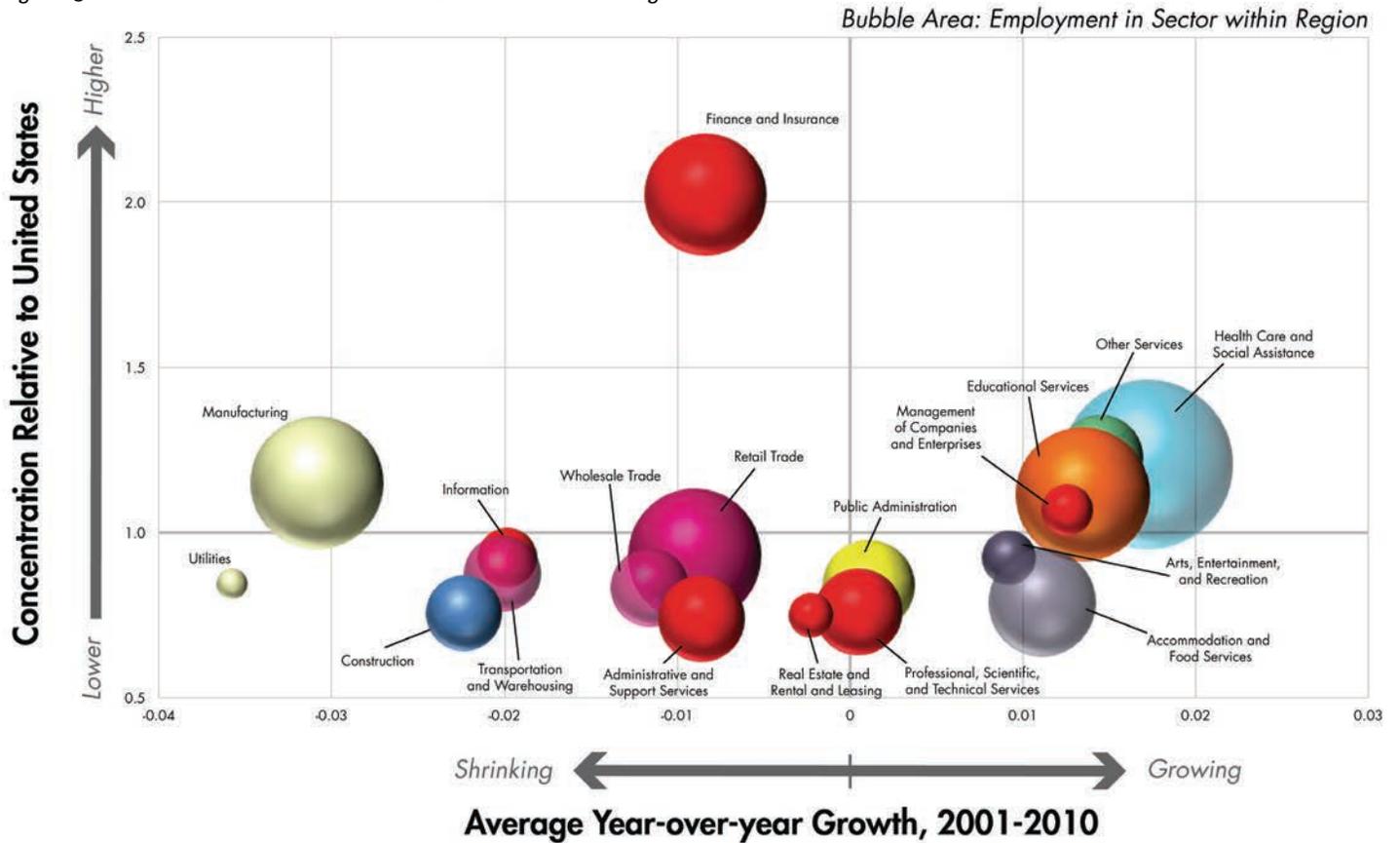
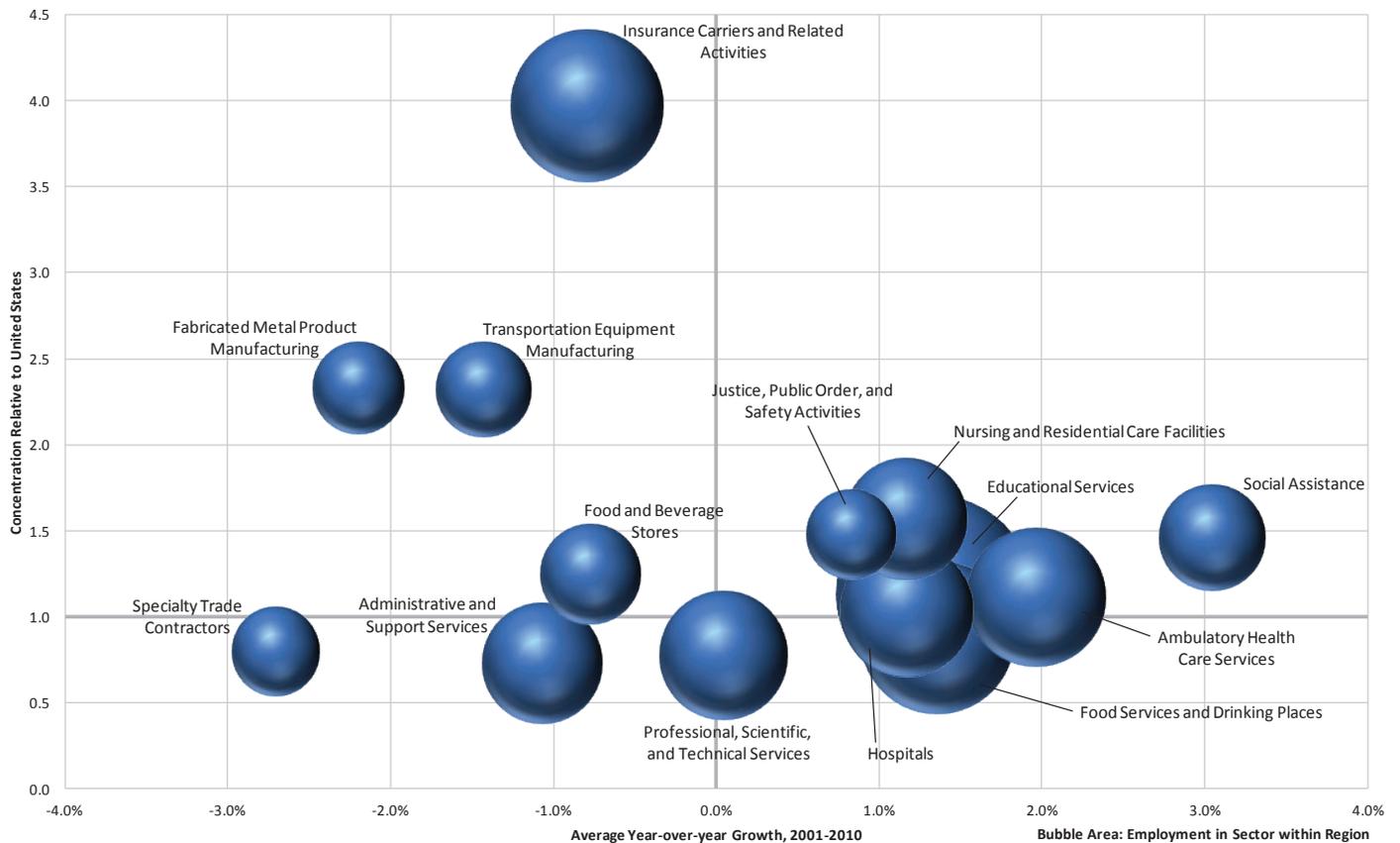


Figure 39: Concentration and Growth of Sub-Industries in the Region



SOURCE FOR FIGURES 7 AND 8: Quarterly Census of Employment and Wages via: California Employment Development Department, 2012; US Bureau of Labor Statistics, 2012; Connecticut Department of Labor, 2012; Massachusetts Department of Labor and Workforce Development, 2012.

Insurance Carriers; Manufacturing of Equipment and Machinery; and Nursing and Residential Care Facilities.

Figures 38 and 39 illustrate the size, relative concentration, and historical growth trends of each industry or sub-industry in the region. The size of each “bubble” corresponds to the size of employment in the industry. The location quotient is mapped on the y-axis, while the historical growth rate from 2001 to 2010 is shown on the x-axis. Industries and sub-industries in the upper right quadrant are those that have a relatively high concentration and have shown growth in recent years, while industries/sub-industries in the lower left quadrant are industries that are not concentrated and have experienced job declines. The analysis of location quotients and growth trends lead to the following conclusions:

Insurance is the most concentrated industry in the region. As shown in Figure 38, the Finance and Insurance sector is twice as concentrated in the region compared to the United States; no other industry sector approaches this level of concentration in the region. The sub-sector “Insurance Carriers and Related Activities” has a location quotient of 4.0. The large amount of headquarters employment makes this one of the most significant industries in the region in terms of the depth and breadth of its impact on the economy. As discussed above, while this sector has not experienced growth in the last decade, it continues to be a large employer and generates higher than average wages.

Manufacturing remains an important industry in the region, even as the number of employees in this sector is in decline. According to business and economic development representatives, the region still contains a significant cluster of aerospace and precision metal manufacturers. This is supported by the employment data showing strong concentrations in Transportation Equipment Manufacturing, Fabricated Metal Product Manufacturing, and Machinery Manufacturing. Average wages in these subsectors are well above the overall regional average. This sector has an important ripple effect through the rest of the economy. It is estimated that in the State of Connecticut, the manufacturing sector generates a multiplier of 1.35 in other sectors.³²

Educational institutions play a critical role in supporting the region’s knowledge-based economy. There are many high-quality four-year colleges and universities, as well as two-year colleges and training schools present in the region, with a 1.1 location quotient (Figure 38, included in Educational Services). These institutions support the Knowledge industries in the region, and attract highly talented faculty and students from all over the country and the world, helping to foster a highly educated workforce.

Health Care and Social Assistance activities are concentrated and growing in the region. This sector has particularly high employment

³² Connecticut Business and Industry Association. (2012). Connecticut Manufacturing: Building on the Past, Creating our Future. (Report.) Hartford, CT.

concentration in Residential Care Facilities, Social Assistance, and Ambulatory Health Care Services (outpatient services and medical offices. see Figure 38). The region's strong health institutions help to support a growing bio-medical products industry in the region, which includes the manufacturing of devices and equipment,³³ as well as research and development activities in conjunction with the universities. Wages in the health care sectors are also above the average for the region.

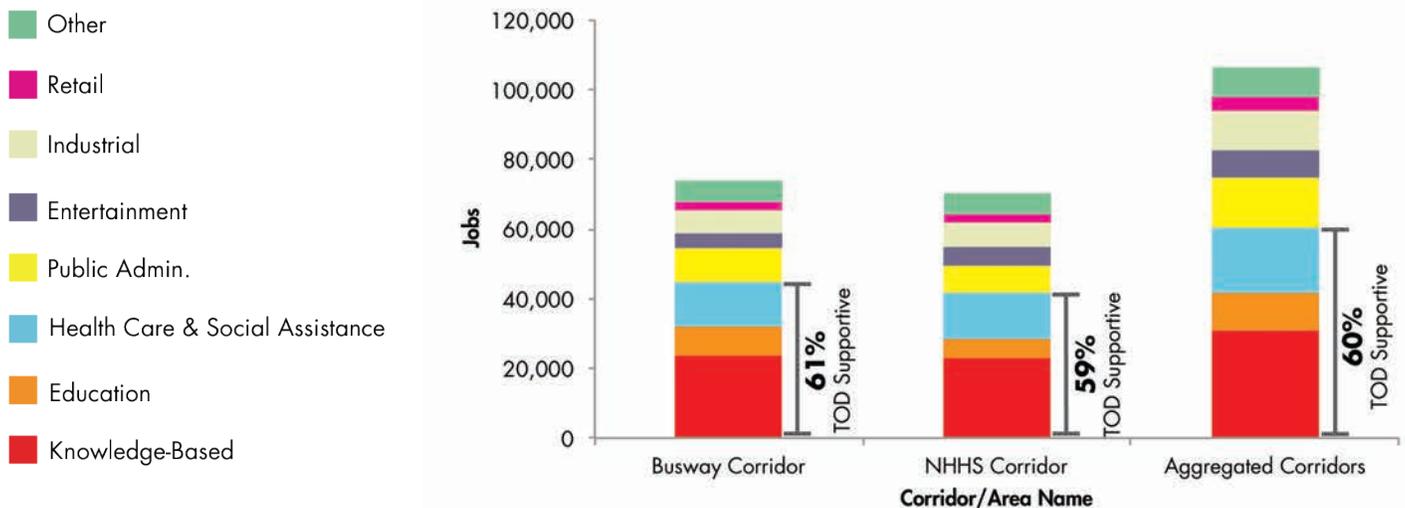
TOD -SUPPORTIVE INDUSTRIES

TOD-supportive industries currently account for almost 60 percent of total employment in the region's BRT and rail corridors. The BRT and rail corridors are defined as the area within a one-half mile radius of station areas. The employment analysis summarized above, and in Figure 40, indicates that the region has existing strengths in many of the TOD-supportive sectors, including Knowledge-based, Health Care Services, Educational Services, and Public Administration.

Approximately 19% of employment in TOD-supportive industries is already located in the transit corridors.

TOD-supportive industries, namely the Knowledge-based and Educational/Health Services sectors, are expected to drive national employment growth over the coming decades nationally. The U.S. Bureau of Labor Statistics projects that Knowledge-based employment will increase 16 percent between 2010 and 2020 and Educational and Medical Services employment will increase 33 percent, while total employment is expected to increase by 14 percent.³⁴ Given the region's existing strengths in these sectors, it is likely that they will continue to grow and generate demand for new space in the long term.

Figure 40: Employment on Corridors by Sector

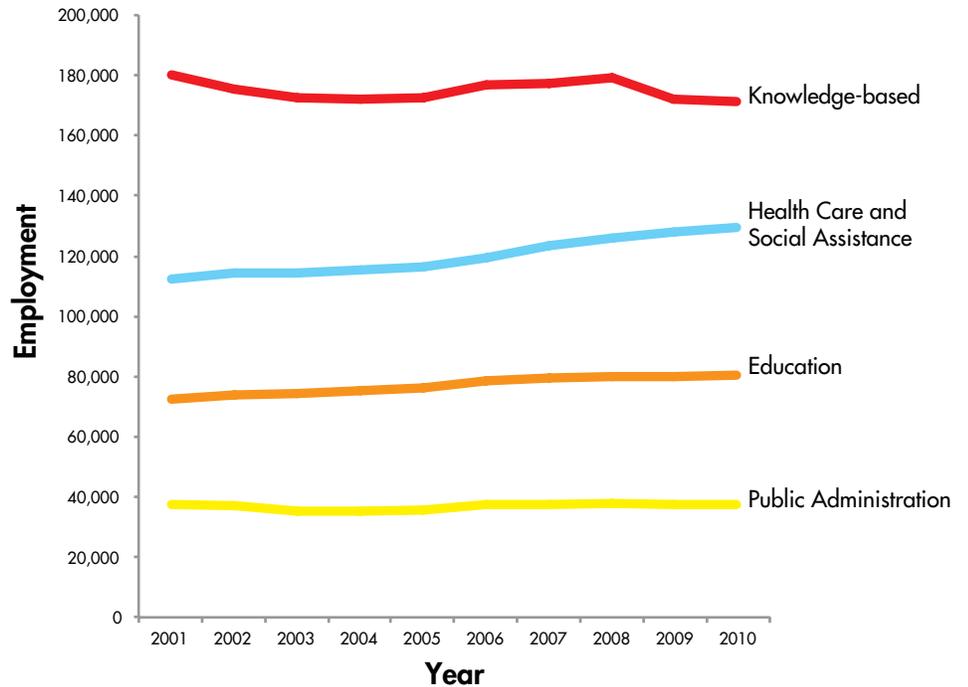


SOURCE: LEHD, 2009; InfoUSA, 2011; PVPC, 2011; Strategic Economics, 2012.

33 Pioneer Valley Planning Commission. (2012). The Pioneer Valley Plan for Progress: The Region's Comprehensive Economic Development Strategy. (Report.) Springfield, MA.

34 Employment Projections Program, U.S. Department of Labor, U.S. Bureau of Labor Statistics, 2012.

Figure 41: Employment in Region, by TOD-Supportive Industry Group



SOURCE: Quarterly Census of Employment and Wages via: California Employment Development Department, 2012; US Bureau of Labor Statistics, 2012; Connecticut Department of Labor, 2012; Massachusetts Department of Labor and Workforce Development, 2012.

COMPARISON TO PEER REGIONS

In order to provide context for assessing the potential for transit-oriented development in the CRCOG/CCRPA/PVPC region, Figure 42 compares the existing conditions along the proposed transit corridors to three peer regions: Cleveland, Pittsburgh, and Charlotte. These regions were found to be similar to the CRCOG/CCRPA/PVPC region based on their size and economic characteristics. All of the peer regions are within a similar range in size, with 750,000 to 950,000 households and 800,000 to one million jobs.

Like the CRCOG/CCRPA/PVPC region, the Cleveland and Pittsburgh regions contain a strong concentration of medical and educational institutions, many of which are present in their transit corridors. The anchor institutions have been key partners, along with the local governments, transit agencies, business leaders, and nonprofits in the implementation of transit-oriented development. For example, Cleveland’s new BRT line that opened in 2008 connected the region’s major employment centers along Euclid Avenue. Two of the major employers on the corridor, Cleveland Clinic hospital and Cleveland State University, redesigned their campuses to better integrate with the transit street, and the Cleveland Clinic partnered with University Hospital to rebrand the corridor as the “HealthLine.”

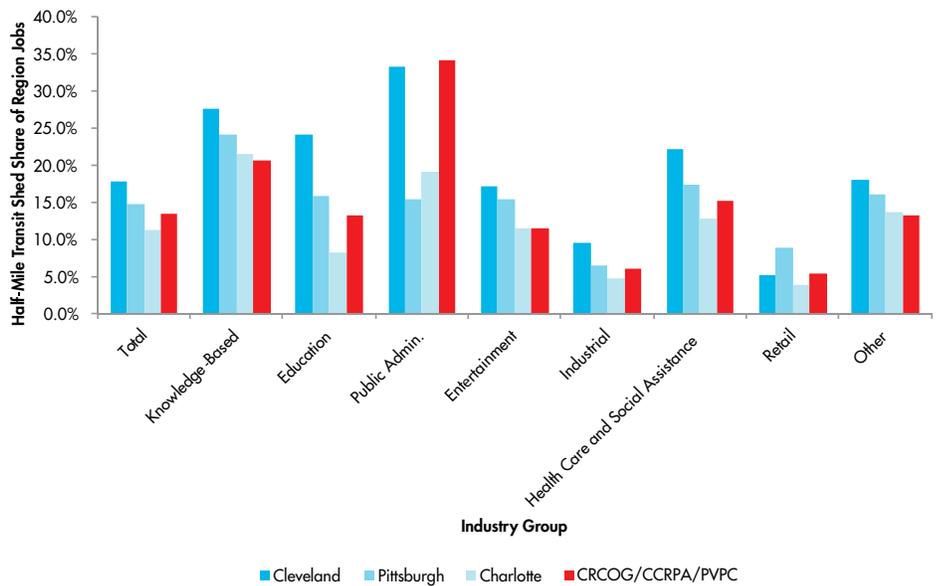
Charlotte, meanwhile, has a strong concentration of knowledge-based jobs like the CRCOG/CCRPA/PVPC region, specifically in the finance sector. The region’s recently opened light rail corridor, the Blue Line, effectively connects the city’s major employment hub containing the knowledge-based jobs, known as the Uptown. After opening in 2007, the light rail station areas in and adjacent to the Uptown district experienced a significant amount of new transit-oriented development projects.

Figure 42: Demographic Comparison of Peer Regions

	Cleveland, OH	Pittsburgh, PA	Charlotte, NC	CRCOG/CCRPA/PVPC
Population	2,178,737	2,287,344	1,947,783	1,905,323
Households	894,256	972,914	744,957	741,624
Employment	965,633	1,058,237	833,989	761,093

The similarities between the CRCOG/CCRPA/PVPC and peer regions show that the Hartford-Springfield rail and BRT corridors have many of the characteristics that have led to success in implementation of TOD in other places. Specifically, the share of regional jobs near transit is similar to other peer regions, as shown in Figure 43. Cleveland, Pittsburgh, and Charlotte have similar “capture rates” of jobs near transit, ranging from 11 percent in Charlotte to 18 percent in Cleveland. For all of the regions, the share of knowledge-based jobs near transit is similar, ranging from 21 percent in the CRCOG/CCRPA/PVPC region to almost 28 percent in Cleveland. However, the percentage of public administration jobs is the highest in the CRCOG/CCRPA/PVPC region, largely due to the fact that the corridors encompass a state capital. The share of jobs in the educational services and health care services in the CRCOG/CCRPA/PVPC region is average compared to peer regions. Another promising indicator is the similarity in types of jobs that are located near transit. The Knowledge Corridor has a strong concentration of knowledge-based and health care jobs much like the peer regions. The industry mix in the Knowledge Corridor is very similar to Cleveland.

Figure 43: Share of Employment Near Transit Compared to Peer Regions

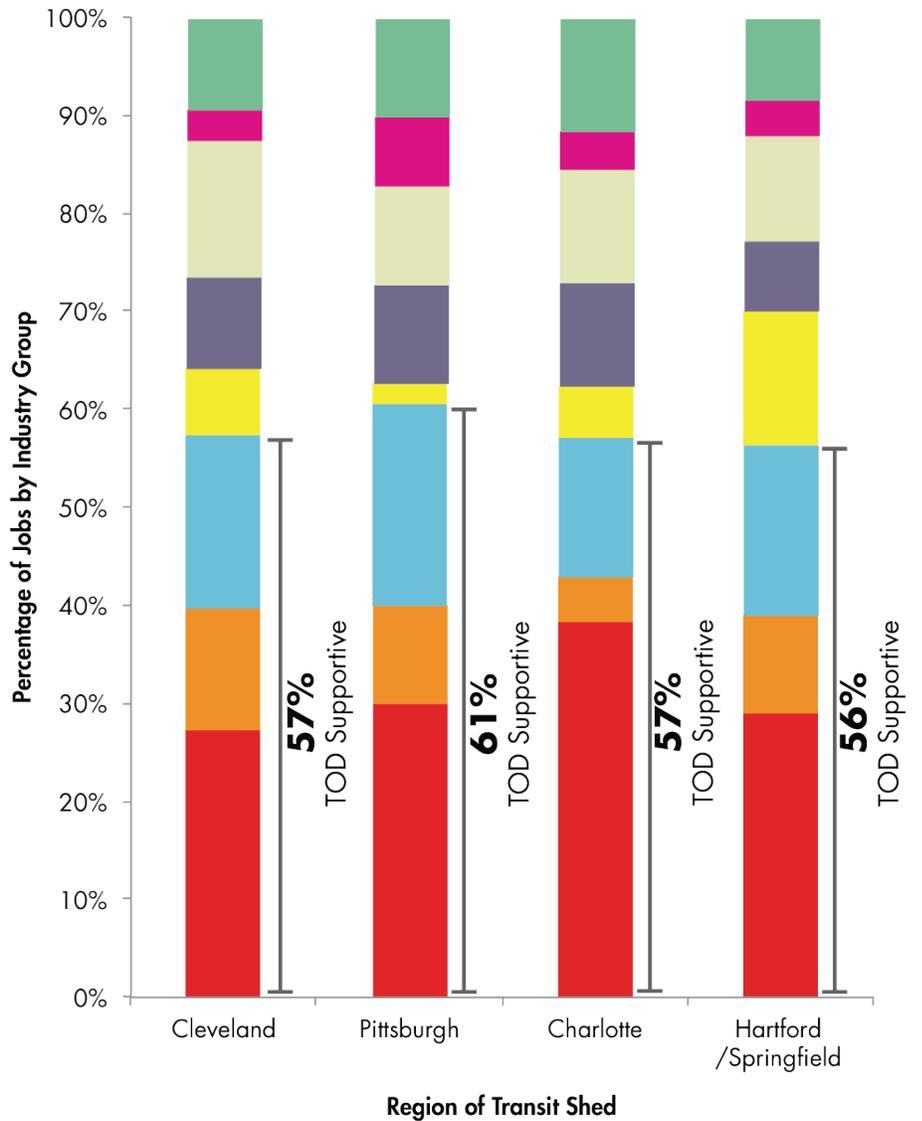


SOURCE: LEHD, 2009; InfoUSA, 2011; PVPC, 2011; Strategic Economics, 2012.



Figure 44: Mix of Jobs Near Transit

- Other
- Retail
- Industrial
- Entertainment
- Public Admin.
- Health Care & Social Assistance
- Education
- Knowledge-Based



SOURCE: LEHD, 2009; InfoUSA, 2011; PVPC, 2011; Strategic Economics, 2012.

SPATIAL PATTERNS IN EMPLOYMENT

The transit investments will connect the region's densest regional employment centers in Hartford and Springfield by rail, and other major employers and institutions in the region will be connected to Hartford by the BRT. As shown in Figure 40, the transit corridors are estimated to contain about 107,000 jobs, corresponding to 13 percent of the region's total employment. The spatial distribution of jobs in the region, and for various sectors, is shown in Appendix C.

More important for TOD potential, many of the region's transit-supportive jobs are located near transit. As shown in Appendix E, approximately 19 percent of employment in TOD-supportive industries are already located in the transit corridors. The corridor is particularly strong in attracting public administration and knowledge-based jobs, capturing 34 percent and 21 percent of jobs in those sectors, respectively.

The region is anticipated to have continued, modest growth over the next three decades. According to long-term projections by CRCOG, CCRPA and PVPC, the region is forecast to add approximately 89,000 jobs³⁵ by 2040, at an average annual growth rate of 0.40 percent.

COMMERCIAL REAL ESTATE MARKET CONDITIONS

The Consulting Team looked at two major commercial sectors in the region: (1) Office, which is the major employer and business tax revenue base in the region; and (2) Governmental and Anchor Institutions, which are the major governmental offices, as well as public and private institutions, such as universities and colleges. The Consulting Team chose these sectors based on research into TOD, which indicates that access to high-density employment is a main driver for new development along transit corridors,³⁶ and these sectors are traditionally associated with high-density employment.

Office Sector

The location of knowledge sector employment is highly correlated with the location of commercial offices in the region, because knowledge sector industries locate in office buildings. Appendix C shows a significant concentration of knowledge sector employment in Hartford and Springfield, but also a large amount of employment in suburban areas west and north of Hartford, in and around Northampton, and in further outlying towns such as Bristol and Southington. Employment patterns also follow the major highways, with concentrations of office employment along the I-91, I-84 and Rte. 2 corridors in Connecticut, and along the I-91 and I-90 corridor in Massachusetts.

Recent trends in the Hartford / Springfield office market indicate high vacancy rates, stationary rental rates, and little new construction.

According to data from Cushman Wakefield³⁷:

³⁵ For purposes of the employment projections, the approximate CRCOG, CCRPA and PVPC region is defined as the non-jurisdictional boundaries of Hartford, Tolland, Hampden, and Hampshire Counties.

³⁶ Center for Transit-Oriented Development. (2011). *Rails to Real Estate: Development Patterns Along Three New Transit Lines*. (Report.) Oakland, CA.

³⁷ Cushman & Wakefield. (2012). *Market Beat Office Snapshot*, Hartford, CT, 1Q



Massachusetts Green High Performance Computing Center , Holyoke, MA



- Office vacancy rates in the region have remained stationary at around 20% for over a year and direct vacancy rates have risen from around 16% in 2007 to close to 18.4% in Q1 2012. Direct vacancy is the amount of office space that is unleased, whereas total vacancy factors in leased vacant space.
- Office asking rents have been nearly stationary at approximately \$19-20 per square foot in the Hartford region and at \$14-18 per square foot in the Springfield region.³⁸
- Only 31 percent of the Hartford region's total office square footage is located in the Hartford CBD and 38 percent of the Springfield region's total office square footage is located in the Springfield CBD.
- There is only 13,000 Square Feet (less than 0.01% of total) of new space under construction in the Hartford region the first quarter of 2012 and 36,500 (less than 0.01% of total) completed in 2011.

The downtown Hartford office market, in particular, suffers from significant market challenges, but may be poised for a comeback in coming years:

- The recent sale of CityPlace I, a Class A property 98% occupied by credit-worthy tenants for \$112 per square foot indicates the infeasibility of new office construction, which costs upwards of \$300 per square foot, according to stakeholder interviews. However, this transaction also indicates an increase in commercial transactions and other downtown properties are expected to transact in the near future, which indicates a growing investor appeal.³⁹
- Values of the largest downtown Hartford office towers declined by at least 15% over the past five years.
- Downtown Hartford office vacancy is currently 27% and absorption of space has been negative for over one year.
- Major employers in the downtown market continue to shed employees, led by The Hartford, which has cut 2,200 jobs in Connecticut, or about 17 percent of its home-state workforce, from the Third Quarter of 2008 to October, 2011.

³⁸ Macmillan, Douglas. (2012.) Greater Springfield's Office and Industrial Marketplace Reflects on a Year of Increased Activity. (Article.) New England Real Estate Journal.

³⁹ Bordonaro, Greg. (2012.) Office Market Rebound. (Article.) Hartford Business Journal. Com. <http://www.hartfordbusiness.com/apps/pbcs.dll/article?AID=/20121001/PRINTEDITION/309289962> (Accessed October 10, 2012)

However, there are actions underway to reduce downtown Hartford's inventory of vacant office space. There is interest from the State of Connecticut in consolidating state agency offices out of the older structures along Bushnell Park and into newer, vacant buildings in downtown Hartford.⁴⁰ The second part of this plan would be to then redevelop the structures along Bushnell Park as market-rate housing, which would reduce downtown Hartford's inventory of vacant office space. Additionally, the University of Connecticut recently announced it would relocate its West Hartford campus to downtown Hartford in an effort to fill vacant office space.⁴¹ The long-term result of these efforts to reduce office vacancy will be to match demand and supply, which will lead to healthier market conditions and substantial market improvement in coming years.

Much of the office space in the region is located in areas not accessible to the new transit service. Automobile-oriented regions such as the Farmington Valley, Manchester and Glastonbury, and interior sections of Windsor and Bloomfield contain significant concentrations of office space and employment. In addition to the regional sprawl of office space, the trend over the past 30 years has been construction of new office space in suburban areas of the region and away from the transit corridors. According to a report from Connecticut Economic Research Center (CERC) describing employment gain/loss by town from 1980 to 2004, the greatest change in Hartford County occurred in the following towns:

- Farmington gained 12,723 jobs (78 percent increase)
- Manchester gained 9,275 jobs (48 percent increase)
- Glastonbury gained 8,406 jobs (125 percent increase)
- Hartford lost 28,536 jobs (20 percent decrease)
- East Hartford lost 16,855 jobs (36 percent decrease)
- Windsor Locks lost 1,958 jobs (12 percent decrease)⁴²

Many NHHS Rail and CTfastrak station areas have lost employment since 1980. The data indicate that many of the towns where stations will be located lost employment, including Hartford, New Britain, West Hartford, and Windsor Locks, while the greatest growth in employment occurred in towns not connected to transit. In the near term, these trends discourage the feasibility of new commercial space in the station areas, because the long-term trend of firms moving away from the locations where transit service will run has resulted in a depressed demand for office space in the transit corridors.

Both NHHS Rail and CTfastrak corridors connect to significant employment nodes in the major urban centers. Analysis of employment at the NHHS rail and CTfastrak stations indicates that the CTfastrak system connects to more employment centers, particularly in Hartford and New Britain, and indicates little employment at any of the NHHS rail stations outside of Hartford and Springfield.

40 Ibid.

41 Megan, Kathleen and Gosselin, Kenneth R. (2012.) UConn to Move its West Hartford Operation to Downtown Hartford. (Article). The Hartford Courant.

42 Connecticut Economic Research Council, Inc. (2006.) Employment Growth in Connecticut's Towns Since 1980. (Report). Connecticut Economic Research Council, Inc.

UConn Health Center, Farmington, CT



Central Connecticut State University, New Britain, CT



The Government and Anchor Institutions Sector consists of employers with a different set of objectives than traditional Office Sector employers, that is for- and non-profit businesses. The Government and Anchor Institution sectors tend to be more committed to a particular location than Office Sector employers, because of their deep ties to particular communities and large capital investment in campuses. These institutions are more likely than Office Sector employers to respond to policy and social objectives, such as TOD, which make them critically important to the future development of the transit corridors.

- The **Government Sector** consists of state government offices, which are generally concentrated around the state capital with smaller state offices located in other urban centers.
- The **Anchor Institutions Sector** includes education and health institutions, such as colleges, community colleges, universities, and hospitals. This sector also includes major regional corporations, such as Aetna, MassMutual, and the Hartford. These institutions often have a long history and significant real estate investment in one location, with a social mission of serving the local community.

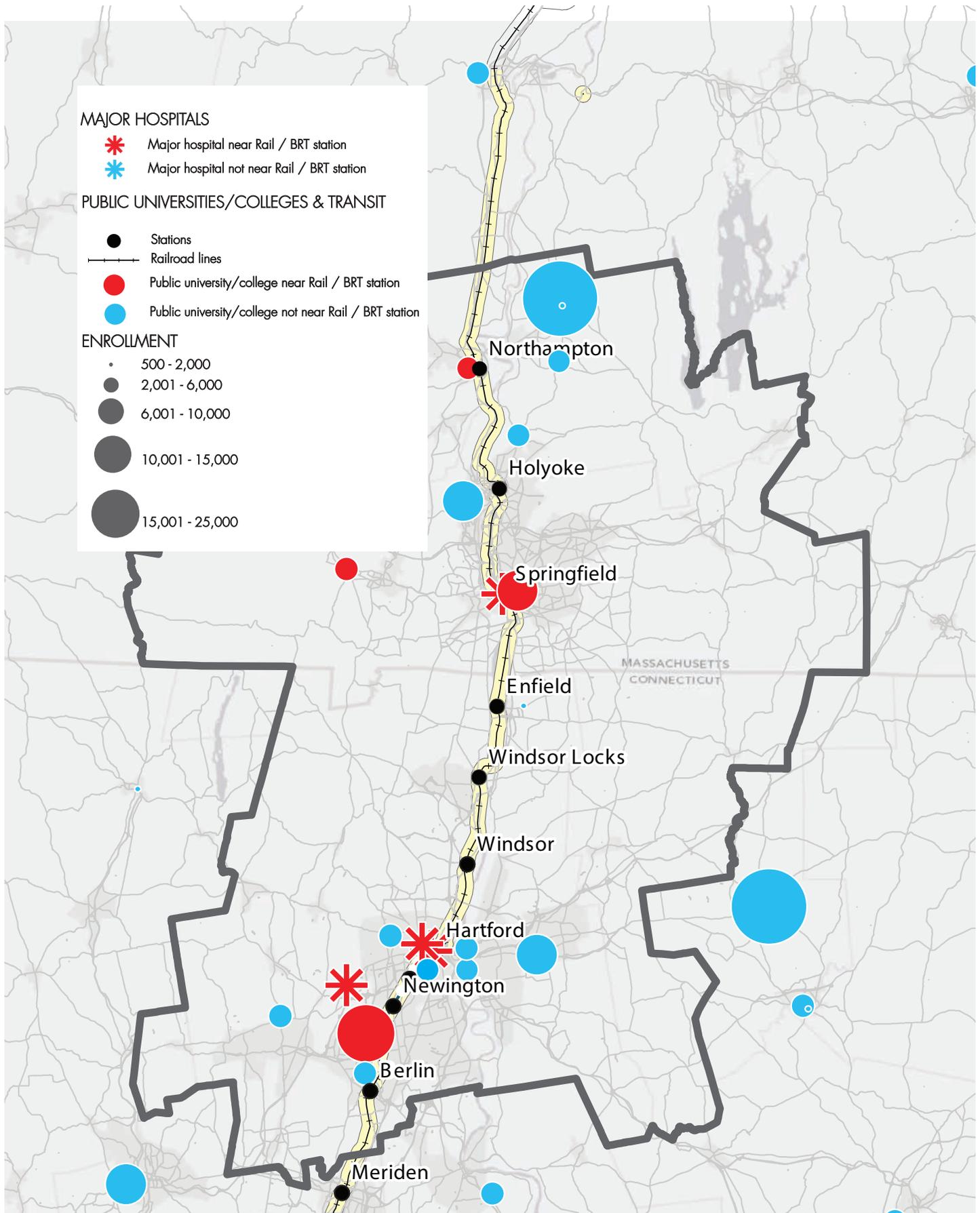
The Government Sector is concentrated in downtown Hartford, but a substantial amount of State of Connecticut leased office space is found in non-transit-oriented locations. The Government Sector is particularly concentrated in Hartford, which is the center of Connecticut state government, and in adjacent municipalities. As of 2005, the Government Sector constituted 25 percent of the City of Hartford's employment, making it the City's largest employer⁴⁵.

Although the Government Sector contributes greatly to the amount of employment at the Station areas, as described in earlier sections of this report, there are significant concentrations of Government employment that are not transit-oriented. As shown in Figure 45, most Connecticut leased state government offices are not located within a half-mile of a future station stop and many are instead located adjacent to I-91 or I-84. These government offices account for several hundred thousand square feet of regional office space and thousands of jobs.

Health-related anchor institutions are heavily concentrated in Hartford and Springfield, constitute primary employers in both cities, and are expanding. Within the transit corridors, Hartford and Springfield both contain large hospital complexes: Hartford Hospital and St. Francis Hospital in Hartford and Baystate Medical Center and Mercy Hospital in Springfield, which are significant employers. There are smaller hospitals in New Britain and Northampton. Hartford Hospital employs over 7,000 and has a medical staff of over 1,000 active staff physicians, St. Francis Hospital in Hartford employs over 4,000. Baystate Health System employs 10,000 and Mercy

⁴⁵ Connecticut Economic Resource Center. (2012.) 2012 Hartford Town Profile. (Report). Connecticut Economic Resource Center.

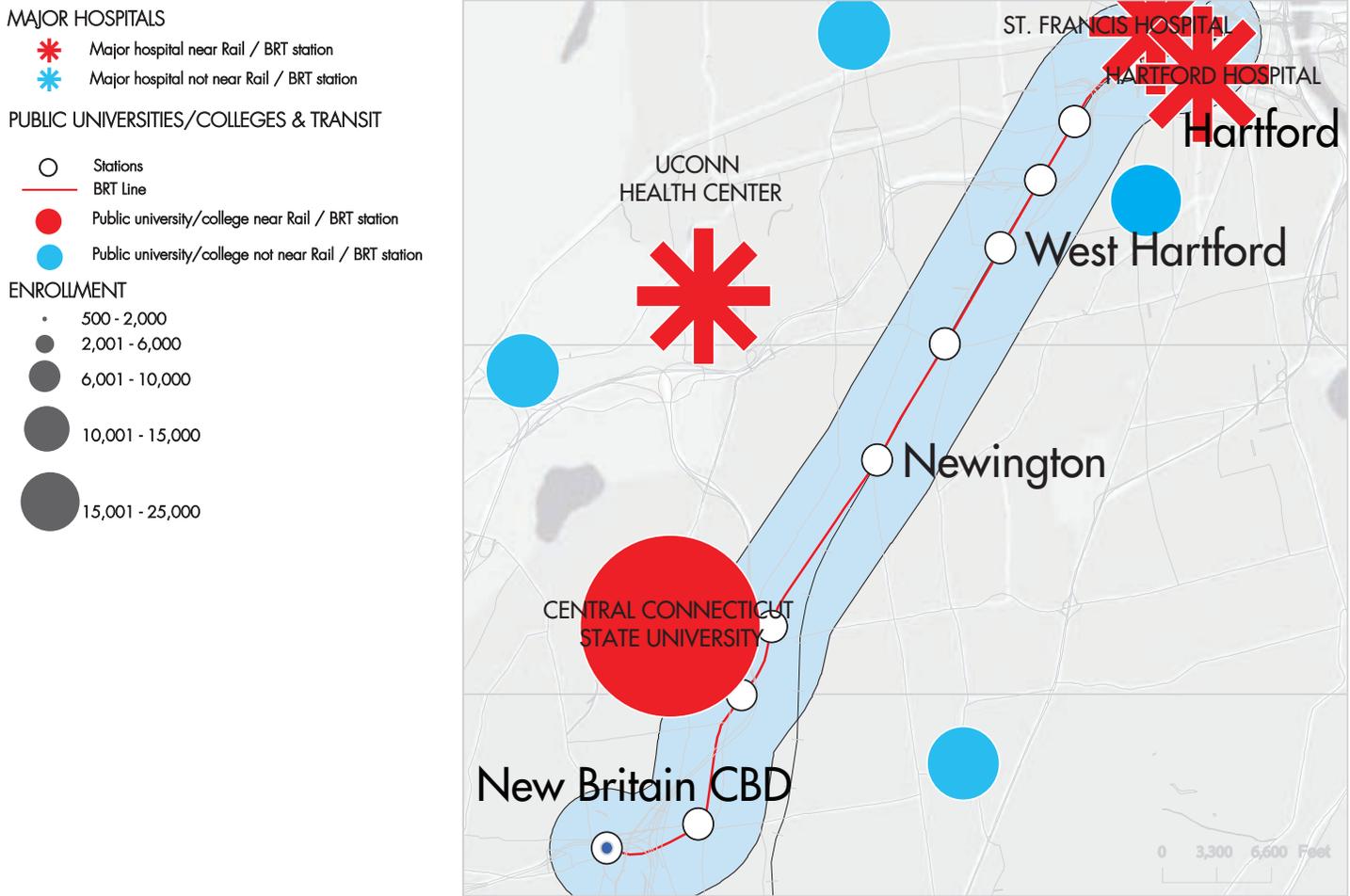
Figure 45: Major Regional Anchor Institutions



Hospital employs 3,000 in Springfield.⁴⁴ Appendix C indicates these major concentrations of health sector employment in Hartford and Springfield, but also indicates smaller concentrations of health sector employment near the New Britain, Enfield, Holyoke, and Northampton station areas.

The UConn Health Center is an important, growing node of health sector employment and bioscience, which will be linked to the CTfastrak corridor. The UConn Health Center in Farmington, which will be connected to the CTfastrak via a local loop at the Elmwood Station in West Hartford, is quickly becoming a regional health and bioscience node. The UConn Health Center complex will soon expand to include the new home of Jackson

Figure 46: Major CTfastrak Anchor Institutions



Laboratories, an independent, non-profit genetics research firm employing 1,400 and 200 Ph.D. scientists that is constructing a new 189,000 square foot laboratory and office facility on a 17-acre parcel at the UConn Health Center. Groundbreaking occurred in January, 2013 with full completion of the new facility in 2014.⁴⁵

⁴⁴ (<http://www.harthosp.org/AboutUs/HartfordHospitalToday/HartfordHospitalStatistics/default.aspx>, Accessed 10/2/2012); ("Free Hospital Look-Up: Saint Francis Hospital and Medical Center." www.ahadataviewer.com. Accessed 12/3/2012); (http://www.westernmassedc.com/boston_area_industrial_clusters/healthcare/, Accessed 10/2/2012); (<http://baystatehealth.org/Baystate/Main+Nav/About+Us>, Accessed 10/2/2012)

⁴⁵ The Jackson Laboratory. (2012). The Jackson Laboratory for Genomic Medicine: revealing the complex causes of disease and growing Connecticut's bioscience economy." (Website). <http://www.jax.org/news/archives/2012/ct-progress-report.html>. Accessed 10/2/2012.

As described earlier, Health and Social Services is a rapidly growing sector, particularly around hospitals. It is expected that this sector will expand in the future as the regional population ages and as the country's bioscience needs increase. The expansion of this sector in and around station areas could become a major driver of transit-oriented development.

While the largest education-related anchor institutions are outside of the transit corridors, there are also a significant number of smaller educational institutions located near the transit corridors. The two largest universities in the region - the University of Connecticut in Storrs, CT and University of Massachusetts in Amherst, MA - are located outside of the transit corridors (Figure 46). However, the NHHS and Vermonter rail service and *CTfastrak* will stop within walking distance of several colleges and universities, including:

- Trinity College (Hartford)
- Central Connecticut State University (New Britain)
- Smith College (Northampton)
- Springfield College (Springfield)

The NHHS rail and *CTfastrak* will also stop within a few miles of several colleges and universities, including:

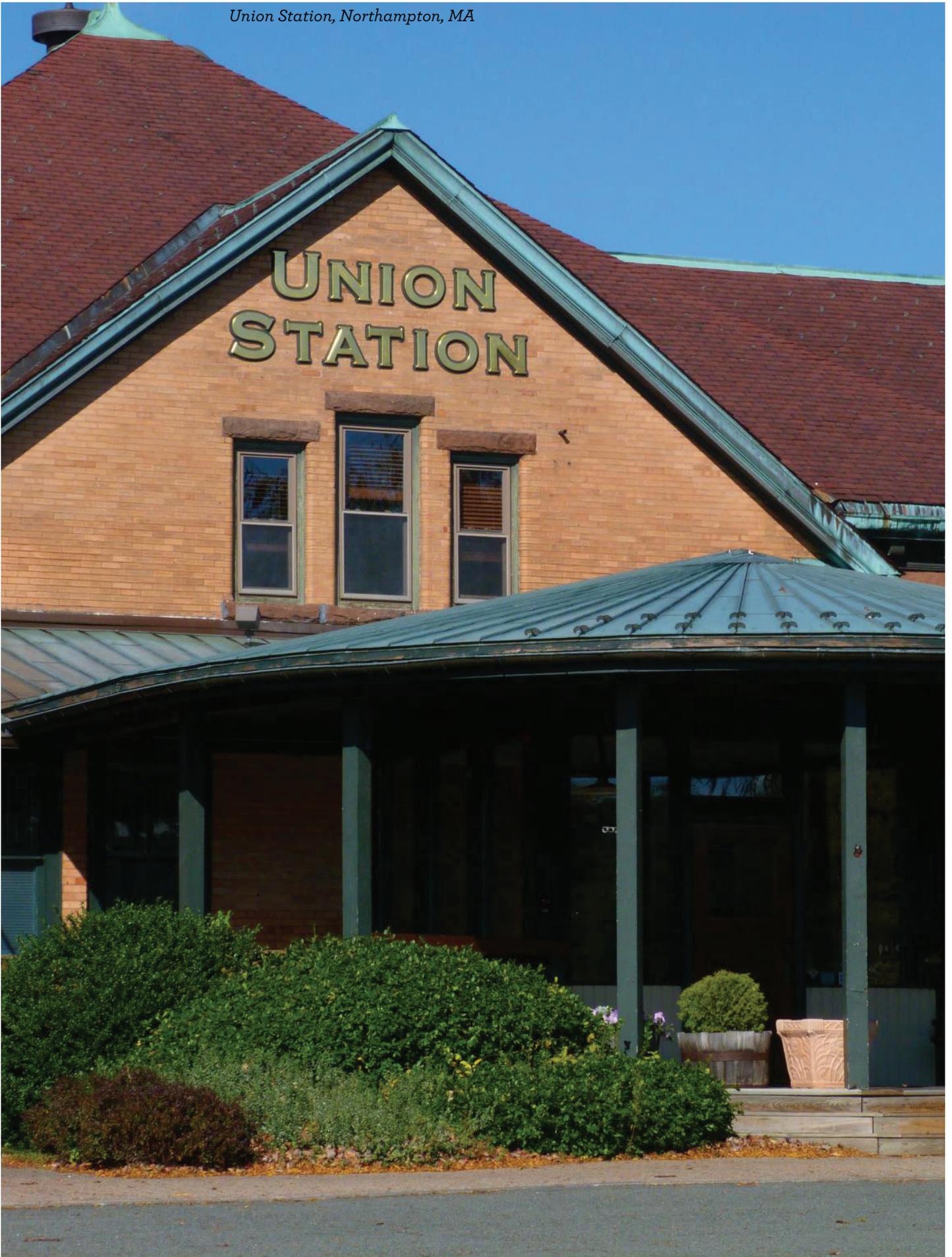
- The University of Hartford (West Hartford)
- St. Joseph's College (West Hartford / Hartford)
- The University of Connecticut School of Law (Hartford)
- Goodwin College (East Hartford)
- Asnuntuck Community College (Enfield)
- Western New England College (Springfield)
- Springfield Community Technical College (Springfield)

The colleges and universities within walking distance of the new transit stops stand out as the most easily connected to the new transit services, though greater connections could also be formed with colleges and universities located within a few miles of the station areas.

CONCLUSION

This concludes the market analysis section of the report, which has described the region's existing economic, demographic and real estate conditions. In the next section, a set of policy and strategy recommendations are presented, which will build upon the market analysis findings to lead to implementation of TOD in the station areas. These recommendations are rooted in the region's economic, demographic and real estate strengths.

Union Station, Northampton, MA



2. TOD Opportunities and Strategies for the Knowledge Corridor

Regional TOD Opportunities and Strategies

Station Area Implementation

Regional TOD Opportunities and Strategies Summary

REGIONAL OPPORTUNITIES AND STRATEGIES - GOVERNMENT

Direct state economic development resources to station area locations. Form linkages between the provision of state financial assistance to private companies, in the form of tax credits or low-interest loans, to expansion within or relocation to a station area.

Reinforce state government presence in new and existing buildings on the transit corridors. Form linkages between state government office leasing procedures and station area locations. Investigate partnerships with private developers to construct new office space within the station areas to be occupied by government offices.

Prioritize station areas for other forms of state financial assistance. While both states have already embedded transit adjacency into some of their grant and loan programs, the priority for TOD locations could be expanded or added. Below is a limited listing of the key program areas that would most benefit the station areas:

- Affordable housing financing
- Market-rate housing financing (single-family and multifamily)
- Brownfields funds
- Historic rehabilitation funds and tax credits
- Land acquisition and redevelopment financing
- Regional magnet school construction

Provide technical assistance to municipalities along the transit corridors to create TOD master plans for each station. Work with local municipalities to establish a TOD master plan for each station area to determine the appropriate zoning and investment needed. To facilitate this, local planning staff will need outside assistance, either in the form of state or MPO staff expertise or funding for planning firms to conduct station area master plans. Some of this work has already begun supported by a variety of funding sources, such as the HUD Sustainable Communities Regional Planning Grant and the State of Connecticut TOD Pilot Program.

Direct MPO discretionary funds to station areas. MPOs should support infrastructure investments at station areas with their discretionary funds.

REGIONAL OPPORTUNITIES AND STRATEGIES - ANCHOR INSTITUTIONS

Encourage and explore opportunities to relocate or expand components of the state university systems to station areas. Review state university system master plans and investigate opportunities to relocate university departments or campuses to station areas. Work with institutions currently located within station areas to design existing or future facilities to create a TOD-supportive environment, such as by implementing pedestrian-friendly design elements. Consider prioritizing station areas for future expansion of the state university systems, including:

- Central Connecticut State University
- University of Connecticut Health Center
- University of Connecticut
- University of Massachusetts

Engage regional anchor institutions in a dialogue about how their future expansion can be transit oriented. Reach out to regional anchor institutions to review their expansion plans and investigate opportunities for expansion within the station areas. Listed below are key institutions to engage due to their regional economic importance and proximity to station areas:

- Hartford Hospital
- St. Francis Hospital
- Mercy Hospital
- Baystate Health Systems
- Trinity College
- Smith College
- Major regional corporations, such as Aetna, MassMutual and The Hartford.

Consider anchor institutions in the final system design for local bus connections to the CTfastrak, NHHS Rail and Vermonter transit systems. There are also anchor institutions that are within a short, but not walkable distance of the transit corridors. These institutions should be connected through seamless local shuttle or bus connections with operational schedules timed to coincide with arrivals and departures on the main transit lines. They include:

- University of Hartford
- St. Joseph's College
- Asnuntuck Community College
- Goodwin College

Convene a partnership between the region's research hospitals and its universities. Establish a dialogue between the region's research institutions, particularly in the biosciences industry. Work with regional economic organizations, such as the Hartford Springfield Economic Partnership and the Metro Hartford Alliance to facilitate these connections.

Investigate opportunities for research or business incubator space within the station areas closest to the region's research institutions to reinforce the transit connections between institutions. Station areas should be considered as priority locations for state- or institution-supported research or business incubator space. An example of incubator space, the Massachusetts Green High Performing Computing Center, already exists in the Holyoke station area. This will lead to opportunities for station areas to develop as research hubs along the transit corridors and further connect the region's research industries.

Regional TOD Opportunities and Strategies

This section provides recommendations about opportunities, strategies and tools for implementing TOD along the planned transit corridors in the Knowledge Corridor region. The strategies have been organized by the scale of implementation, which range from policies at the regional level to the individual station areas.

REGIONAL AND CORRIDOR IMPLEMENTATION

At the regional level, state and regional governing entities can take steps to implement strategies that will improve the demand for TOD at the station areas. These steps are not specific to any station area, but rather represent an approach to directing more investment into station areas. Based on the market analysis findings, this investment is most likely to come from state government or from the region's anchor institutions. Below, we summarize the opportunities to enhance existing programs, create new programs, and forge connections that will support demand for TOD in the Knowledge Corridor.

STATE AND REGIONAL GOVERNMENT INVESTMENT

The state governments of Connecticut and Massachusetts, along with CRCOG, CCRPA and PVPC, play an important role in building regional demand for TOD by directing their resources to the station areas. These resources are diverse and span many agencies, departments and funding programs. They encompass everything from decisions of where to place state administrative facilities, such as offices and schools, to where to invest transportation, housing and economic development funds. By prioritizing the station areas when making decisions related to these resources, the effects of the investment in the transit by the states will be magnified. Since the near-term prospect for private residential and commercial development is limited in many station areas, states can take the lead and begin to change the character of the station areas—making future, complementary development more likely.

Coordinating the many different state and regional funding sources and decisions that could potentially be utilized to support TOD in the station areas may be challenging.

Step One: Catalog and inventory the various state and regional investment opportunities that exist in the region.

The first step to implementing this strategy is to catalog and inventory the various state and regional investment opportunities that exist in the region. The regional strategies matrix (Figure 47) shows some of the key “levers” that exist, describes existing initiatives within the region that are already targeting the station areas, and offers suggestions for further utilization of these levers as TOD generators. Included in Appendix E are detailed descriptions of the key levers. In developing a catalog of state and regional levers, it is important to think broadly about what resources could be targeted toward the station areas. State and regional levers can be much more than just financial assistance to housing developments. There are many

Figure 47: Regional Strategies Matrix

Strategy	Tools	Lead Actors	Description	Examples from other regions	Existing CT Program	Existing MA Program	Opportunities for Enhancement
Regional TOD Planning	Develop regional land use scenarios that establish a vision for TOD at the regional and corridor scales.	Regional Planning Organizations (RPOs)	Development of regional land use scenarios that designate corridors and station areas as key places to accommodate future housing and job growth in the CRCOG and PVPC region.	Arlington County, VA	CRCOG regional transportation and land use planning	PVPC regional transportation and land use planning	Allocate a greater percentage of future regional growth to the transit corridors, working closely with local jurisdictions.
	Technical assistance	RPOs Community Partners	Provide technical assistance to municipalities on TOD planning and implementation.	Delaware Valley Regional Planning Commission	State of Connecticut technical assistance to City of Meriden; technical assistance workshops; CRCOG Model Sustainable Land Use Code initiative.		Create a framework for providing state or regional technical assistance to individual municipalities to assist with station area planning. Establish a state TOD Coordinator to coordinate delivery of technical assistance.
	Zoning Incentives for affordable housing near transit	State governments; Municipalities	Encourage affordable housing in TOD and infill locations with inclusionary zoning policies or affordable housing statutes.	State of California Affordable Housing Density Bonus Program	Incentive Housing Zones; C.G.S. 8-30g	M.G.L. Chapter 40R; M.G.L. Chapter 43D Expedited Permitting	C.G.S. 8-30g permits developers to override local municipal zoning restrictions in municipalities with less than 10% of their total housing stock being affordable housing and are controversial. Consider revisions to the statute that would target station area
TOD Project Financing	Direct funding and financing for real estate development in transit areas	State governments	Provide direct financing to TOD projects, infrastructure, environmental clean-up, and other site costs.	Portland TOD Program	DECD CHAMP; Capital Region Development Authority		Existing funding programs for affordable and mixed income housing prioritize TOD locations. Other regions have successfully created funding sources set aside solely for supporting TOD, such as Portland, OR.
	Provide funding and financing for affordable housing in Station Areas to ensure equitable development patterns and maximize benefits of transit to lower income communities.	State housing agencies; community development financial institutions; philanthropy	Allocate or prioritize funding sources for affordable housing TOD, including gap financing for projects. Both SHFAs already award projects in locations near transit, but these criteria could be tightened and/or a "Basis Boost" added to help infill projects pencil out given higher acquisition costs.	City of Denver TOD Fund	DECD CHAMP; CHFA programs	Housing Development Incentive Program; M.G.L. Chapter 40R	Provide greater weight in Qualified Allocation Plan / Selection Criteria to proposals in a TOD area. Provide 30% basis boost in LIHTC financing for projects in a TOD area. Prioritize CDBG and HOME investments to TOD areas.
	Tax-Increment Financing	State governments	Review existing tax-increment financing statutes and study mechanisms to improve utilization. Make tax-increment financing available to all municipalities with station areas.	Dallas Region Transit-Oriented Development Tax-Increment Financing District	Stamford South End redevelopment district	Commercial Area Transit Node Housing Program; DHCD programs	While both states enable tax-increment financing, it is rarely used. Additionally use of tax-increment financing is not currently enabled in many station areas, due to lack of redevelopment designation. Study existing state statutes compared to other states and identify mechanisms to increase utilization.
	Arts and innovation center funding	State governments; Municipalities; Public and Private Foundations	Allocate or prioritize funding sources for arts and innovation centers as part of TOD at station areas. These types of investments can act as a catalyst for future company formation or expansion at the station areas.		Billings Forge development in Hartford; Connecticut Innovation Centers	Massachusetts High Performing Computing Center in Holyoke, MA	Prioritize TOD location in allocating criteria for arts and innovation funds.

Strategy	Tools	Lead Actors	Description	Examples from other regions	Existing CT Program	Existing MA Program	Opportunities for Enhancement
Economic Development and Job Creation	Prioritize station areas for allocation of business incentive programs	State governments	Award assistance to firms that locate or expand in new station areas	Illinois Business Location Efficiency Incentive Act	CT Innovations Economic Development Assistance Economic and Manufacturing Assistance	Economic Development Incentive Programs	Existing state business incentives do not prioritize TOD locations. Enact a priority for funding to companies that expand in or relocate to station areas.
	Set up regional bioscience business incubators connected to the region's university and hospital research institutions	State governments; Anchor Institutions	Establish better connections between the region's research universities and research hospitals, including creation of bioscience business incubators to improve the flow of research to company formation.	University City Science Center, Philadelphia, PA			Establish bioscience business incubators located within station areas adjacent to key research institutions.
	Reinforce state government presence on transit lines	State governments	Prioritize transit locations for leasing or buying state agency office space in order to create a stronger presence and support revitalization and new development in station areas.		State of Connecticut is consolidating state agency offices in vacant buildings in Downtown Hartford		Review opportunities to relocate or expand state offices within station areas. Incorporate TOD locations as a formal criteria for state office leasing / construction decisions.
	Encourage state universities to locate or expand in station areas.	RPOs, State University Systems	Conduct outreach to state universities; encourage relocation or expansion to TOD locations; engage actively with campus planning processes at TOD locations.	Cleveland Health Line	UConn Hartford is relocating to downtown Hartford	UMass has established a Pioneer Valley Life Sciences Institute in Springfield	RPOs can coordinate with state government to prioritize TOD locations for expansion / relocation of elements of the state university systems.
	Encourage private universities and colleges to expand in station areas.	RPOs; Municipalities	Conduct outreach to private universities and colleges; encourage relocation or expansion in TOD locations; engage directly with campus planning processes at TOD locations.				RPOs can lead an outreach process to the region's private colleges and universities to understand their future expansion plans and encourage them to expand in station areas.
	Encourage hospitals to expand in station areas	RPOs; Municipalities					RPOs can lead an outreach process to the region's hospitals to encourage them to incorporate TOD locations into their future expansion plans.
Transportation and Infrastructure Improvements	Target infrastructure upgrades to TOD areas to make the station areas more competitive for new development	RPOs; Utility Companies	Establish competitive funding to finance placemaking improvements like bike infrastructure, streetscapes, and public space improvement. Include such improvements in regular MPO transportation improvement programs using STP and CMAQ funding. Work with utilities companies to plan for needed upgrades in station area locations.	Atlanta Regional Commission Livable Centers Initiative; San Francisco Bay Area Sustainable Communities Strategy	CT is apportioned approximately \$128 million in STP funding annually and \$44 million in CMAQ funding.	MassWorks TOD and Infrastructure and Housing Support Program. Massachusetts is apportioned approximately \$150 million annually in STP funding and \$63 million in CMAQ.	Commit STP and CMAQ allocations to infrastructure improvements at the regional level, prioritizing station areas. Note that there are some limitations on CMAQ funding such as number of years for which it is eligible for some purposes.
	Incorporate regional anchor institutions into final service plans for local bus shuttles and connector routes.	RPOs; ConnDOT; MassDOT	Review opportunities to connect other regional anchor institutions, such as UConn or University of Hartford, with the CTfastrak or NHHS rail corridors via coordinated shuttle bus or BRT service.		CTfastrak service plan already includes connecting services to CCSU and the UConn Health Center.	PVTA already runs frequent bus connections between Amherst and Northampton, MA	Review feasibility of rapid connections to other regional anchor institutions, such as UConn, the Five Colleges, etc.

forms of financial assistance, state policies and regulations, and real estate facility decisions that could potentially be harnessed to support TOD. For example, the states have spent millions of dollars building new community colleges or renovating existing ones in recent years. The State of Connecticut took an important step towards supporting TOD by relocating one of them, Gateway Community College, to a transit-oriented location in downtown New Haven. Doing so brings thousands of new pedestrians and potential transit users, which in turn builds demand for TOD in that location.

Step Two: Develop a coordinated strategy to target multiple levers on the station areas and create a State TOD Coordinator.

The second step is to develop a coordinated strategy to targeting multiple levers on the station areas, combining them in tandem to create a bigger impact. In the matrix, some levers are state policies and some are financing programs. For the most part, most of the levers are existing programs that state and regional governing bodies are already implementing. However, all levers share one common feature: They are controlled by a branch of state or regional government. The challenge is to coordinate multiple levels of government to comprehensively direct these resources to the station areas. To facilitate that goal, one of the key recommendations is creation of a TOD Coordinator within state government, which would be focused on working with different government agencies and departments to assemble these levers. However, CRCOG, CCRPA and PVPC are also well-positioned to take action by advocating for focusing state government levers on the station areas.

ANCHOR INSTITUTION
INVESTMENT

Anchor institutions represent one of the primary competitive advantages for the Knowledge Corridor, a region rich with anchor institutions, including large regional hospitals, nationally-acclaimed colleges and universities, and other large sources of employment that provide stability and define the region. While most of these regional anchor institutions are not directly adjacent to the station areas, they represent a real opportunity as some of the most likely sources of job growth and commercial expansion in station areas.

Similar to many parts of the country, the opportunities for institution-led development in the Knowledge Corridor are primarily driven by the “Eds and Meds,” such as universities and colleges, hospitals, and research institutions. This is due to the central role educational and medical services play in our modern society. National factors such as the ever greater importance of higher education in securing stable employment and the aging and longevity of the population are contributing to significant job growth in these industries, which takes the form of campus expansion and partnerships by educational and medical institutions. As Dr. Eugenie L. Birch, co-director of the Penn Institute for Urban Research and one of the panelists at a Reinventing Older Communities session on anchor institutions put it: “Universities are the factories of the 21st Century.”⁴⁶ Much like factories once provided the base of a local economy, export income and a multitude of job opportunities, hospitals and universities today are critical to urban economies, providing employment and purchasing capital while drawing income from outside areas into the local economy.

46 Chakrabarti, Prabal. (2012). Anchors Aweigh: Why Do Anchor Institutions Matter? Cascade, No. 81, Fall 2012.

In the Knowledge Corridor, there are multiple opportunities for regional anchor institutions to support TOD in the station areas. This is, in part, because anchor institutions have more to offer cities than just occupying space. According to Carolyn Adams of Temple University: “Universities and medical facilities provide an institutional infrastructure that promotes innovation by training symbolic analysts and producing new knowledge. Their function of educating students increases the quality of human capital in the region, thereby increasing productivity and attracting firms, while their research activities help firms gain competitive advantages.”⁴⁷ Around the country, anchor institutions have benefitted their local economies in the following ways⁴⁸:

- **Direct development of real estate**, e.g. construction of new classroom space or outpatient facility. Direct expansion creates construction jobs as well as permanent educational, medical, and property maintenance jobs.
- **Indirect development of real estate**, e.g. partnerships with local developers to build student housing. Many anchor institutions are looking to the private market for their student housing needs, which can add to the local tax base and create a local student population to support retail development.
- **Support and creation of new businesses.** Anchor intuitions, particularly those with robust research facilities, often lead to spin-off company formation when professors and/or graduates find a market application to their research. Many high-growth regions, such as Silicon Valley, the Boston Metropolitan Area, and the Research Triangle region of North Carolina, had their genesis in the powerful universities and research hospitals located there, which led the research and innovation that later resulted in high levels of new company formation and job creation that has occurred in those areas.
- **Support the local economy through workforce development.** Universities, in particular, play the critical role in today’s economy of educating the workforce. Among their greatest output are highly-educated and trained graduates sought after by employers, which attracts firms to the region. The key, however, to this benefit is making the local area an attractive place for graduates to remain after graduation by providing jobs, affordable places to live, and an urban environment attractive to a young, single population.

47 Adams, Carolyn. The Meds and Eds in Urban Economic Development. *Journal of Urban Affairs*, Volume 25, Number 5, pages 571-588.

48 Webber, Henry S., Karlstrom, Mikael, and Richman, Harold. (2009). *Why Community Investment is Good for Nonprofit Anchor Institutions: Understanding Costs, Benefits, and the Range of Strategic Options.* (Report.) Chicago, IL: Chapin Hall at the University of Chicago.

- **Support the local economy through purchasing power.** Anchor institutions purchase enormous amounts of goods and services as do their clientele (ie. students, employees, etc.). This purchasing power can support many local businesses and jobs. Many examples exist of universities, including Yale University, that have pledged to purchase a specified percentage of their goods and services from local purveyors.
- **Revitalize neighborhoods.** Anchor institutions can impact their surrounding neighborhoods by partnering with the local municipality to improve local schools, setting up security watches, offering incentives to their faculty to live in the surrounding neighborhood, and underwriting community assets like grocery stores. An example of this strategy is the West Philadelphia Initiatives sponsored by the University of Pennsylvania, which include a university-supported public charter school serving the surrounding neighborhood, targeted employee housing incentives, security guards and cleaning services deployed throughout the neighborhood, and technical assistance for local small businesses provided by the Wharton School of Business.

Direct engagement and cooperation with the institutions is necessary to determine how government bodies and institutions can work together to implement some or all of the above strategies. The Consulting Team recommends that government bodies meet with the local anchor institutions to better understand their long-term plans. As these anchor institutions become better connected to transit, they will become potential sources of jobs for populations that are currently unable to access them, especially within the Hartford region. This will allow the transit and station areas to be leveraged as a part of workforce development strategies, and will also build demand for new housing development at other station areas in the transit network. While some opportunities may present themselves more immediately, these should be largely considered long-term strategies.

These two key strategies - leveraging government investment and engaging anchor institutions - are regional strategies utilized primarily to increase demand for TOD at the station areas. They require action by state or regional government bodies to adopt policies to direct state investment to the station areas and to engage the region's anchor institutions. Whether through state financial subsidies or construction of a new university facility, these investments will result in the creation of markets at the station areas that do not currently exist. This, in turn, will encourage secondary private-market investment in the station areas.

The next section describes the strategies and recommendations applicable to the station areas themselves. As opposed to the regional strategies described above to increase demand for TOD, the station area strategies are primarily utilized to streamline the creation of a new supply of TOD at the station areas.

Station Area TOD Opportunities and Strategies

TOD implementation at the station area scale can consist of a wide variety of activities, including enacting TOD-supportive land use policies, making strategic infrastructure investments, or subsidizing new development projects. Often, a combination of these strategies and tools are needed to facilitate TOD in any given station area. While each station area in the Knowledge Corridor region is unique, many of them can be grouped based on their similarities as they relate to implementation. The Consulting Team employed a typology framework, organizing station areas into “place types” based on their existing development and market conditions, which influence the potential for TOD. This framework then allows for the development of strategies and tools that are appropriate for each “place type”.

TYPOLOGY FRAMEWORK

The typology framework examines the current physical, economic, and demographic characteristics of each station area (defined as a half-mile radius of the planned rail or BRT station), and then groups them into categories based on their similarities. For each station area in the region, the Consulting Team evaluated **Market Characteristics** and **Land Use Context**, which together describe the “readiness” of each station area for TOD. The metrics underlying the market and land use factors are explained in more detail below.

MARKET CHARACTERISTICS

The strength of the real estate market in a particular station area is a critical element to consider when designing a TOD implementation strategy. Station areas with weaker market conditions may require intervention from the public sector to attract private investment, while those exhibiting strong market dynamics may need to significantly modify land use policies in order to enable TOD to occur. Moderate market areas may only require strategic infrastructure investments and regulatory incentives in order to unlock the potential for TOD.

To quantify the market characteristics of each station area, the Consulting Team utilized the residential market data including comparable residential sales and rentals within one mile of the station. The sales price and rent averages at each station area were indexed on a relative scale ranging from 0 to 100, with the score of 100 given to the station area with the highest sale or rent value within the corridor. Thus the typology ranks each station area in comparison with the other station areas within the Knowledge Corridor region. This approach is not predictive of the financial feasibility of new development in any given category, but rather it provides a relative sense of how any individual area performs relative to the region. Based on this analysis, stations were sorted into three categories of market strength:

- **Stronger:** These station areas have stronger market conditions where there is potential for new development to occur without significant investments from the public sector.
- **Emerging:** These station areas have moderate market conditions where new development is not currently feasible, but may become viable in the short to medium term with careful planning and strategic public investments.
- **Limited:** These station areas currently have weak market conditions and rents and/or sales prices do not support new TOD in the short to medium term. In these locations, careful phasing of improvements can help to build value over time, making private development possible in the long term.

LAND USE CONTEXT

In addition to market characteristics, the land use context at each station area is a fundamental factor to consider in TOD implementation. Typically, station areas with more people, a mix of uses, and pedestrian-friendly streets have higher levels of transit ridership, rely less on auto travel, and are more attractive to development. As density and the mix of uses decline, reliance on auto travel increases, and higher density TOD becomes more challenging to implement. The Consulting Team examined three components of land use context: density, land use mix, and walkability.

- **Density:** Higher density supports TOD by providing more opportunities for retail, employment and other amenities within a walkable district that will attract new residents and employers to the station area. Conversely, station areas with low employment and residential densities offer fewer amenities to future TOD residents and employees. To measure density, the Consulting Team calculated the sum of population and employment per acre in the half-mile radius around each station and scored each station area on a scale from 0 to 100.
- **Land Use Mix:** Mixed-use places offer the opportunity for residents and workers to bike or walk instead of drive to buy groceries, eat out, or meet with friends because the goods or services they seek are in close proximity. Typically, mixed use districts can achieve higher levels of transit ridership and pedestrian/bike activity, in part because locations with higher density support more local retail and service destinations, though the types of retail and services tend to be different depending on the land use mix. Single-use places, on the other hand, can inhibit walking and biking because of the lack of diversity of activities. For example, a business district that lacks retail and residential uses is often vacated on evenings and weekends, which makes it less appealing for future TOD projects. To calculate land use mix, the Consulting Team calculated the average mixture of uses across both corridors by determining the percentage of the half-mile radius land

area around each station devoted to residential, commercial or industrial uses and created a 0 to 100 scale of the deviation of each station area from the average mixture of uses across the corridor. The Consulting Team utilized this methodology after noting that the corridor average mixture of uses is balanced (54 percent residential/31 percent commercial/15 percent industrial) and deducing that any station area that is widely divergent from the average has an excessive concentration of one use.

The Knowledge Corridor is home to a wide range of land use contexts:

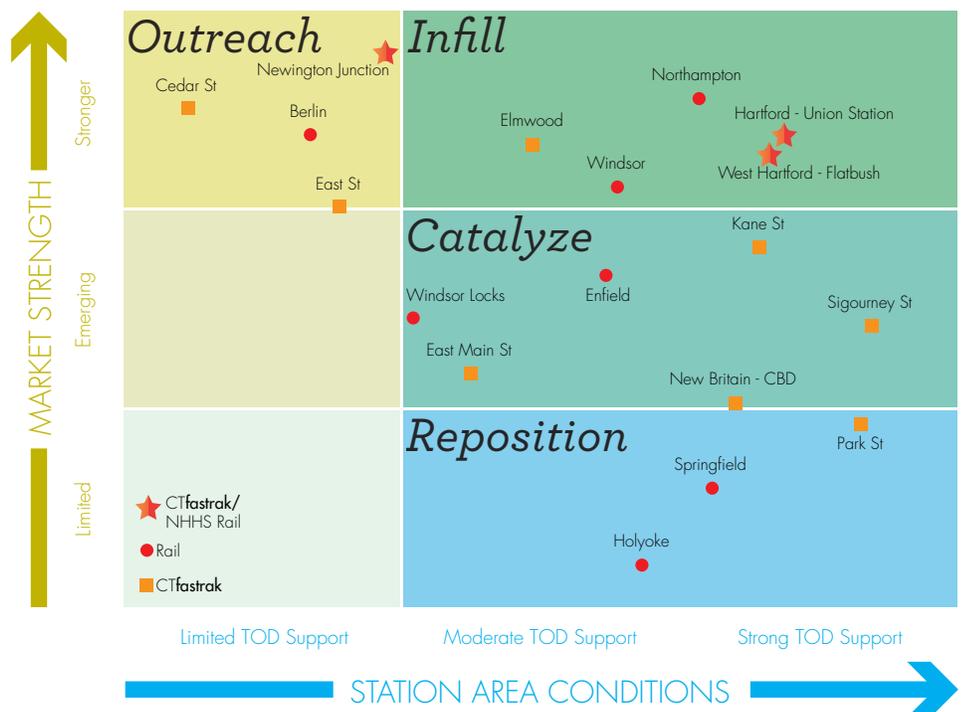
- **Walkability:** The existence of a pedestrian-friendly street pattern can be an important factor in attracting residents and employees that are interested in a walkable, urban lifestyle with less dependence on auto travel. The Consulting Team calculated the Walk Score of each station area using “Street Smart” Walk Score. Each station was ranked on a scale from 0 to 100 based on the Walk Score.



The existing land use contexts in the Knowledge Corridor’s station areas varies considerably ranging from high-density, compact built forms in downtown Hartford and Springfield to large masses of former industrial buildings in Holyoke to low-density, single-family houses on half-acre lots in Berlin and Newington.

The juxtaposition of the Market Characteristics and Land Use Context provides the framework to evaluate the existing conditions for TOD for all the station areas in the Knowledge Corridor region. Figure 48 illustrates how each station area scores in terms of the two axes, with Market Characteristics shown on the Y axis and Land Use Context on the X axis.

Figure 48: Station Area Typologies



Generally speaking, there are few stations in the region that have strong market and land use characteristics to support TOD, indicating that the opportunities for private development will be confined to a smaller geography in the short term. Most of the region's station areas will require significant investments from a combination of private sector, public sector, and institutional partners to realize TOD in the medium to long term.

KNOWLEDGE CORRIDOR STATION AREA TYPOLOGIES

By identifying station areas that naturally cluster together on these two axes, the Consulting Team generated implementation place types, grouping the station areas with similar needs and opportunities. These place types are: Infill, Outreach, Catalyze, and Reposition.



- Infill:** These station areas have the strongest likelihood of near-term TOD, due to their stronger market conditions and supportive urban form. These station areas are generally built-up and are not likely to offer large tracts of land for redevelopment; rather, new TOD will largely consist of infill development building on the historical development patterns and filling out underutilized sites. The infill stations include Northampton, and station areas in and around Hartford, underscoring the fact that the near term TOD opportunities will likely be in places that have an existing base of residents and employees on which to build. Since private developers are more likely to lead TOD at these station areas, the policy focus is on appropriate zoning policies and enhancing infrastructure within the station area to better support new TOD.



- Outreach:** These station areas also have a relatively strong market demand for new development, but the station area urban form is less supportive of TOD. In these station areas, the prevailing existing development is suburban and automobile-oriented, which will inhibit pedestrian and bicycle connections to the stations from surrounding TODs. In many cases zoning regulations do not permit mixed-use or higher-density TOD, which may dissuade developers from pursuing TOD in these station areas, despite the stronger market conditions. TOD in outreach stations is likely to be lower in intensity, including products like attached townhouses, small-lot single-family houses, and potentially small scale apartment projects if regulations allow. The implementation approach for these station areas is to conduct planning and visioning activities to gain public support for TOD, and modify land use regulations to allow for a broader range of development consistent with TOD.



- Catalyze:** These station areas occupy a middle ground, where market conditions are not strong enough to support TOD in the near term, but the urban environment is conducive to TOD. In these types of places, the implementation of TOD-supportive zoning regulations alone is not likely to be enough

to spur private-sector development due to soft demand. The participation of public and/or anchor institutions can help to unlock the private market in these locations. Some examples of implementation strategies include working with hospitals, universities, or government agencies to either expand or create a new presence in the area, thereby generating more activity, or providing economic incentives to encourage larger businesses to locate in the station area.



- **Reposition:** These station areas have a common legacy of historical buildings in an urban context, ranging from industrial mills in Holyoke and Park Street to downtown centers in Springfield and New Britain, which have experienced decades of slow decline. While the existing development patterns are somewhat supportive of TOD, these locations will generally require significant repositioning to attract new development and regain vibrancy. A combination of policies and strategies will be needed to promote TOD, including introducing new “demand drivers”, offering significant incentives to developers, and making strategic infrastructure and “place-making” investments to attract private capital.

The following pages contain case study examples of development within each of the station area typologies. In each of these locations, the market characteristics and land use contexts were similar to station areas in the Knowledge Corridor before government action was taken to develop TOD. The case studies demonstrate the positive outcomes that can result from government action to support TOD, and offer valuable lessons for successful development within each Knowledge Corridor typology.

Additionally, detailed descriptions of the existing conditions of each station area and the unique attributes that are supportive of TOD (e.g. existing station area TOD master plan) are described in Appendix A.

CASE STUDY - Infill

360 State Street

NEW HAVEN, CONNECTICUT



360 State Street is an example of how an active municipality partnered with a creative developer can pioneer high density, mixed-use, infill development alongside rail improvements. This redevelopment of a 1.6 acre brownfields site that had been a parking lot was the result of a competitive RFP issued by the City of New Haven in 2006, which requested proposals for a development that would serve as a gateway for the downtown and complement the new State Street Metro-North/Shore Line East Station train station that opened across the street in 2002.

Using a series of planning and design charrettes, the developer, Becker + Becker, was able to establish an appropriate program, scale, unit mix, architectural character, and sustainable elements with community support. This process led to, among other things, the seeking out of a grocery store as an anchor tenant in an underserved community. When this search yielded no viable options, the developer launched its own food co-op model, which has been tremendously successful.

360 State Street features 500 high-end residential apartments comprising 50 affordable and 450 market rate units; 20,000 square feet of amenities including a fitness center, library, screening room, yoga studio, game room, party room, catering kitchen, business center, and art gallery; a half-acre green roof and swimming pool; a bike shop and bike storage room; a 500-car public parking garage with electric car charging stations and a Zipcar sharing program; and the aforementioned 25,000 SF community-owned food co-operative, Elm City Market.

360 State Street was a success in part due to public support that enabled the developer to leverage an enormous amount of private investment capital. The City of New Haven contributed the land and a streetscape improvement grant, while various state agencies contributed HOME, Housing Trust Fund, Urban Act Grant, and energy efficiency funding. 360 State Street also demonstrates the impact that new mass transit service, located directly across the street, and a local anchor institution can have. The site upon which 360 State Street was constructed had sat vacant for more than four decades, but in 2006 when the City of New Haven issued its RFP, the improved access to mass transit and the expansion of Yale University together provided the conditions necessary for redevelopment of the site.

CASE STUDY - Outreach

Clarendon Station

ARLINGTON COUNTY, VIRGINIA



The evolution of the Clarendon Station area demonstrates the value of community outreach, long-term planning, and benefits of understanding the unique context different suburban station areas. Clarendon is one of five Washington Metropolitan Area Transit Authority (WMATA) Orange Line stations along Wilson and Clarendon Boulevards in Arlington County, Virginia. At the time of the station's opening in 1979, the surrounding commercial corridor was in decline despite being surrounded by stable residential neighborhoods.

Arlington County undertook a planning process in the 1960s to 1980s to understand how new transit investments could leverage growth while supporting the existing high quality of life. A large-scale community engagement process was undertaken to learn the community's vision for the new stations while also publicizing the potential benefits of the new transit. This process resulted in the creation of a General Land Use Plan (GLUP) for the entire corridor, based on priorities of mixed-use, high-density redevelopment near stations, quality pedestrian environments, and preservation of existing residential neighborhoods. The GLUP clarified which station areas were best suited for higher intensity development, and for residential or commercial emphases.

"Sector plans" were created for the quarter mile area surrounding each station. These plans described the stations' envisioned character, intensity, public infrastructure needs, use mix, and urban design standards. The plans were primarily implemented through the use of incentive zoning; the GLUP retained relatively low-density zoning, but site plan review was used to examine each proposed development project for compatibility with the sector plan. Projects in compliance with the sector plan – including delivery of public improvements – were then approved for higher densities. The public sector also encouraged TOD through strategic infrastructure investments and WMATA public-private development partnerships.

Clarendon was classified as an "urban village" since it was located between stations better suited for higher-intensity office and retail uses. The sector plan created a very small, highly-targeted area near the station for investments and higher-density employment. This vision – which has been revisited and updated as necessary – has largely been fulfilled. Today, the immediate blocks surrounding the Clarendon station feature a walkable area of offices, high-density residences, and retail offerings. Between 1984 and the first quarter of 2011, 1.1 million square feet of office, over half a million square feet of retail, and over 2,300 housing units were constructed in the Clarendon sector plan area.

CASE STUDY - Catalyze

Metro Green

STAMFORD, CONNECTICUT



Stamford has been one of the primary economic centers of Connecticut for decades, yet even with its close proximity to New York City, excellent transportation connections, and high-density commercial development, the area to the south of the train station had suffered from disinvestment for years. Metro Green, a premier mixed-income, LEED certified, transit-oriented community, has been a catalyst for the burgeoning residential and commercial development in the South End neighborhood, providing much needed affordable housing to the City of Stamford and serving as a model for smart growth development in the state.

Metro Green, developed by Jonathan Rose Companies and Malkin Properties, is located one block from the Metro North Stamford Railroad Station. The multi-phased community will include upon completion 255 mixed-income residences and a 350,000 square foot commercial tower on a mixed-use, transit-oriented site. Currently, the site contains 90 units affordable to households with incomes ranging from 25% to 60% of Area Median Income and 10 market-rate units. At the time of the completion of the first phase, the market was only able to support affordable housing, but the quality of the units, which led to a fully occupied first phase, demonstrated feasibility for the addition of market rate units. Two and a half years later, by the time the second phase of Metro Green had been completed, the private real estate market had generated 1,000 of new market-rate apartments in the South End neighborhood. In the third phase, expected to be completed in 2015, over 50% of the apartments will be unrestricted market-rate units.

By encouraging new residents to move in and changing the dynamic of what can be supported in the neighborhood, affordable housing at Metro Green has helped to redefine the Stamford station area. To now walk the neighborhood, it is impossible not to be struck by the transformation: new retail, art galleries, and other developments have sprouted throughout the formerly-industrial neighborhood. The Metro Green example demonstrates that affordable housing can provide a foothold for new investment in an historically dis-invested area, establishing demand for new housing and changing the appearance of the neighborhood. Later phases and/or other developments build on the success of the affordable housing and attract private investment capital, which slowly establishes a stronger real estate market in the location.



CASE STUDY - Reposition

Hope VI

ELIZABETH, NEW JERSEY

The Housing Authority of the City of Elizabeth (HACE), New Jersey partnered with Jonathan Rose Companies to serve as the program manager to create and implement a multiphased, multi-year HOPE VI Revitalization Plan in Elizabethport, an historic urban neighborhood. Elizabeth, NJ is an industrial city just outside New York City and the Elizabethport neighborhood suffered from a large supply of aging public housing and weak real estate conditions. Using a HUD mixed-finance strategy, the Elizabethport redevelopment plan included a mix of housing types affordable to a broad range of household incomes. The redevelopment of the neighborhood created 550 for-sale and rental units based on a thoughtful, organic in-fill planning strategy intended to mend the fabric of the neighborhood. Revitalization of the obsolete port neighborhood was realized through the full participation of public housing residents and the surrounding community in important decisions that defined the future of their community as a safe, well designed, mixed-income neighborhood.

Jonathan Rose Companies assisted HACE with the negotiation of complex development agreements in compliance with HUD regulations, and developed the financial strategy that was implemented for brownfield redevelopment, infrastructure improvements, acquisition, development and asset management of the various components within the HOPE VI Revitalization Plan.

Using a traditional neighborhood design strategy, the project created a series of pedestrian-friendly streets and civic spaces to encourage people to walk. Redevelopment of scattered brownfield and blighted sites, as well as an environmentally challenged waterfront, reconnected the community to their history and a new marina. Revitalization of the neighborhood-commercial corridors also helped to re-establish neighborhood services and a sense of community with the goal of reducing vehicle miles traveled for daily goods and services.

While the HOPE VI program has since been discontinued, HUD continues to make financing available through its Choice Neighborhoods program for large-scale redevelopment of public housing developments in urban areas. These funding programs enable a transformative change in the neighborhood by replacing aging, obsolete public housing units with new housing inspired by traditional neighborhood forms and available to a mixture of incomes, which promotes diversity. The Choice Neighborhoods program also requires applicants to identify partnerships with local educational institutions and employers, often including anchor institutions, to ensure the redevelopment not only improves the housing stock but also expands opportunities for residents to access quality education and employment.

STATION AREA TOD IMPLEMENTATION

The Consulting Team developed recommendations for policies and strategies that can be implemented within the station areas, organized by typology, to encourage TOD. These implementation strategies can be placed into six major categories:

- **Planning and Visioning**
- **Zoning and Land Use Regulation**
- **New Development**
- **Neighborhood Revitalization**
- **Local Transportation and Infrastructure**
- **Economic Development**

The accompanying matrix shown in Figure 49 summarizes the major strategies and tools, and identifies the lead implementers, existing programs and potential funding sources. Figure 50 shows the applicability of each tool and strategy to the Place Types and individual station areas. A full description of the strategies and tools can be found below.

Planning and Visioning

Station area planning, visioning, and technical assistance are important first steps in order to establish common objectives, goals, and priorities for TOD in each community. These activities can also help educate the community on the potential benefits of TOD, thereby building political support from residents, businesses, elected leaders, and other stakeholders. Station area plans that provide a clear policy direction can also help to attract investment by reducing uncertainty and risk to developers. Ongoing technical assistance to local jurisdictions will also be important in order to build the capacity of towns and cities to implement TOD.

Zoning and Land Use Regulation

There is no “one size fits all” standard for density, land use mix, or project design for new transit-oriented development. Successful, new TOD can include compact single-family homes, rowhouses, multi-story apartment buildings or towers. However, TOD-supportive zoning and land use regulations should be in place in all station areas to ensure that the mix of uses and densities are appropriate from the perspective of the community, and respond market realities.

Some potential TOD-supportive zoning tools to explore in the Knowledge Corridor include the following:

- Modifying zoning to permit multi-family and/or rental housing in areas that currently prohibit that use;
- Increasing height limits or FARs at key locations where higher density development can be feasible;
- Reducing parking requirements in high-density downtowns and mixed-use districts;

- Allowing mixed-use development, either in buildings with ground-floor retail uses or in a mix of single-use buildings clustered closely together, depending on market factors; and
- Transferring development rights from suburban and ex-urban locations to the station areas.

In addition to zoning tools, streamlining entitlements and project review processes can also help to accelerate the market for TOD, particularly in locations that have emerging or stronger real estate markets. Reducing the amount of time it takes to get a project approved result in cost savings to developers, and makes the community more attractive for new development.

Finally, cities and towns may wish to implement parking management at station areas to foster an environment that is more conducive to walking, biking, and transit ridership. Parking management may include a combination of strategies including reduced parking requirements, imposing parking fees and meters, starting car-sharing and bike-sharing programs, and creating shared parking districts. Revenues from parking fees and meters are often used to fund alternative transportation facilities and programs like providing transit passes to employees and students or building secure bike parking facilities.

New Development

Many of the station areas in the Knowledge Corridor are not perceived as strong locations for new development. There is a need for the region to attract new development types in transit areas that can signal to the market that TOD can be successful. Developers tend to be risk-averse and will continue to build projects they know can be successful. However, providing encouragement and incentives to develop these relatively untested projects and building types can help encourage the market in the right direction. These strategies can take many forms, ranging from assisting with parcel assembly, providing direct subsidies to new projects. These activities are typically led by cities or redevelopment agencies, but state agencies could also play an important role in providing financial assistance to private development. One example of this strategy is the allocation of \$60 million dollars by the Capital Region Development Authority to support new rental housing projects in downtown Hartford.

Many of the station areas are rich in historic buildings, giving them a unique identity and character. But much of the region's historic building stock is vacant or in need of significant reinvestment. The redevelopment or reuse of historic buildings can revitalize neighborhoods, generate additional property revenues to the city, and increase the appeal of these areas for TOD. The City of Hartford is currently pursuing this strategy in its support of the proposed restoration and adaptive re-use of the Bank of America tower, an iconic modernist structure in downtown, into 286 units of housing and utilizing, in part, federal and state historic tax credits.

Figure 49: Station Area Strategies Matrix

Strategy	Tools	Description	Lead Actors	Connecticut	Massachusetts
Planning and visioning	Station area plans	Complete station area plans that set clear development standards, align with the community vision, guide the type and location of new development, identify and prioritize future investments, and provide guidance to cities and towns on implementation.	Cities/towns; community members; landowners; stakeholders	TOD Pilot Program; RPO plans; local funds	RPO plans; local funds
	Community education and outreach	Build community support for walkable, transit-oriented districts through outreach and education activities that demonstrate the potential economic, environmental, and health benefits of TOD.	Cities/towns; Sustainable Knowledge Corridor Consortium partners; developers; community-based organizations; public health agencies; universities and colleges; Living Cities; Community Foundations	TOD Pilot Program; local funds; developers; foundations	Regional planning grants; local funds; developers; foundations
	Technical assistance	Build capacity at the regional and local level through workshops, training sessions, webinars, etc. to plan for and implement TOD.	CRCOG; PVPC; CCRPA; ConnDOT; MassDOT; CT DECD; MA DHCD; other community partners	HUD Office of Sustainable Communities; Inter-Agency Taskforce	HUD Office of Sustainable Communities; DHCD Training; MassDevelopment
Zoning and land use regulations	TOD-supportive zoning	Modify existing zoning regulations as appropriate to support TOD. Strategies will vary by station area, but may include: permitting multi-family housing in station areas; increasing height limits or FARs; reducing parking requirements; allowing mixed-use development; transfer of development rights.	Cities/towns	Incentive Housing Zones; C.G.S. 8-30g	Chapter 43D Expedited Permitting; PVPC Expedited Permitting Handbook; Chapter 40R
	Entitlements process	Expedited entitlements, permitting, and review processes for TOD projects to lower the cost of development and reduce risk for developers.	Cities/towns	Incentive Housing Zones	Chapter 43D Expedited Permitting; PVPC Handbook; Chapter 40R
	Parking management	Parking management may include a combination of strategies including reduced parking requirements, imposing parking fees and meters, and creating parking districts. Parking reductions can help to make private development more feasible, and helps to support transit ridership. Revenues from parking pricing can help to fund alternative transportation facilities and programs (transit, bike, and pedestrian).	Cities/towns; ConnDOT; MassDOT; CRCOG; PVPC	Parking revenues; local and regional transportation funds	Parking revenues; local and regional transportation funds
New development	Site assembly	Assembly of fragmented and small parcels to reduce holding costs and risks to developers.	Cities/towns; redevelopment agencies		
	Financing market-rate housing	Apply existing multi-family and single-family housing programs to TOD residential projects (including market-rate development); provide loan guarantees to private market-rate development in TOD areas.	States	CHFA Mortgage Programs; Downpayment Assistance Program; Capital Region Development Authority Fund	Housing Development Incentive Program; Urban Renewal Grant; MassHousing Single-Family Loans/BuyCities
	Reuse of historic buildings	Identify existing historic buildings in station areas suitable to convert to multi-family housing or commercial uses.	Cities/towns; redevelopment agencies; CDCs; developers	State Historic Tax Credit; Federal Historic Tax Credit	State Historic Preservation Tax Credit; Urban Renewal Grant; Federal Historic Tax Credit

Strategy	Tools	Description	Lead Actors	Connecticut	Massachusetts
Neighborhood revitalization	Brownfields cleanup	Identify brownfield sites in station areas; prioritize these areas for cleanup to support development	Cities/ towns; redevelopment agencies; state brownfield authorities; DECD; MassDevelopment; U.S. EPA	CT Brownfield Redevelopment Authority/DECD Brownfield Loans; EPA grants	Brownfields Tax Credit/ Remediation Loans/Site Assessment; EPA grants
	Acquisition of vacant/blighted properties	Purchase and hold blighted and/or tax delinquent properties that may be suitable for redevelopment in the short to medium term. Interim uses may include community gardens, farmers markets, food trucks, etc.	Cities/towns; redevelopment agencies; CDCs		
	Affordable and mixed income housing	Add stronger TOD preference to LIHTC QAP; target existing affordable housing funds to TOD areas; redevelop existing public housing development projects to revitalize neighborhoods.	Housing authorities; redevelopment agencies; nonprofits; cities and towns; private developers; states	HUD Choice Neighborhoods; DECD CHAMP; LIHTC; Capital Region Development Authority Fund; Housing Tax Credit Contribution; CDBG/HOME	HUD Choice Neighborhoods; Urban Renewal Grant; Housing Development Incentive Program; LIHTC; CDBG/HOME
Local transportation and infrastructure	Last mile shuttles	Enhance coverage, quality, and frequency of local bus connections from new BRT and rail stations to major destinations outside of the immediate station area.	CRCOG; PVPC; CCRPA; CT Transit; PVTA; other regional transit agencies; economic development organizations; major employers; anchor institutions	Parking revenues; local and regional transportation funds; private employers; anchor institutions	Parking revenues; local and regional transportation funds; private employers; anchor institutions
	Pedestrian and bicycle access	Enhance pedestrian and bicycle paths and facilities to foster walking and biking as an access mode to the BRT and rail stations.	CRCOG; PVPC; CCRPA; ConnDOT; MassDOT; cities and towns	Parking revenues; local and regional transportation funds	Parking revenues; local and regional transportation funds
	Infrastructure improvements	Make strategic investments in streetscaping and "place-making" features at station areas to enhance the attractiveness of station areas for new development and promote the brand of the new transit corridors; Improve basic infrastructure (water, sewer, gas, etc.) to accommodate new, higher-density development in station areas.	Cities and towns; business districts; DECD; MassDevelopment; CRCOG; PVPC; ConnDOT; MassDOT; Utility Companies	Parking revenues; local and regional capital and facilities programs; utilities fees; development impact fees; business improvement districts; Tax Increment Financing (TIF)	Tax exempt bonds; Parkland Acquisition and Renovation for Communities; local and regional capital and facilities programs; utilities fees; development impact fees; business improvement districts; TIF
Economic Development	Economic development incentive programs	Target existing economic development incentive programs to station areas	States	DECD Economic Development & Manufacturing Assistance; CT Innovations programs	State Economic Development Incentive Program (EDIP)
	Anchor institutions	Encourage anchor institutions to expand in transit areas.	Large employers; universities and colleges; hospitals; States; cities / towns; CRCOG; CCRPA; PVPC	Private employers and anchor institutions	Private employers and anchor institutions

Source: JRCo; MassInc.org

Figure 50: Implementation Strategies by Place Type and Station Area

Strategies and Tools	INFILL					OUTREACH	
	Elmwood	Windsor	Northampton	Hartford Union St	West Hartford	Cedar St	Newington Junction
Planning and visioning							
Station area plans	•	•	•	•	•	•	•
Community education and outreach	•	•	•	•	•	•	•
Technical assistance	•	•	•	•	•	•	•
Zoning and land use regulations							
TOD-supportive zoning	•	•	•	•	•	•	•
Entitlements process	•	•	•	•	•	•	•
Parking management			•	•	•		
New development							
Site assembly			•	•			•
Financing market-rate housing	•	•	•	•	•		
Reuse of historic buildings		•	•	•			•
Neighborhood revitalization							
Brownfields cleanup	•	•			•	•	
Acquisition of vacant/ blighted properties							
Affordable and mixed-income housing	•	•	•	•	•	•	•
Local transportation and infrastructure							
Last mile shuttles	•		•		•	•	
Pedestrian and bicycle access	•	•	•	•	•	•	•
Infrastructure improvements	•	•	•	•	•	•	•
Economic Development							
Economic development incentive programs				•			
Anchor institutions			•	•		•	

Neighborhood Revitalization

The station areas grouped in the Catalyze and Reposition place types generally face challenges to implementing TOD due to a concentration of blighted and abandoned properties which deter investment, drive down property values, and depress local revenues. One commonly used strategy to address this at the municipal level is through the acquisition and redevelopment of these properties. In Michigan, the Genessee County Land Bank has been actively engaged in acquiring and renovating vacant residential properties, often as for-sale affordable housing, to promote neighborhood stabilization. The Land Bank also supports the conversion of vacant lots into community gardens and pocket parks.

Some of the former industrial districts contain brownfields, which are properties with real or perceived contamination that require remediation to redevelop or reuse. It is important to develop a plan to address these brownfield properties in order to unlock the potential for TOD. This includes a thorough review of existing environmental documents, additional testing, and a cleanup plan. The U.S. EPA provides varying levels of technical and financial assistance for brownfield redevelopment and sustainable development. There are also a variety of existing state programs that provide financial and technical assistance, including the Connecticut’s Brownfield Redevelopment Authority and Department of Economic and Community Development grants, as well as Massachusetts’ Brownfields Tax Credits, remediation loans, and site assessments. The City of Holyoke has taken advantage of the EPA Brownfields program, recently receiving \$200,000 in grants to clean up the former Mountain Road Firing Range site, to be converted eventually into open space and single-family housing. Holyoke also received assistance from the state to clean up a former brownfield that is now the home of the Massachusetts Green High-Performance Computing Center.

OUTREACH		CATALYZE						REPOSITION		
Berlin	East St	Windsor Locks	East Main St	Enfield	Kane St	New Britain CBD	Sigourney St	Holyoke	Springfield	Park St
•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•

Affordable housing and mixed-income housing development in transit locations is another example of a neighborhood revitalization strategy that accomplishes multiple objectives:

- 1) Preserving the affordability of the transit corridor to low-income households to ensure they benefit from the increased transportation options; and
- 2) Establishing higher-density development in station areas that currently lack the ability to attract private development.

By broadening the income mixes for new developments, potential developers might be able to access Targeted Financial Incentives and other financing tools for closing the gap between market prices and cost of construction in station areas with longer term outlooks for TOD potential. High quality affordable housing and mixed-income projects, such as Metro Green in Stamford, CT, are able to prove the capabilities of an area to developers and potential residents. This strategy is one that needs to be tailored to the individual station and will require a more refined survey of housing markets and affordable housing needs at the local level. The character, age and value of housing, rent/own mix, and quantity and location of existing affordable housing will inform how the strategy is applied. In some places, there may not be much existing affordable housing in the transit station area, and the development of new affordable units may be deemed appropriate. Meanwhile, other station areas, such as Springfield and Holyoke, may have a concentration of existing affordable housing, and the introduction of more market-rate units may be desirable. The HUD Choice Neighborhoods planning and implementation grants are targeted towards the transformation of distressed neighborhoods with an emphasis on the preservation and rehabilitation of

public, HUD-assisted housing units, fostering stronger connections to schools, public facilities, transportation, and jobs.

Local Transportation and Infrastructure

Transit-oriented development supports transportation choices, which include transit use, walking, and bicycling. Investments in pedestrian and bicycle infrastructure could further bolster the ridership on the BRT and rail corridors. Promoting bicycle travel can also make it easier to access major destinations that are beyond the half-mile radius of the station area. Similarly, providing last-mile shuttles to these destinations will maximize the effectiveness of the new BRT and rail investments and add value to the transit locations.

Deficient infrastructure is a critical barrier to new development in the older communities along the transit corridors. Many of the station areas require upgrades in basic utilities, stormwater, and wastewater infrastructure to be able to accommodate higher density development. This is a high-cost expense that cannot be realistically borne solely by new development. Providing regional and state funds to address the infrastructure challenges will be a vital component to implementing TOD in the Knowledge Corridor.

Economic Development

As described earlier, coordinating the expansion of anchor institutions within station areas is a key regional strategy for supporting TOD in the Knowledge Corridor. University or hospital expansions create a powerful driver of demand for ancillary real estate, such as student housing, retail and medical offices. Within the Knowledge Corridor, there are currently several important near-term opportunities for CRCOG, CCRPA and PVPC to partner with anchor institutions to expand within station areas. Further information on the region's anchor institutions is included in Appendix E.

- **Central Connecticut State University (CCSU):** CCSU's 12,000 students make it second to only the University of Connecticut in terms of public institution enrollment in the state. Due to the size of the institution and its proximity to the Cedar Street and East Street stations, CCSU represents one of the best opportunities for anchor institution-led TOD. Currently, CCSU is a school that is mostly comprised of in-state students living off-campus and/or commuting, a situation that the university would like to address by building student housing on-campus. To that end, the CCSU is planning a significant expansion in the Cedar Street station area. The expansion, called the East Campus, is planned to include 300-plus units of student housing, a new fitness center and playing fields, facilities for the Fine Arts Department, a day care facility, and a 1,000-space parking garage. There may also be opportunities for additional university-sponsored developments, including retail and/or additional student housing. An important element of CCSU's plan is a pedestrian connection from the East Campus back to the main campus that bridges Route 9,



to ensure the two campuses function as one. The East Campus plan, which is scheduled to begin within a short time period, will transform the Cedar Street station area, currently characterized by vacant and under-utilized sites. To ensure that the East Campus plan is consistent with TOD principles, city staff, CRCOG, CCRPA and the state should be engaged in the planning process. It will be important to put into place a land use plan that permits higher-density, mixed-use development on adjacent parcels, and to create a strong pedestrian and bicycle network to connect the campus to the transit station, while minimizing the visual and design impacts of the parking garage. The East Campus expansion will also better connect CCSU to the CT *fastrak* system, which could create demand for student housing at other stations along the line, due to the rapid, frequent transit connection. It also creates opportunities to integrate CCSU with other educational institutions accessible by transit, such as Trinity College, UConn Health Center, UConn School of Business, and the UConn Hartford campus.

- **University of Connecticut (UConn):** The addition of other UConn programs to downtown Hartford and other station areas could further support TOD at the station areas and the expansion of the CT *fastrak* and NHHS rail systems as an option for students to travel between institutions. Currently located in West Hartford, the UConn Hartford satellite campus will soon relocate its 2,100 students and 60 faculty members, including the UConn School of Social

Work, to downtown Hartford. This move will further expand the number of students in downtown Hartford and build demand for multi-family student housing. Additionally, the UConn School of Medicine, located at the UConn Health Center in Farmington, consists of 3,000 graduate students and will be accessible via a shuttle connection to *CTfastrak*. The addition of rapid transit could be a significant benefit to medical students, who will be able to travel between UConn Health Center, Hartford Hospital and St. Francis Hospital on a one-seat ride.

- **University of Massachusetts:** The creation of a satellite University of Massachusetts campus in downtown Springfield has been discussed, potentially to include a school for physician’s assistants, which would meet the growing need for a skilled health care workforce and complement the existing Pioneer Valley Life Sciences Institute in Springfield. This move is strongly encouraged, as it could support multifamily housing and encourage the expansion of the health sector in downtown Springfield.

CONCLUSIONS

The Regional TOD Strategies and Station Area TOD Strategies sections demonstrate some of the implementation strategies that exist to lay the groundwork for TOD in station areas. The strategies include multiple levels of government as well as many of the region’s prominent non-profit insititions and employers. Achievement of a paradigm shift away from the region’s past patterns of sprawl development to an infill, TOD pattern will require coordination between these many actors.

These TOD implementation strategies reinforce a concept recently described in a report released by the MassINC’s Gateway Cities Initiative. In it, Alan Mallach, Benjamin Forman, and Margaret Keaveny identify “transformative redevelopments” as a key to the future vibrancy of Massachusetts’s Gateway Cities. Transformative redevelopments are defined as investments that can bridge the existing market gap and “restore the healthy function of private markets.”⁴⁹ Many of the TOD implementation strategies presented in this section, such as support of anchor institution expansion, would provide opportunities for transformative redevelopment in the station areas.

Even without the power of transformative redevelopments, there is opportunity to capitalize on the modest growth in demand projected in the region. As described earlier, the Consultant Team estimates that over the next 25 years there will be demand for 9,000 to 12,000 new TOD housing units and 50,000 new jobs in TOD-supportive employment sectors. The strategies presented in this section describe steps that government bodies can take to ensure that the station areas are well-positioned to absorb this demand. Relatively small steps taken today will ensure the station areas are attractive to substantial TOD investment in the future.

⁴⁹ Forman, B., Keaveny, M. & Mallach, A. (2015). Transformative Redevelopment: Strategic State Policy for Gateway City Growth and Renewal. (Report.) MassINC.

Corridor TOD Implementation Maps

The previous Regional TOD Strategies and Station Area TOD Strategies sections described the steps government bodies in the Knowledge Corridor can take to build regional demand for TOD, through targeting state investments and engaging anchor institutions, as well as the steps to encourage new supply of TOD at the station areas through adopting policies consistent with each station's typology. In this final section, the Consulting Team presents these findings in graphic corridor maps for the NHHS Rail/Vermont corridor and the *CTfastrak* corridor. These maps summarize the recommendations contained within the TOD Strategies section of the report and serve as a snapshot guide of the opportunities to develop TOD in the region. These maps represent the short-term (less than 5 year) opportunities. Additional opportunities are likely to evolve as transit and rail service is established, and the market for TOD in the BRT and rail corridors strengthens.

Figures 51 and 52 summarize the recommendations of the Consulting Team for short-term TOD in the following categories:

- **Station area typology**
- **Recommended density of new TOD;**
- **Recommended use or mixture of uses; and**
- **Presence of anchor institutions and/or opportunities for state investment.**

By laying out the type, density, and major assets of the station areas, the opportunities for TOD in the corridors can be viewed holistically, with stations ranging from lower density, mostly residential town centers with service-based commercial to large employment centers and regional destinations with broader development opportunities. The corridor plan symbols are as follows:

Density:

Low – Two or less stories, including townhome-style residential

Moderate – Three to five stories

High – Greater than five stories

Land Uses

R – Residential uses (although this may include smaller service based retail such as shops and restaurants)

MX – Mix of residential and commercial uses, which may include commercial office

The station area color corresponds to its typology as shown in Figure 48. The remaining symbols denote where regionally-important anchor institutions and/or state investment opportunities exist.

Figure 51: NHHS/Vermont Rail Corridor Map

