



METRO HARTFORD FUTURE

ACCELERATING SHARED AND SUSTAINED ECONOMIC GROWTH

A Comprehensive Economic Development Strategy for the Capitol Region

APPENDIX



APPENDIX

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1. Summary Background

Talent

Demographics

Demographics pose a major challenge in the Hartford region, as in many other places around the country. The Hartford region has seen a similar post-recession growth and decline rate as the state of Connecticut, with a steady increase in population increase between 2000 and 2010, and a **relatively flat/stagnant rate of growth since 2010**. Between 2010 and 2017, the population has remained nearly level, estimated at 974,035 for the Capitol Region in 2017.

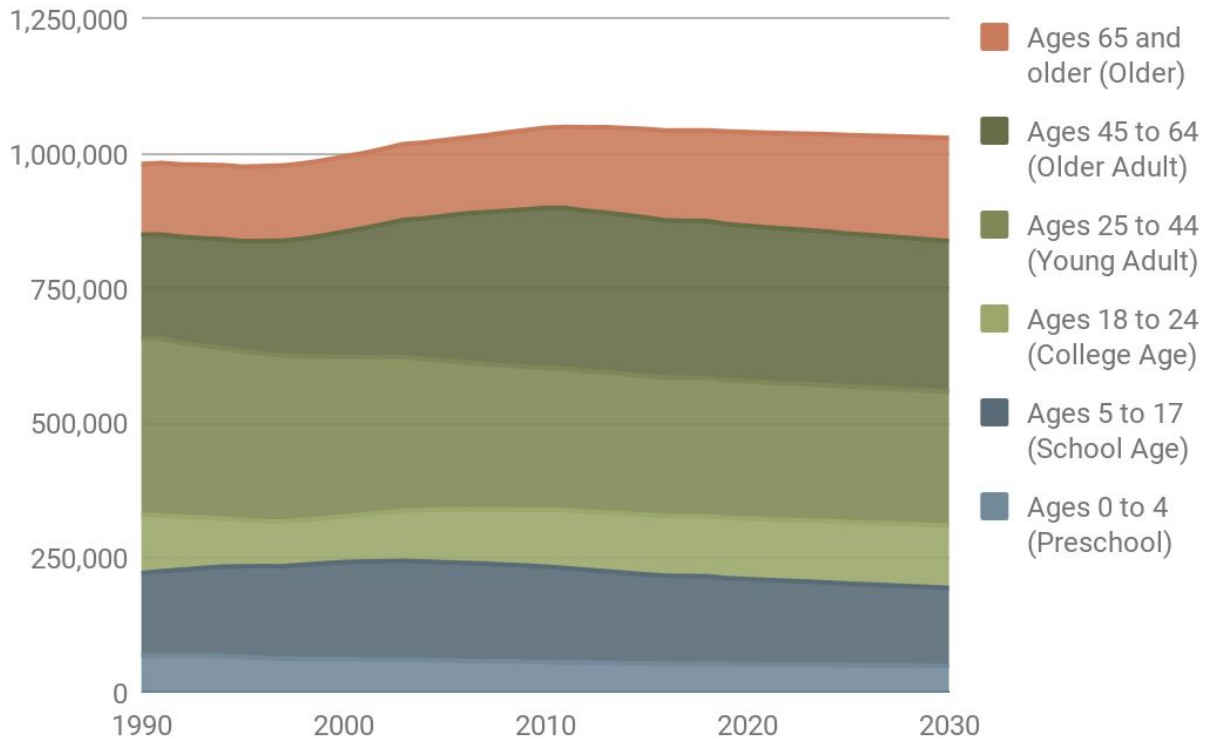
Table: Population Change

Region	Population 2000	Population 2010	Population 2017	Population Change 2000-2010	Population Change 2010-2017
Capitol Region	924,091	973,959	974,035	5.40%	0.00%
MSA	1,1508,72	1,212,381	1,210,259	5.30%	-0.20%

Although the population has been stagnant at a regional scale, there has been more variation among the region's individual communities. Many of the individual communities in the region—generally smaller communities—have seen modest population gains. The cities, however, have lost population, with Hartford, East Hartford, West Hartford, and New Britain all decreasing since 2010. For more information on recent population trends, with a table of data for each town in the region, please see the appendix.

Looking forward, the **population is expected to decline slightly** in coming years under current trends. During the next decade, more people will move into the 65-years-and-older age group. As the over-65-year-old age group dramatically increases its share of the regional population, each sub-group of under-65-year-olds will decrease, except for 18-24 year-olds (likely a result of the region's concentration of higher education institutions), as seen on the following graphic.

Population Change and Forecast by Age Group



On top of the overall projection of population decline, these demographic conditions pose a dramatic challenge to the region’s future economic needs. The table below captures the specific numbers of projected population change by age group. As the older population contingent within the Hartford region workforce ages out of employment, young people will make up a much larger percentage of the working population in the region. But, under these projections, **the number of people in prime working age groups (18-64 years-old) will decrease** (by about 3%). Compounding this is the challenge that employment and labor force participation rates—as well as wages—for 18-24 year olds are generally much lower than older age groups. Meaning that the effect on actual employment and economic output will likely be even more dramatic. This is the crux of the demographic challenge facing the regional economy.

Population by age	2016	2030 (e)	% Change
Ages 0 to 4 (Preschool)	54,781	49,891	-9%
Ages 5 to 17 (School Age)	167,889	144,690	-14%
Ages 18 to 24 (College Age)	110,211	115,912	+5%
Ages 25 to 44 (Young Adult)	258,738	248,452	-4%
Ages 45 to 64 (Older Adult)	295,012	279,313	-5%
Ages 65 and older (Older)	161,385	191,630	+19%

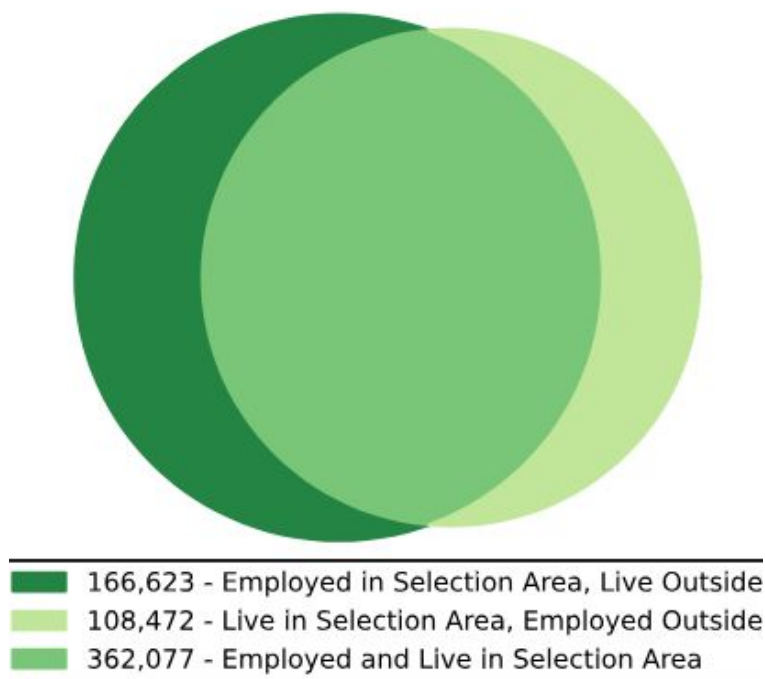
One further way to succinctly capture these challenges is through a statistic referred to as the *dependency ratio*, which takes the ratio of a region’s 18-64 year-old population to its population below 18 and above 65 (i.e., those outside of prime working age).¹ In 2006, Metro Hartford’s age dependency ratio was 56.8 compared to the US at 58.9, meaning that a greater percentage of Metro Hartford’s population was in the 18-64 age range. As of 2016, Metro Hartford’s dependency ratio had grown to 58.4, and the US’s had grown to 61.3, with Metro Hartford still enjoying a greater-than-average concentration of workforce-aged population. But the Hartford region has a disproportionately high percent of its population in the 65+ age group and a disproportionately low percent in the under-18 age group, compared to the US. This suggests that Metro Hartford’s rate of age dependence is likely to worsen, as its population further concentrates in the 65+ age group, with relatively fewer young people to replace the workforce. The inescapable conclusion is that Metro Hartford must grow its population among younger age groups through migration to achieve growth in coming years.

¹ Note: the specific age groups bands used in capturing dependency ratios can vary—for instance, some analyses cut off the young dependent population at 16 years old. Comparisons of multiple ratios, therefore, must consider the same population groups, but the premise is always the same.

Employment

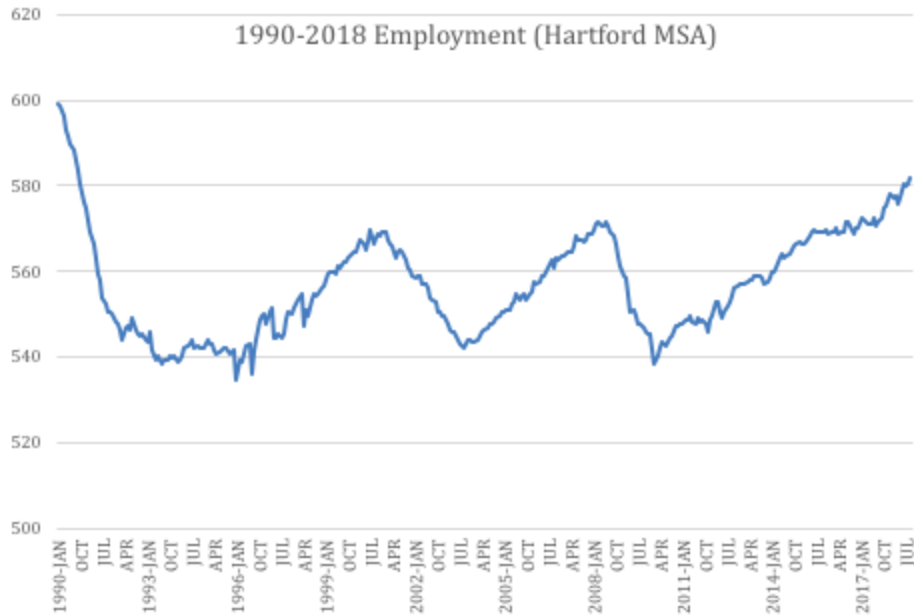
The Metro Hartford region is a major employment center—home to over half a million jobs, and a similar number of employed residents. But not all those who work in the region live in the region, and vice versa. However, **a majority of employed residents in Hartford and Tolland Counties work within the region.** In 2015 (the most recent year for which this data is available) 362,077 residents both lived and worked in the region, while 166,623 commuted from outside and 108,472 commute out of the region for work.

Inflow-Outflow Job Counts, 2015



Source: US Census Bureau

While the region is a major job center, it is having an increasingly difficult time emerging from recessions. In fact, based on a long-term analysis of employment data, the region has yet to recover from the recession of the early 1990s. As shown in the chart below, the region has recovered the jobs lost in the 2008 recession and the employment level now exceeds the early 2008 pre-recession peak. Looking back though, the region is still about 18,000 jobs under the 1990 peak.



An ongoing challenge for the region will be to ensure that all population segments are ready to contribute to and benefit from the region’s economic growth. Some part of this puzzle involves educational institutions and, specifically, college students (which we will discuss in more detail among the other two goal areas). But there is also significant opportunity to improve economic engagement among the existing population. Metro Hartford will need to pay close attention to minority, women, and immigrant labor force participation. “Untapped” workers—youth not working or in school, low-skill adult workers, those without employment, those with limited english proficiency, veterans, and those with disabilities—present a significant challenge and opportunity in terms of workforce development. Altogether, in 2014 **more than 37,000 potential workers in the region were “untapped.”**

At the same time, **a majority of job openings expected in the Hartford region from 2016-2022 (51%) will likely be middle- and high-skill jobs.**² In order to meet employer demand for talent and ensure the economic benefits of these jobs stay in the region, industry-driven training will remain an important tool for the region’s growth.

Number Unemployed by group, 2014

	Total	Limited English Proficiency	Veterans	People with Disabilities	Foreign born
Opportunity Youth (not at work or in school, 16-24)	8,489	307	-	1,454	452
Low-skill adults	14,657	2,784	551	2,107	4,411

² CRCOG, Connecticut Department of Labor, 2012 - 2022 job projections

(HS Grad, 25-64)					
Middle-skill adults (Some College/training, no bach. degree, 25-64)	8,059	334	1,684	1,759	951
High-skill adults (Bach. degree & higher, 25-64)	6,554	767	226	806	997
Total	37,759	4,192	2,461	6,126	6,811

Source: CRCOG, IPUMS-USA, University of Minnesota, ACS 2014, CRCOG Region

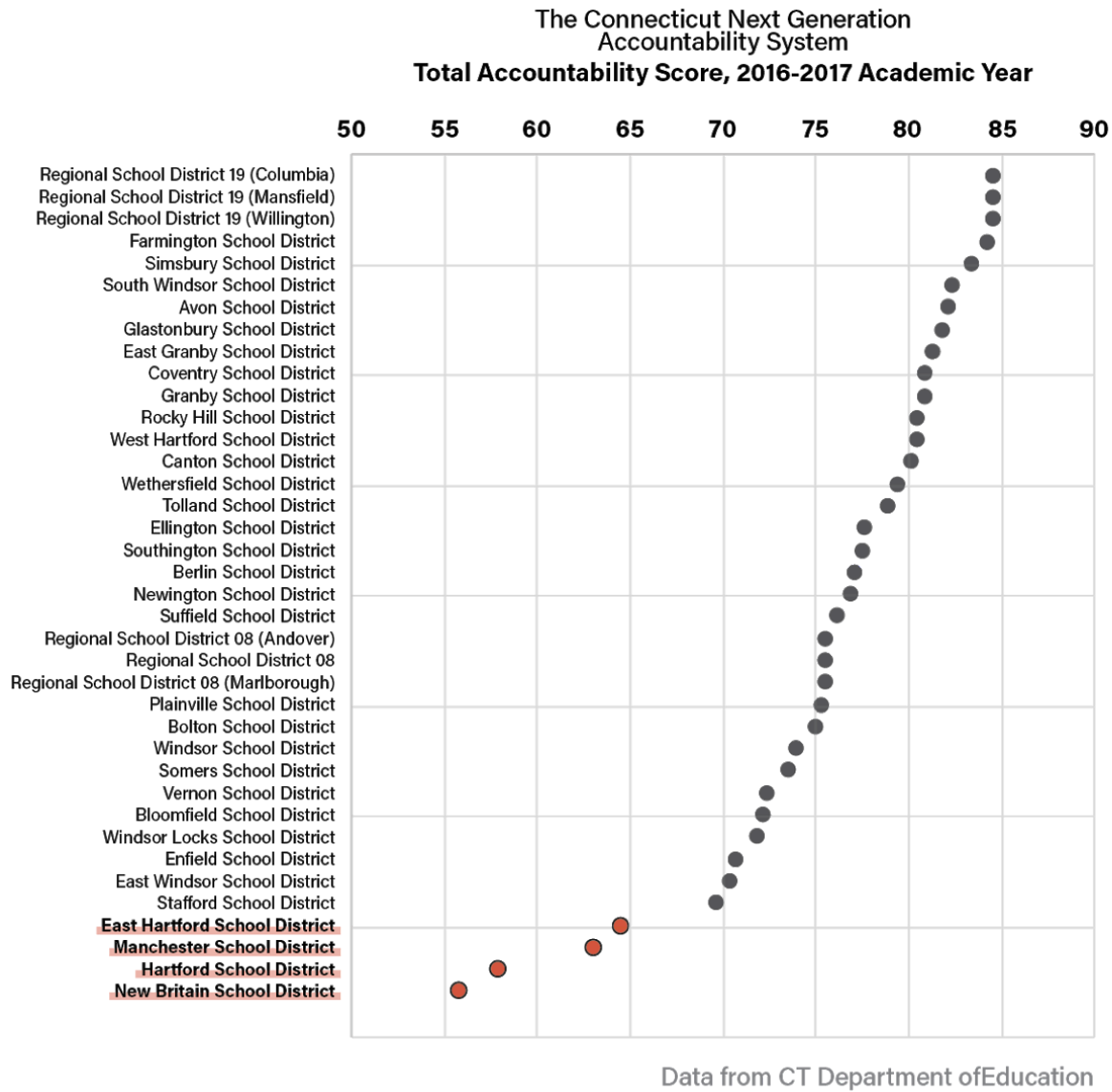
K-12 Education

Most communities in the region have their own school districts. There are 34 separate school districts in the 38-municipality region. Educational outcomes and intra-school disparities vary dramatically across these schools.

The larger, urban school districts—Hartford and New Britain especially—have higher rates of absenteeism and suspensions than most other school in the region. Hartford also has uncommonly low graduation rates. The four-year graduation rate in Hartford for the 2015-16 school year was 71%—much lower than the region in total (87%), as well as state and national averages. The NextGen Accountability System measure these and other data to track disparities in educational outcomes across schools and districts in Connecticut. As shown in the graphic below, Hartford, New Britain, and the other urban districts perform poorly compared to the rest of the region.

The effects of these educational disparities and poor educational outcomes are evident beyond schools. The significant population of “Opportunity Youth” discussed on the previous page are largely a product of the failings of primary and secondary schools. And challenges with, and misconceptions about, life after high school are affecting the entire state of Connecticut. **The majority (51%) of Connecticut high school graduates have not received a college degree six years after graduating.** Creating the workforce of tomorrow will require the region’s primary and secondary schools to improve educational disparities, and better equip more young people to participate in productive, high-wage careers.

NextGen Accountability Index: Education Disparities in the Region



Connecticut's Next Generation Accountability Index "is a broad set of 12 indicators to provides a more holistic, multifactor perspective of district and school performance and incorporates student growth over time."

Higher Education in the Region

Higher education undoubtedly ranks highly among the Hartford region's key assets, and higher-education institutions have a vital role to play in shaping the region's future workforce. The local higher-education community is robust, with 17 post-secondary institutions and around 80,000 students. In a region with a declining workforce and stagnant, aging population, the

colleges and universities that call the greater Hartford community home offer a particularly compelling opportunity to strengthen the region's economy by building on the extensive existing institutional infrastructure.

However, the region has yet to fully capture the economic benefits of its robust higher education system. Brookings Institution researcher Jonathon Rothwell (a leading authority on the economic impacts of higher education) and his colleagues have published a variety of data on the impact of colleges on students and communities. The Brookings data ranks several schools in the Hartford region very highly on measures of value-added impact on graduate income.³ For instance, the University of Connecticut is in the 88th percentile of schools for value added, and Capitol Region Community College is in the 95th!

Yet, much of that added value is going elsewhere, for the region fares poorly on post-graduate retention. In fact, a separate dataset from the same research team lists the Hartford MSA as one of the worst large metro regions in the country in terms of college graduate retention from both two-and-four-year institutions, with a **combined retention rate of just over 40% of graduates** (driven largely by University of Connecticut, the largest school).

To some extent, the dynamics driving the situation go far beyond the Hartford region. Throughout the country, many more college students are going out-of-state for school. Often, their tenure in the community where they attend school then ends with their graduation. As a state, Connecticut exports more college attendees than it imports. Among public schools, the state exports students at a 2.8-to-1 ratio—that is, almost three students leave Connecticut to go to school elsewhere, for everyone one student that comes from another state to attend a public university in Connecticut.⁴ The infusion of young people from elsewhere coming into the state (and specifically the Hartford region) represents a great opportunity, but the challenge of converting students who would otherwise be here temporarily into permanent residents of the region remains.

3

<https://www.brookings.edu/research/using-earnings-data-to-rank-colleges-a-value-added-approach-updated-with-college-scorecard-data/>

4

<https://www.nytimes.com/interactive/2016/08/26/us/college-student-migration.html?mtrref=www.google.com>

Invest

Housing

Housing is one of the most valuable pieces of physical infrastructure in any place. In Metro Hartford, the housing stock is a major asset, and has a key role to play in strengthening and growing the local economy. But the region also faces challenges related to housing.

In 2017, there were around 508,000 housing units in the Hartford Housing Market Area (HMA), which is the same geography as the Hartford MSA. 92% of those were occupied—higher than the national average. Of occupied units, 67% were owner-occupied and 33% were renter-occupied, which is similar to the average across the US. The homeowner vacancy rate was 1.7% and the rental vacancy rate was 6.7%—both also like the national averages.

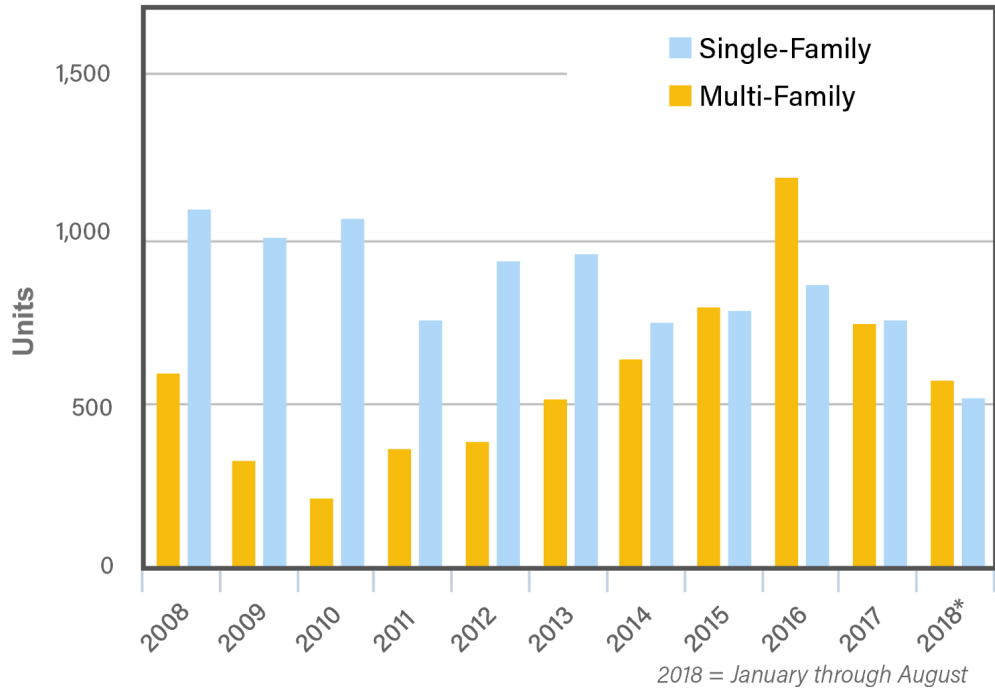
Relative to the country at large, Metro Hartford has disproportionately little very-high-value housing (\$500,000+) homes, but it has a surplus of high-value homes between \$300,000 and \$500,000 in value. This range accounts for one-fourth of all owner-occupied housing units in the Hartford HMA.

Median rent paid for rental units is just over \$1,000 per month. This is like the national average, and much lower than many urban areas in the Northeast—which contributes to Metro Hartford's **relatively low cost of living for the Northeast region**. However, demand in the rental market has risen in recent years, and HUD analysts forecast a **demand of over 3,700 new rental units** between 2017 and 2020 in the Hartford HMA.

HUD also forecasts an increase in owner-occupied housing in coming years of around 3,000 units (which is more modest relative to the total owner market). According to HUD analysis of CoreLogic, Inc., data, the average housing sale price in the HMA for the twelve-month period ending in August of 2017 was \$253,700—a 2% decrease from the preceding period. That average sale price is also well below the average market value of around \$284,000—which suggests that **lower-value homes are in higher demand**.

Some new building activity has sought to accommodate both owner and renter demand in recent years. The graphics below shows newly built housing units by year since 2008. Still, demand forecasts from HUD suggest that **more housing will be needed in coming years** (over 3,700 units—just under current projections), and the current rate of new building will not meet that demand, especially in multifamily housing. Furthermore, to create the market for additional restaurants and retail in downtown Hartford, a significant amount of new housing will needed.

New Housing Construction Completion by Type, Annually 2008-2018



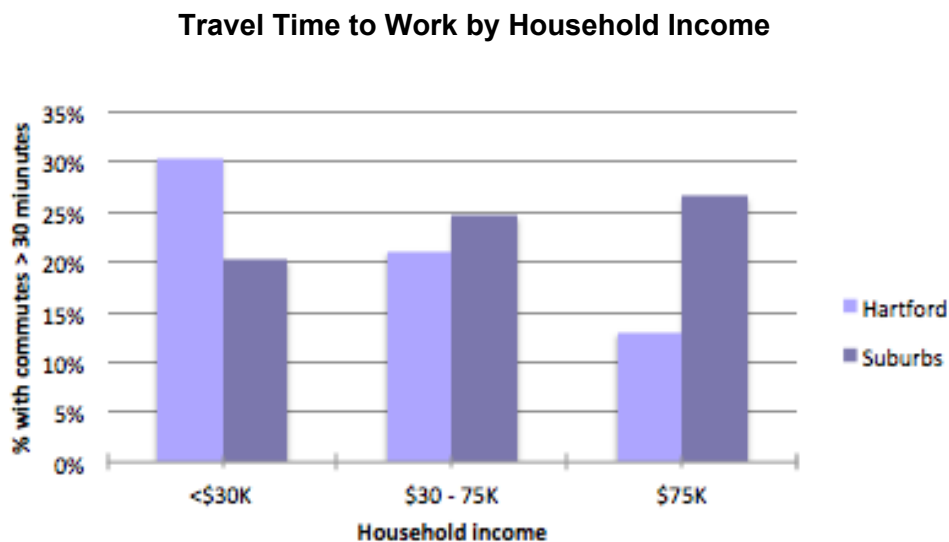
Source: HUD, Office of Policy Development and Research

Transportation

Closely related to the challenges of housing are those of transportation. This includes everything from commuting patterns to inter-regional transportation

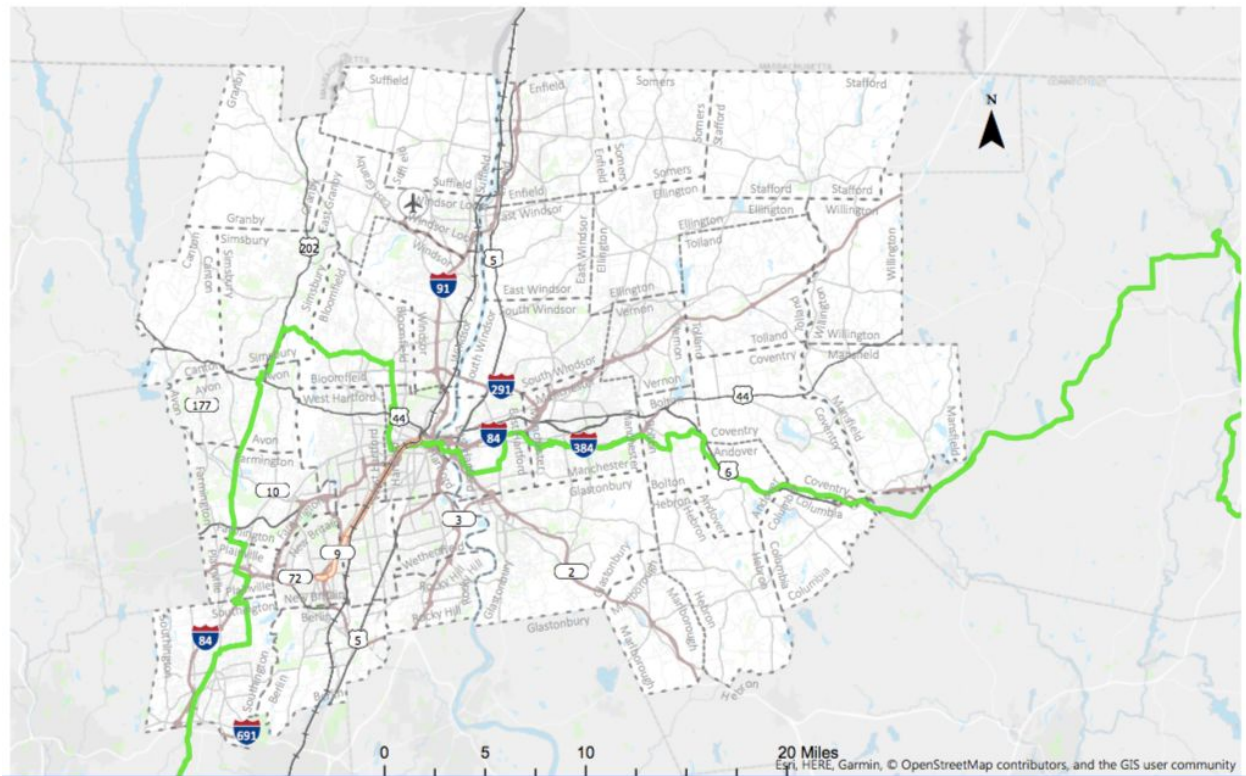
Travel time to work can make an enormous difference in the level of satisfaction that people have in their communities. In the Hartford region, **travel time to work is about average** both within the state and nationally. In Hartford County, the average travel time in 2016 was 23 minutes and in Tolland county it was 26 minutes. The average for both the state of CT and the US was 26 minutes.⁵

Breaking down travel time by household income within the region yields interesting results. While travel time to work increases with income level for the suburbs, travel time decreases with income level within the city of Hartford. This indicates that higher-paying jobs are likely concentrated within the capital and that lower-paying jobs require more travel time for those living in the city. This point is troublesome when compared with income figures: **lower-income households living in the city must travel more for their jobs, and the cost of transportation will be more burdensome in these households.**



⁵ Census ACS 5-year Estimate

Alternative modes of transportation alleviate traffic congestion and can provide affordable, convenient access between key locations within the region. The map below shows the Hartford region's transportation assets, including the **CTfastrak**, the **Hartford Line**, **Bradley Airport**, and the **East Coast Greenway**.



CRCOG Region | Transportation Assets

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- Eastcoast Greenway
- CTfastrak
- Hartford Line
- Bradley Airport

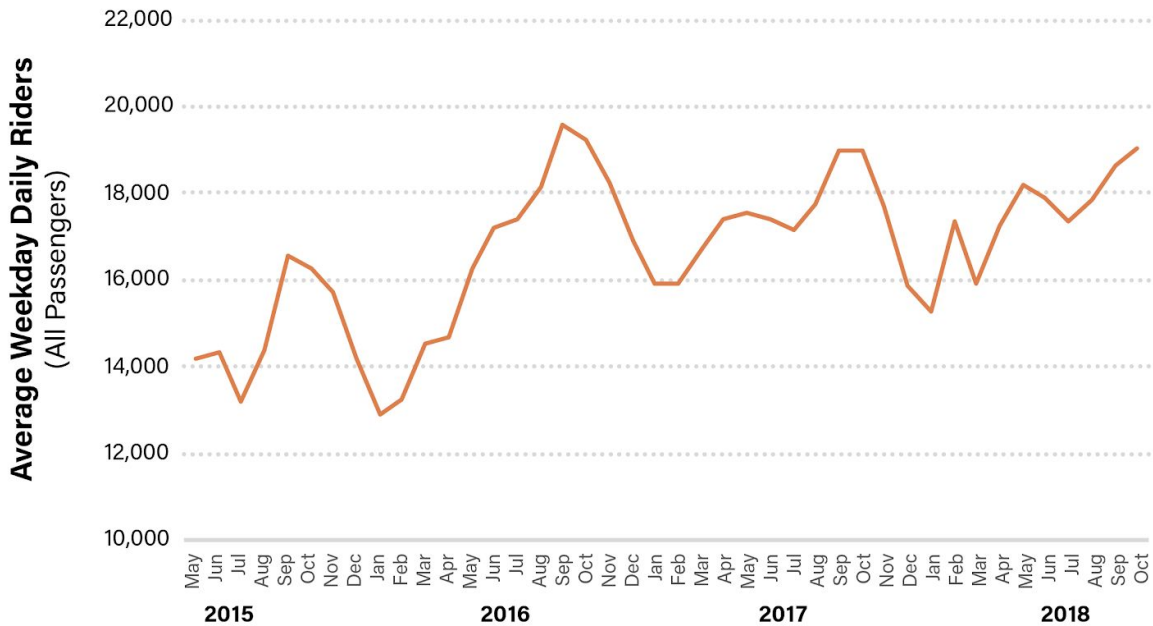
The Hartford Line (shown above) opened in June 2018 and provides rail service between New Haven, CT and Springfield, MA., expanding transit options even further for regional travelers and commuters. In its first two months, ridership was higher than expected.⁶ Average Weekday ridership is around over 1,800 rides, a figure that the state hopes to increase even further in coming years. Prior to the start of the Hartford Line in June, Amtrak transported about 725 passengers a day between Springfield and New Haven. As of October 2018, CTDOT is already working with Amtrak to add new trains to alleviate congestion and adding an additional trip each day due to demand.

CT**fastrak** is a bus rapid transit option that runs from downtown Hartford to New Britain. CT**fastrak** opened in 2015 providing a vital service along its route. According to data released in April 2018 by the Connecticut Department of Transportation, the primary CT**fastrak** service has provided nine million rides since May of 2015. The broader CT**fastrak** corridor has provided over

⁶ Connecticut Department of Transportation

15 million rides, exceeding initial projections. A report by the Accessibility Observatory at the University of Minnesota, "Access Across America: Transit 2016", lists Metro Hartford as one of the ten fastest growing regions in terms of the number of jobs accessible by public transportation (in combination with walking within 60 minutes). Of the 49 largest metropolitan areas in the country, Metro Hartford showed the ninth greatest improvement in accessible jobs, increasing by 6.44% between 2015 and 2016.

CTfastrak Weekday Ridership



Source: Connecticut Department of Transportation

Diverse transit options, including rail and bus service, as well as alternative transportation (e.g., walking/bicycling infrastructure) are critical to the region's economic development in two ways. On one hand, transportation infrastructure is a vital component of the quality of place that Metro Hartford needs to develop and strengthen to attract a young and talented workforce to the region. On the other hand, that same transportation infrastructure can remove a key barrier to economic engagement that hinders many of the region's current residents—including opportunity youth and unemployed/non-working adults.

Amenities

Attracting and retaining talent hinges on cultivating and maintaining regional amenities to make the Hartford region a great place to live. Competitive regions collaborate to leverage their strengths and appeal to a wide audience and cross-promote their quality of place assets. Younger generations are looking for **dense, walkable places to live with plenty of recreation and entertainment nearby**. This is true across the country, as well as in Metro Hartford specifically.

Current Location and Preferences by Age, 2018

	Age				
	18 - 20	21 - 34	35 - 49	50 - 65	66+
Now live in a suburb where most people drive to most places	35%	41%	51%	51%	53%
Would like to someday live in a suburb where most people drive to most places	4%	8%	3%	9%	13%
Now live in a walkable area with shops and restaurants	47%	40%	25%	25%	32%
Would like to someday like in a walkable area with shops and restaurants	59%	44%	41%	45%	39%
Desire for amenities	12%	4%	16%	20%	7%

Source: *Housing Policy Brief, Legislative Commission on Aging, CRCOG and CCAPA.*

While many respondents in the above survey data live in a suburb where most people drive to most place, very few respondents indicated that they would like to live in such a place in the future, especially among the younger age groups. On the contrary, the rate at which respondents reported wanting to live in walkable areas was much higher across all age groups. And the greatest interest in living in this type of area was among respondents aged 18-20.

The fact that Metro Hartford shares these challenges (developing the infrastructure and amenities that young professionals seek) with so many other regions only makes the situation more critical. Many areas in the US will have fewer workers in ten years than they do today. The competition for young workforce especially will not be easily won, but it will determine the long-term economic success of many places, Metro Hartford probably among them. The regions must invest in its quality of place now.

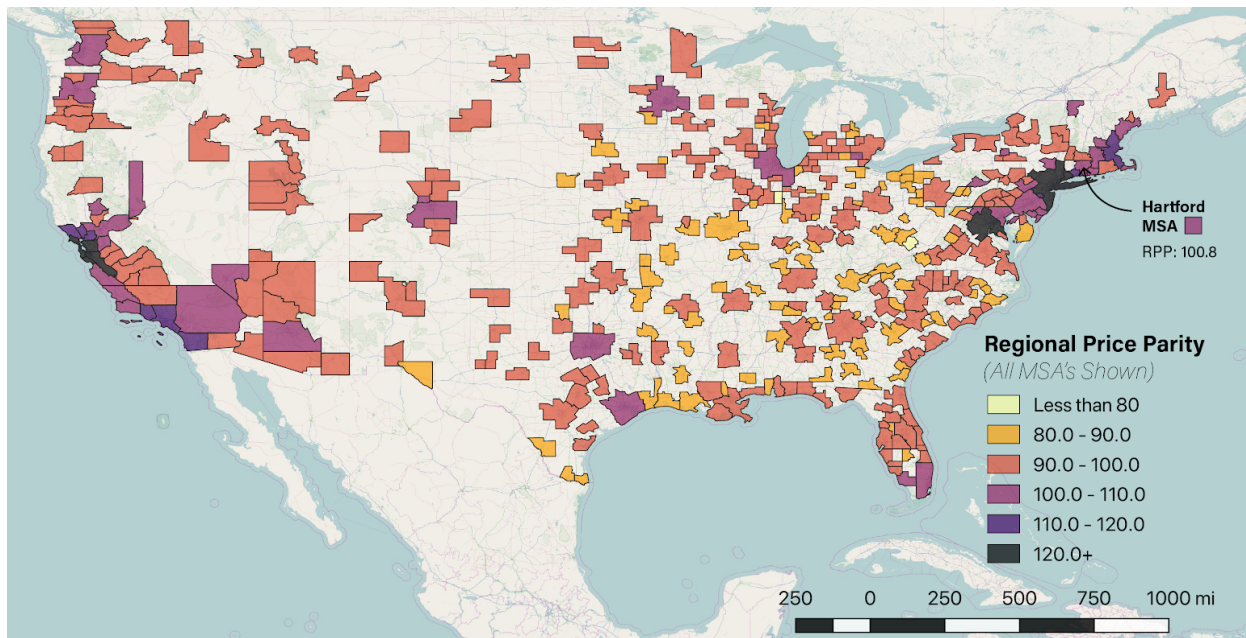
Brand

Regional Location & Cost of Living

The region enjoys a strategic location in the center of the large market of the Northeast US. The Boston and New York MSAs are located within drives of two hours or less, the region lying on the edge of the New York commuter shed. The total population in 2015 within a 50-mile radius of downtown Hartford was 4 million persons, with 44.4 million living within a 200-mile radius so a very large market can be served by businesses located in the Region.

The region also has a lower cost of doing businesses and cost of living, especially compared to other Northeast metros. The lower cost of office and warehousing space, especially in Hartford, are attractive to a variety of industries, especially those where transportation cost is not an issue. And cheaper housing and living is an asset to the workforce. A common method of comparing costs (consumer goods, rent, etc.) using data across geographies is by looking at Regional Price Parity (RPP). The map below shows the RPP for each metro area in the country. Metro Hartford is about average, at 100.8 (across all goods and services), and positioned between many of the highest-cost metros in the country.⁷For comparison, the RPP was 111.4 in New Haven, 122.2 in New York, and 111.1 in Boston.

Regional Price Parity Map, MSAs, 2016



⁷ An RPP of 100 refer to prices that equal that national average. RPPs for metro areas range from 76.6 (Beckley, WV) to 122.2 (New York City).

Economic Position within Connecticut

The table below presents a comparison of the economic performance of the Metro Hartford region to the state of Connecticut for summary economic and demographic variables. It shows that the region accounted for about 30 to 35% of total Connecticut employment and gross state product in 2017, although its share of total CT personal income was substantially lower at just 25%. The levels of per capita income, wages, and productivity (e.g., gross regional/county product per worker) are lower than the statewide figures, although this is due primarily to the high level of economic activity in Fairfield County in the southwestern corner of the State (adjacent to New York City). The table also shows that average annual growth rates for most of the major economic and demographic variables between 2000 and 2017 in the two CRCOG counties were slightly above the statewide rates over the same period.

CRCOG - Performance vs. CT for Selected Variables				
Variable	2017 Value	% of CT	Avg. Annual Growth Rate 2000-2017	Above State?
Total Nonfarm employ.	567,800	33.7%	0.1%	Yes
Non-Mfg. employ.	512,400	33.5%	0.3%	Yes
Goods-producing employ.	73,700	34.1%	-1.5%	Yes
Priv. Services-providing employ.	412,200	33.3%	0.4%	Yes
State & Local Gov. employ.	76,000	35.4%	0.0%	Yes
Personal Income (Millions)	\$ 61,812.4	24.6%	3.0%	No
Wage Disbursements (Millions)	\$ 37,422.5	33.1%	2.6%	Yes
Average Annual Wage, (Thous.)	\$ 65.9	98.1%	2.5%	Yes
Per Capita Income (Thous.)	\$ 59.0	84.3%	2.7%	No
Gross County Product (Millions)	\$ 80,172.5	30.5%	2.7%	No
Total population	1,046,900	29.2%	0.3%	Yes
Pop. 25 thru 64	721,200	29.0%	0.2%	Yes
Households	402,600	29.4%	0.3%	No
Total Retail Sales (Millions)	\$ 17,713.5	28.8%	2.8%	Yes
GCP per worker (\$ per job)	\$ 141,210	90.6%	2.6%	No

Note: data refer to Hartford and Tolland Counties combined; growth rates refer to nominal dollars.

The table also shows a relatively large and diverse regional economy. Total employment in 2017 was approximately 567,800 jobs in the two CRCOG counties, and 638,600 in the total MSA. An IHS Markit analysis of the Shannon-Weaver Index of structure diversity yielded a value of .81 for the MSA in 2017, which is a relatively high value. (The higher the value, the more diverse a regional economy.)

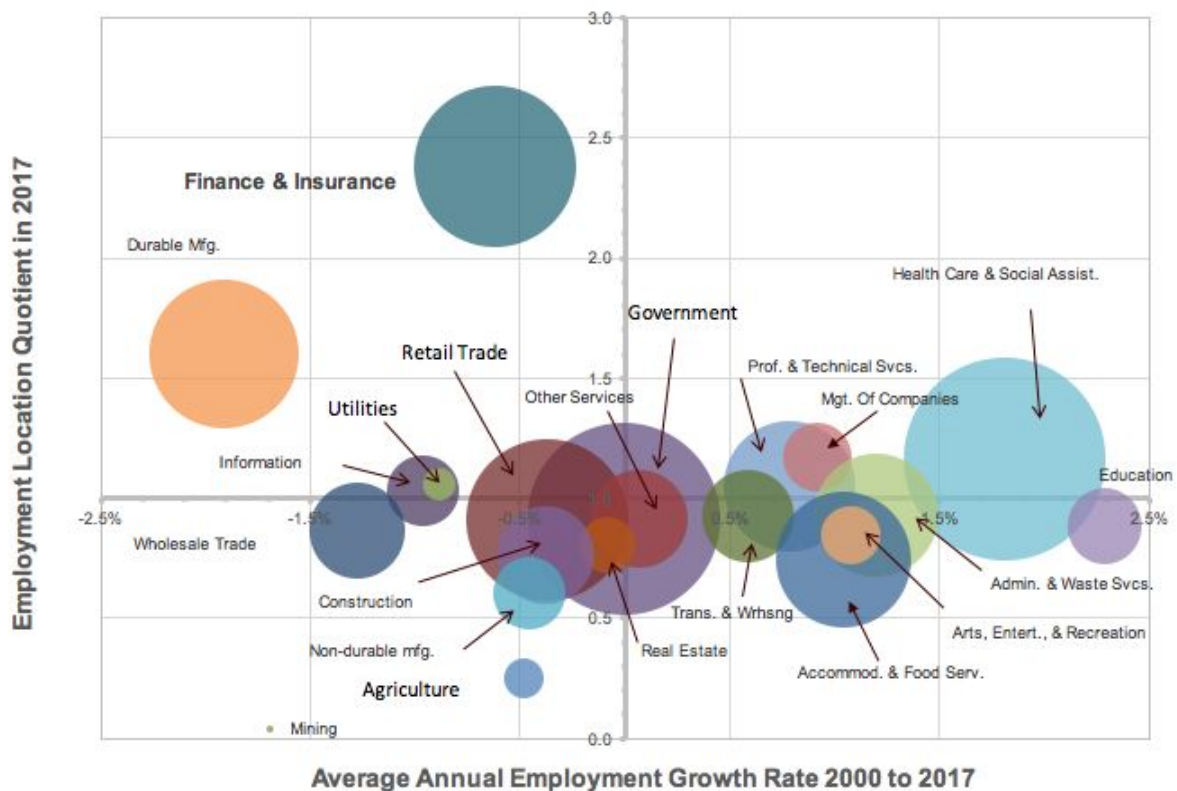
Hartford's role as a state capital is also an asset to the region. The activity generated by state government has been a long-term benefit to the region's economy. State government activities

provide a large and predictable base of employment, wages, and purchases of goods and services. On the other hand, the State of Connecticut's challenging fiscal situation limits the ability statewide to increase the state economic competitiveness through a combination of reducing business taxes and offering economic incentives, whether in the form of tax credits or abatement, grants, low interest loans, and in-kind services.

Target Sectors

To identify target sectors, a shift-share analysis was performed for the MSA, analyzing performance by NAICS sectors from 2000 to 2017. Sectors were classified into High Performing, Emerging, Legacy, and Laggard based on employment growth, size, location quotient, and US growth of each sector. This information is displayed in two different ways in the charts below: first on an employment basis, and then on an output basis.

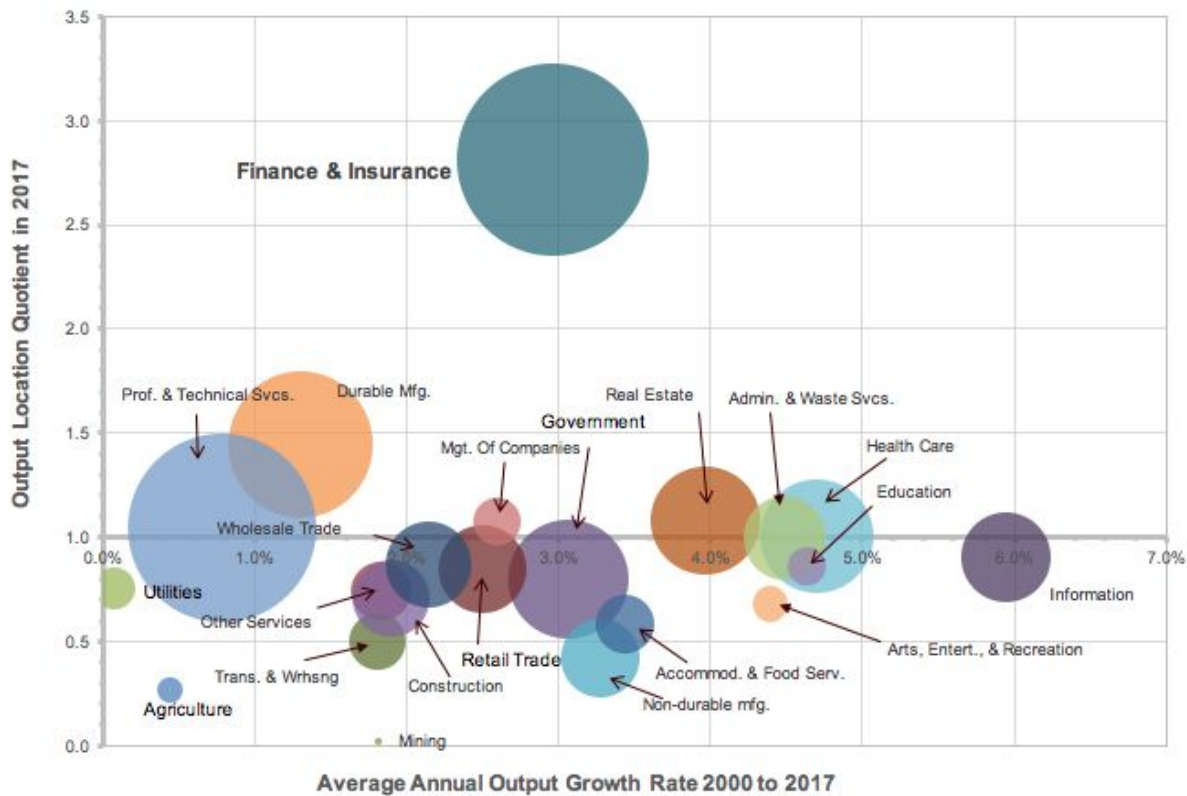
*Historical Change in the Performance and Structure of the Hartford MSA's Economy by Major Sector **based on Employment***



Source: IHS Economics, 2018. Business Markets Insights database. Bubble size is sector employment in 2017

Industries that appear larger on the previous chart have more total employment. Manufacturing, Finance and Insurance, Health Care & Social Assistance, and Government are the largest. Those that appear larger on the second chart are greater in output. So, the Professional, Scientific, and Technical Services sector (which includes a variety of “white-collar” work, e.g., accounting or engineering firms) has relatively little employment compared to its relatively significant economic output. The opposite is true for the Retail sector. In both charts, the x-axes measure the rate of growth—in employment and output, respectively—and the y-axis measure the location quotient, i.e., extent to which a certain industry’s concentration exceeds the average. Finance and Insurance sector businesses are by far Metro Hartford’s most significant industry by concentration. Durable Manufacturing, which has declined in recent years both in Metro Hartford and throughout the country, has the second highest location quotient. Both of these industries have lost workforce in recent years.

Historical Change in the Performance and Structure of the Hartford MSA’s Economy by Major Sector based on Output



Source: IHS Economics, 2018. Business Markets Insights database. Bubble size is sector output (millions of \$) in 2017

Beyond industry-level analysis, it is important to understand where specific opportunities for growth lie. The following analysis defines clusters and sub-clusters as used in the US Cluster Mapping Project (i.e., Porter Clusters), with four-digit NAICS codes mapped to cluster definitions (The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments). Traded and local clusters were differentiated, and advanced sectors were identified. Finally, forecasted output growth was assessed to compare performance in each sector to the level of growth expected moving forward.

The targeted sectors for Metro Hartford are listed below (along with NAICS codes):

- **Business Services**
 - Sub-sectors: Data Processing (5182), Architectural & Engineering (5413), Computer Systems Design (5415), Management Consulting (5416), Management of Companies (5511), Employment Services (5613)
 - Large Legacy Legal Services sector (5411)
 - Business services supports and enhances growth in other sectors – Finance, Insurance, Health Care
 - Benefits from region's cost advantages, proximity to large NE US market
- **Insurance and other Financial**
 - Sub-sector: Insurance Services (5241), Other Financial Services (5329)
 - Region still has a competitive advantage for this sector – critical to maintain it
 - Insurance services creates demand for a variety of business services, and workers in financial occupations
- **Metal Working and Metal Products (upstream and downstream)**
 - Sub-sectors: Forging and Stamping (3321), Cutlery and Hand Tools (3322), Architectural and Structural Metals (3323), Hardware (3325) Machine Shops (3327), Other Fabricated Metal Products (3329).
 - Large laggard Wholesale trade sectors – hardware, electrical goods, and Misc. Durable goods
- **Printing Services**
 - Subsector: Support Activities – printing (3231)
 - Creates demand for Chemical Products
 - Supports Business Services
- **Production Technology Machinery and Equipment**
 - Subsectors: Industrial machinery (3332), Metalworking Machinery (3335), Electric Lighting Equip. (3351), Other Machinery (3339), Other Electrical Equipment and Computers (3359)
 - Electronic Instruments (3345) Large laggard sector – demand from Aerospace
 - Legacy of Region's aerospace history, major supplier to it

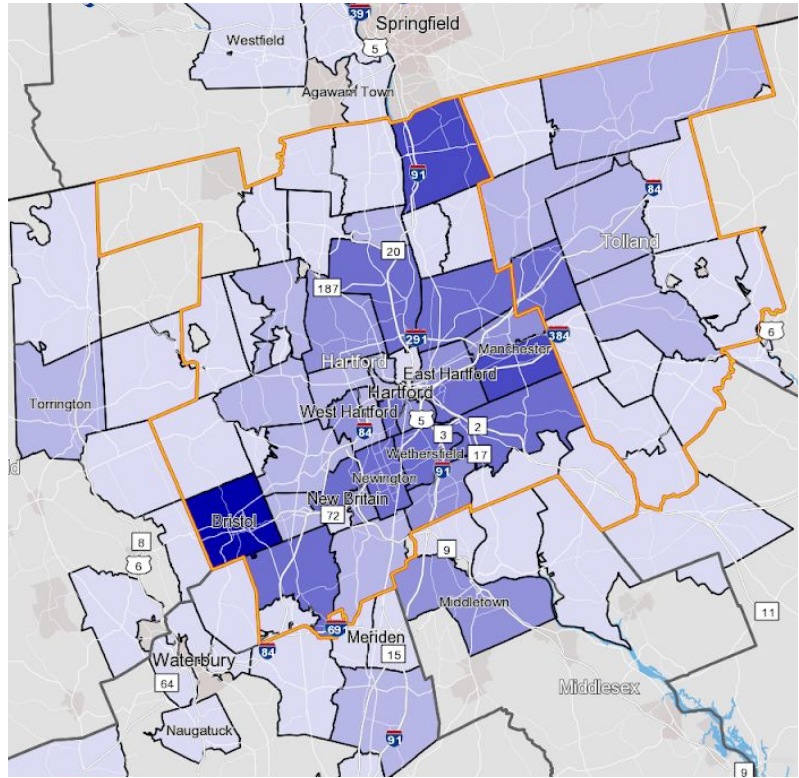
- **Aerospace**
 - Sub-sector: Aerospace products and parts (3364), Legacy sector, still a major presence.
 - Source of demand for machinery and metals products
 - Challenge will be supply of skilled workers
- **Medical Devices**
 - Subsectors: Commercial and service industrial machinery (3333), Medical Devices (3339)
 - Serve large NE US health care sector, health insurance providers.
 - Region has small Pharmaceutical sector (3254), could benefit from other, but located to major pharma clusters in other NE metros

The clusters identified show that the region has a concentration of activity in advanced manufacturing sectors that produce a range of complex, high-value added durable mfg. goods such as machinery, electrical equipment, electronics, tools, aerospace, transportation equipment, etc. This cluster exists, and continues to perform well, because of the legacy of producing these types goods due to such companies as Pratt and Whitney. Targeted workforce training programs should continue and be enhanced as necessary to train workers in key occupations required by these companies.

A Regional Workforce

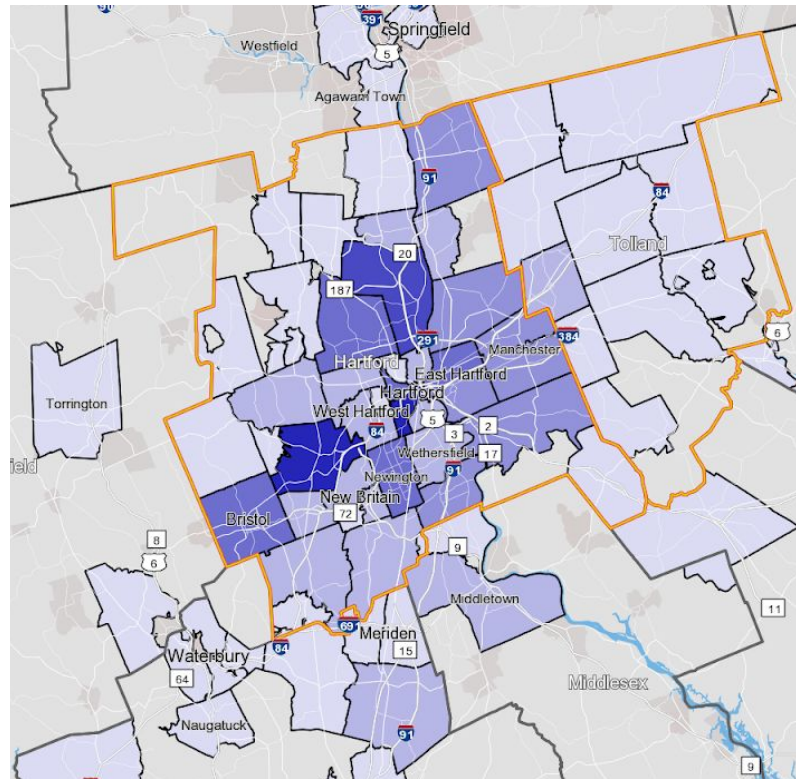
Where Workers Are

The map shown in the upper right illustrates where workers who hold jobs in the Hartford region live, with darker purple signifying a higher concentration of workers. Although the greatest concentrations of workers lie in the Southwest, East, and Northeast of Hartford County, many workers in the region reside in the less dense Tolland County. Overall, workers are coming from throughout the region.



Where Jobs Are

The map in the lower right shows the locations of jobs are held by workers who live in the Hartford region. Most jobs are clustered around the center of Hartford County, although there are many significant employment hubs throughout the region. Some additional clustering exists along the corridor from New Britain to Springfield.



The dynamic between where jobs are held and where workers live illustrates that Tolland County depends on Hartford County for its jobs, while Hartford County depends on Tolland County for its workforce, and the region is highly interconnected through the links between employees and jobs.

Source: *Census OnTheMap*

Table: Population Change by Town in Region

Town	County	Population 2000	Population 2010	Population 2017	Population Change 2000-2010	Population Change 2010-2017
Avon	Hartford	15802	18098	18352	14.5%	1.4%
Berlin	Hartford	18273	19866	20505	8.7%	3.2%
Bloomfield	Hartford	19614	20486	21406	4.4%	4.5%
Canton	Hartford	8882	10292	10298	15.9%	0.1%
East Granby	Hartford	4763	5148	5166	8.1%	0.3%
East Hartford	Hartford	49643	51252	50319	3.2%	-1.8%
East Windsor	Hartford	9855	11162	11395	13.3%	2.1%
Enfield	Hartford	45211	44654	44585	-1.2%	-0.2%
Farmington	Hartford	23788	25340	25572	6.5%	0.9%
Glastonbury	Hartford	31953	34427	34575	7.7%	0.4%
Granby	Hartford	10366	11282	11357	8.8%	0.7%
Hartford	Hartford	124225	124775	123400	0.4%	-1.1%
Manchester	Hartford	54760	58241	57932	6.4%	-0.5%
Marlborough	Hartford	5729	6404	6397	11.8%	-0.1%
New Britain	Hartford	71579	73206	72710	2.3%	-0.7%
Newington	Hartford	29358	30562	30404	4.1%	-0.5%
Plainville	Hartford	17218	17716	17705	2.9%	-0.1%
Rocky Hill	Hartford	18026	19709	20105	9.3%	2.0%
Simsbury	Hartford	23253	23511	24952	1.1%	6.1%
Southington	Hartford	39819	43069	43863	8.2%	1.8%

Table Continued on following page...

Town	County	Population 2000	Population 2010	Population 2017	Population Change 2000-2010	Population Change 2010-2017
South Windsor	Hartford	24453	25709	25937	5.10%	0.90%
Suffield	Hartford	13605	15735	15698	15.70%	-0.20%
West Hartford	Hartford	61122	63268	63133	3.50%	-0.20%
Wethersfield	Hartford	26266	26668	26195	1.50%	-1.80%
Windsor	Hartford	28302	29044	28898	2.60%	-0.50%
Windsor Locks	Hartford	12060	12498	12554	3.60%	0.40%
Andover	Tolland	3032	3303	3248	8.90%	-1.70%
Bolton	Tolland	5026	4980	4916	-0.90%	-1.30%
Columbia	Tolland	4987	5485	5418	10.00%	-1.20%
Coventry	Tolland	11543	12435	12439	7.70%	0.00%
Ellington	Tolland	13008	15602	16195	19.90%	3.80%
Hebron	Tolland	8665	9686	9507	11.80%	-1.80%
Mansfield	Tolland	20871	26543	25912	27.20%	-2.40%
Somers	Tolland	10424	11444	11106	9.80%	-3.00%
Stafford	Tolland	11345	12087	11949	6.50%	-1.10%
Tolland	Tolland	13147	15052	14722	14.50%	-2.20%
Vernon	Tolland	28155	29179	29289	3.60%	0.40%
Willington	Tolland	5963	6041	5921	1.30%	-2.00%
Region	-	924,091	973,959	974,035	5.40%	0.00%
MSA	-	1,1508,72	1,212,381	1,210,259	5.30%	-0.20%

2. SWOT Analysis

SWOT Analysis for Comprehensive Economic Development Strategy for the Capital Region Council of Governments

Thursday, May 17, 2018

ECONOMIC SETTING

The Capitol Region Council of Governments (CROG) is comprised of 38 cities and towns located in Hartford and Tolland Counties in Connecticut. These two counties, plus Middlesex, make up the Hartford-West Hartford-East Hartford Metropolitan Statistical Area (MSA). The analysis below presents a strengths, weaknesses, opportunities, and targets (SWOT) analysis of the CROG Region (the Region) of its economic development context, with a specific focus on the Region's competitive advantages and disadvantages for the sectors that were identified during the initial phase of the CEDs planning process. The primary level of analysis for the SWOT is the Hartford MSA as the most detailed and current information is available at this level than for individual counties. Data for the MSA is very representative of the two-county Region because they accounted for between 85% and 90% of total economic activity and population in the MSA in 2017.

Table 1 in the Appendix compares the recent economic performance of the two-county Region to that of the State of Connecticut for a set of major economic and demographic variables. It shows that the Region accounted for between 30 to 35% of the total statewide economy in 2017 based its shares of employment and Gross State Product in 2017, although its share of total CT personal income was substantially lower at just 25%. The levels of per capita income, wages, and productivity (e.g., Gross Regional Product per worker) are also lower than the statewide figures, primarily because of the high levels of economic activity in Fairfield County. The table also shows that average annual growth rates for most of the variables were slightly above the statewide rates over the analysis period.

The change in the performance and structure of Hartford MSA economy is presented in Charts 1 and 2 of the Appendix. Each chart shows the annual growth rates along the X axis, the location quotients in 2017 along the y or vertical axis, with the size of each bubble showing the size of the sector in 2017. Chart 1 shows the changes in structure based on employment while Chart 2 shows the changes based on output. Because productivity levels, or output per worker, vary widely across major economic sectors, it is necessary to consider both employment and output when examining performance levels by major sector, and changes in structure over time. Sectors with high productivity make larger contributions to a region's economy than their employment totals would indicate, and vice versa. This is especially true in the CROG Region where finance and insurance services account for large shares of economic activity.

STRENGTHS

- A relatively large, diverse, regional economy. As shown in Table 1 in the Appendix, total employment in 2017 was approximately 567,800 jobs in the two CROG counties, compared to 638,600 in the MSA. An IHS analysis of the Shannon-Weaver index of structure diversity yielded a value of .81 for the MSA in 2017, the same as the figure across all MSAs. The higher the value, the greater the diversity in a regional economy, and the more closely its distribution of employment by sector matches that of the US economy.
- Above-average shares of economic activity in all advanced sectors, including advanced manufacturing. Approximately 14.2% of total MSA employment in 2017 was in advanced

sectors, well above the US share of 11.1%. Similarly, 56% of total Mfg. employment was in advanced sectors; again well above the US share of 46.3%. Six sectors account for 80% of advanced mfg. employment.

- Relatively lower wage costs by sector and occupation when compared to other large MSAs on the Northeast. Table 2 of Appendix presents a wage comparison by major economic sector, while Table 3 presents wage levels and growth rates. Table 2 shows that in 2016 wage levels in the Hartford MSA were generally lower than in CT or MA, but higher than in RI. BLS's national QCEW data base did not publish wages for the Hartford MSA's manufacturing sector in 2016, but an analysis of wage data published by Connecticut Department of Labor confirms that level of wages in manufacturing are also generally lower than those in CT and MA. Site selectors consistently rank the cost and availability of labor as the most important criterion in attracting new companies, so the Hartford MSA's lower than average wage levels are a significant regional competitive advantage, especially when competing with the Boston and New York s MSAs. As noted below, along with its lower wage levels the Hartford MSA has also has lower costs of living and more affordable housing.
- Lower cost of doing business relative to other large metro regions in New England and Middle Atlantic. IHS Markit's Cost of Doing Business index (All MSA level = 100.0) in 2017 had the following values: :
 - Office Index: 101.4, compared to 111 in New Haven, 130.3 in New York, 114.6 in Boston, and 99.6 in Providence
 - Mfg. Index: 108.1, compared to 117.2 in New Haven, 123.6 in New York, 123.6 in Boston, and 109.8 in Providence
- Consistent with the IHS Markit rankings, KPMG's Competitive Alternatives Study in 2016 also showed that the Hartford MSA had a lower cost of doing business compared to most other metro areas in the Northeast. With the Average for all US MSAs = 100, Hartford's overall index value was 98.2 vs. 104.7 in New York and 101.2 in Boston, but again slightly higher than 96.7 in Providence
- Competitive Cost of Living. Regional purchasing parity index in 2017 in Hartford MSA was 1.13 lower than 1.24 in New Haven, 136 in New York, and 123 in Boston; but slightly above 1.11 in Providence.
- A lower cost and affordable housing stock. The average price of an existing, single family home in the Hartford MSA in 2017 was \$259,300, 26.5% below the Connecticut figure of \$353,500. IHS Markit's housing affordability index estimates the price of an existing single family home that can be purchased by the median-income family assuming standard mortgage lending criteria. A higher price indicates a more affordable housing stock and vice versa. The housing affordability index value for the Hartford MSA in 2017 was \$186,900, well above the figure of \$173,000 for CT.
- Strategic Location in the center of the large market of the Northeast US. The Boston and New York MSAs are located within drives of under 2-hours or less. The total population in 2015 within a 50-mile radius of downtown Hartford was 4 million persons, with 44.4

million living within a 200-mile radius so a very large market can be served by businesses located in the Region.

- Above average share of foreign exports. In 2016 the value of merchandise exports made in the Hartford MSA was \$10.4 billion, comprising 11.1% of its Gross Metro Product. This share ranked 3rd out of 21 MSAs with a total employment between 500,000 and 1 million jobs in 2016, so Hartford's export share is well above the average for comparably-sized MSAs. The median share for MSAs in this employment size range was 7.1%, while it was 5.8% for MSAs with employment of least 1 million. As with goods and services made in the MSA that are sold elsewhere in the US, foreign exports also bring income back into the MSA's economy. Research has shown that companies that export to foreign countries become more efficient because of their need to compete in the global market.
- Substantial number of foreign owned companies. The MSA has long been, and continues to be, a desirable location for foreign-owned advanced manufacturing companies that make complex components used in the Connecticut's transportation equipment sector, especially aerospace, and in machinery and equipment production. Combining information provided by the Metro Hartford Alliance with analysis by IHS Markit, a total of 86 foreign-owned companies were identified in the Hartford MSA; 78 of which are in Hartford County. This number is likely larger, especially for small to medium enterprises (SMEs) given the challenges of identifying foreign owned companies using corporate registration data.
- Highly educated labor force; which results in higher worker productivity and is a primary site selection factor for attracting companies. The MSA has above-average levels of educational attainment; in 2016 33.2% of the population 25 years and older had a Bachelor's degree or higher, compared to 31.3% in the US and 38.6% in Connecticut. The share with an advanced degree was 16.1% in the Hartford MSA, 11.9% in the US and 16.7% in CT.
- The presence of the State Capitol in Hartford. The activity generated by state government has been a long-term benefit to the Region's economy as it provides a large stable base of employment, wages, and purchases of goods and services. State governments provide stability to a regional economy as they are not influenced by fluctuations in the US business cycle. While they do not have very high levels of growth over time, neither do they experience sharp declines during recessions. However, as Connecticut continues to face substantial fiscal problems that have limited the growth in spending and employment, the State Government's contribution to growth rates in the Hartford MSA has declined.
- Above-average concentration of skilled workers. Occupational employment concentrations in the MSA were determined for four custom aggregations that are required by technology-based industries: Science, Technology, Engineering, and Math (STEM); Information Technology (IT); Business Services, and High Technology. Each aggregation's share of total MSA employment in 2017 was higher than in CT or US (i.e., their employment location quotients (LQs) were > 1.0.
- A large higher education sector. There are 17 post-secondary institutions that have been accredited by the Carnegie Commission. During the 2016-17 school year they had a total

full time equivalent enrollment of just over 79,000 students and awarded almost 39,300 certificates and degrees at all levels, 79% of which were Bachelor's degrees or higher. Two schools – the University of Connecticut and Central Connecticut State University – accounted for 50% of the enrollment and awarded 54% of the certificates and degrees during the 2016-17 academic year.

- The University of Connecticut is classified by the Carnegie Commission as Doctoral Universities: Highest Research Activity, indicating that it is a major economic development asset, but who's potential to spur innovation in the MSA has not been fully utilized.
- In the Hartford MSA demographic and socioeconomic indicators that address inequality and resiliency are comparable to those for CT and the US. This differs from the situation in a number of mid-size metro areas in the Northeast and Midwest that historically had large manufacturing sectors, and that now have above-average concentrations of low income residents that a concentrated in small areas. In sum, the Hartford MSA does not have an above-average concentration of low income residents when compared to the US and Connecticut. For example:
 - According to the American Community Survey (ACS), in 2016 the number of persons living in poverty in the Hartford MSA was 10.1%, below the US figure of 14%, and slightly above the CT level of 9.8%.
 - The Gini coefficient measures the distribution of household income inequality; the closer the value is to 1.0, the more equal the income distribution. According to the ACS, in 2016 the Gini coefficient for the Hartford MSA was .4648 compared to the US level of 0.4804, suggesting a slightly higher level of income inequality in the MSA.
 - The dependency ratio is the ratio of the dependent population, defined as children 14 years and under plus persons 65 years and older, over the working age population from 15 to 64. A lower ratio is preferred as it indicates that there are fewer dependent persons per each working-age person. In 2016 the Hartford MSA's dependency ratio was 0.493 compared to the US figure of 0.507. Levels in other CT metros were Bridgeport - 0.504 and New Haven - 0.492.
 - Within the MSA there are concentrations of low-income residents, especially in census tracts located within a 2-mile radius of Rentschler Field.
- Stable labor market. The unemployment rate, not seasonally adjusted, in the Hartford MSA was generally about 0.3 to 0.4 percentage points above the statewide rate before the Great Recession. Over the last five years, the unemployment rate in the MSA has been very slightly above the Connecticut level, but the difference is not significant. Finally, over the last five years the unemployment rates in both the Hartford MSA and Connecticut have ranged between 0.3 and 0.4 percentage points above the US rate.

WEAKNESSES

- Moderate economic growth. Between 2000 and 2017 total employment in the Hartford MSA was virtually unchanged, while real Gross Metro Product grew at an average annual rate of 0.6%. The average annual employment growth in the CROG region has been

slightly higher than for CT in most sectors, but below the US. However, annual growth rates for total personal income, per capita personal income, and gross regional product have been slightly below the statewide rates, and further below the US rates. One concern is that the MSA's per capita personal income in 2017 was only 84% of the statewide level.

- Unfavorable economic structure. Growth in the MSA has been constrained because it has had above-average shares of economic activity in low performing sectors. We conducted a shift-share analysis of employment growth by 4-digit NAICs sector between 2000 and 2017 that we also used to identify the target clusters. It showed that almost 71% of total employment in 2017 was in Legacy and Laggard sectors, versus only 29% in High Performing and Emerging sectors, with only 8% in the latter. The low Emerging share is a concern because it indicates a lack dynamism in the MSA's economy as there are relatively few high-growth, emerging companies and sectors.
- High business tax rates. The Tax Foundation's 2018 State Business Tax Climate index ranked CT 44th with an index of 4.32 (a higher index value is better as it means lower business tax rates), compared to 3.6 and a rank of 49th in New York; and 4.45 and a rank of 41st in Rhode Island. By contrast, Massachusetts had a more favorable business tax climate with an index of 5.2 and a rank of 22nd. CT was highest for sales taxes – rank of 27th and corporate income tax – rank of 31st; and lowest for property taxes – rank of 49th.
- High property tax rates and a heavy reliance on the real property tax as a revenue source. CT municipalities have some of highest effective real property tax rates of any state in the US, and are more dependent on them as revenues sources than local governments in most other states. Current 2018 fiscal year property tax equalized millage rates are similar across most of the cities and towns in Hartford and Tolland Counties with a median rate of 32.5 mills (i.e., a tax rate of \$32.50 per \$1,000 of equalized value). However, the rate in Hartford is 74.29 mills, followed by 50.5 in New Britain and 47.05 in East Hartford
- The State of Connecticut's challenging fiscal situation will continue to limit its ability to increase the state economic competitiveness through a combination of reducing business taxes and offering economic incentives, whether in the form of tax credits or abatement, grants, low interest loans and in-kind services. As the Connecticut Commission on Fiscal Stability and Economic Growth noted in their final report released in March 2018"

"Fiscal Stability: Connecticut's fiscal stability has deteriorated to crisis levels, eroding general public and business confidence. Fiscal stability is a condition precedent to competitiveness. State expenditures have been growing at a rate exceeding revenue growth since the Great Recession. At the same time, ballooning fixed costs related to rising debt and unfunded liability levels have crowded out infrastructure investments and discretionary spending line items for education, transportation, aid for the vulnerable, and other important government services and programs."

Because of the State's inability to provide substantial resources to support economic development to organizations within the CROG region, local organizations will have to assume a larger share of the cost of implementing economic development programs.

- Our analysis of employment by occupation by race showed that Black, Non-white Hispanic, and other Non-Asian minority residents are over-concentrated in low paying occupations and under-represented in high paying ones. This unequal distribution is fairly common in MSAs, especially older ones where the manufacturing sector has declined.

Opportunities

- Take advantage of the locational benefits of the CROG region's proximity to, and position between, the New York and Boston metro areas. The Region is located within a 2-hour drive of both areas so that goods and services used there can be easily provided to customers in the two metros.
- Quicker rail commuting service between Hartford and New York is scheduled to begin in June of 2018. The service should be prioritized and expanded upon with a connection to Boston. While it will make it easier for residents of the CROG region to commute to jobs in New York, it will enable them to remain as residents of the Region to take advantage of its lower costs of housing and living. Employees of companies in the CROG will also be able to travel more quickly to same-day business meetings in New York. Finally, it will make it easier for workers in New York and southwestern Connecticut to travel to jobs in Hartford.
- Take advantage of the presence of large corporate headquarters to participate or fund economic development activities and participated in attraction efforts, especially above average share of Fortune 1000 companies. There were 28 companies on the 2017 Fortune 1000 list located in Connecticut, with six in the Hartford MSA: Aetna (43), Cigna (67), Kaman (970), Stanley Black and Decker (250), The Hartford (152), and United Technologies (52). Hartford's total of six was tied for a rank of 35th among the 131 MSAs that had at least one Fortune 1000 firm in 2017; the was the same number as in the much large MSAs of Memphis, San Antonio, San Diego, and Tampa. The MSA is also home to the HQs of many smaller companies; an analysis using the Hoover's data base identified 700 companies, with annual sales of at least \$5 million, with an HQ in the MSA.
- The Region should also take advantage of its lower costs of doing businesses, and living, compared to other Northeast metros, specifically Boston and New York. The cost advantages make it especially attractive for business service, IT support, information processing and analytics, and digital design activities where transportation cost is not an issue. The lower cost of office and warehousing space, especially in Hartford, are attractive to these types of service providers, as well as for other types of services such as design centers for Architectural and Engineering firms. The presence of State Government has likely been a factor in attracting A&E firms, along with proximity to Boston and New York, and the presence of large clients such as United Technologies.
- The Region's combination of excellent highway and rail access, relatively lower costs of doing business, including land and building costs, and location in the middle of the large Northeast market make it potentially suitable as location for warehousing and distribution facilities, especially those handling high value, complex manufacturing goods.

- The large number of graduates from the MSA’s college and universities is major opportunity to annual increase the quality of the workforce – if substantial numbers of them remain in the region. Their decisions to remain here, instead of moving to Boston or New York will depend on the availability of well-paying jobs, affordable rental housing, low cost of living, and quality of life.
- The clusters we identified show that the Region has a concentration of activity in advanced manufacturing sectors that produce a range of complex, high-value added durable mfg. goods such as machinery, electrical equipment, electronics, tools, aerospace, transportation equipment, etc. This cluster exists, and continues to perform well, because of the legacy of producing these types of goods due to such companies as Pratt and Whitney. Targeted workforce training programs should continue, and be enhanced as necessary to train workers in key occupations required by these companies.
- STEM occupations accounted for 7.2% of total occupational employment in 2016, compared to 6.7% in CT and 6.2% in US. The region needs to consider how to leverage these skills to attract new industries in the advanced manufacturing cluster.
- There is a substantial amount of demographic and socioeconomic diversity among the residents of the CROG region, with higher shares of low income residents living within several miles of downtown Hartford. The opportunity exists to increase diversity in the workforce through targeted workforce development programs, and the provision of local area transportation services that enables low-income residents to travel to jobs.
- The CROG Region is well suited to attracting foreign owned companies looking to enter the US market, especially those producing complex, high-value added manufacturing goods that require skilled workers, or offer IT services. The Region’s lower costs of doing business and living, and its proximity to Boston and New York, enables foreign-owned firms to minimize their initial risk of establishing operations here, while having ready access to the large Northeastern market. These firms are often looking to establish partnerships or joint ventures with US firms, or identify qualified suppliers. State and regional economic development officials should continue to provide these services.
- Economic development policies and job training programs should be directed at reducing the inequities in the labor force where non-Asian minority residents are over concentrated in low paying occupations and under-represented in high paying ones. Programs should provide these residents either with skills to obtain entry level jobs in high paying occupations, or to obtain higher paying positions within their current. Another way to reduce these inequities is to help minority college graduates find positions with local firms, especially graduates in the STEM fields.
- While the University of Connecticut is classified as Doctoral Universities: Highest Research Activity, its economic development potential appears not to have been fully utilized. For a university of its size (e.g., budget, enrollment, and totals awards) it spends relatively little on R&D, in part because its historic mission was different. The University, in cooperation with private companies in R&D intensive sectors and state and local economic development organizations, should seek opportunities to attract more R&D spending. These efforts should be directed toward attracting applied research as it is more likely to

attract corporate participation, which can lead to quicker commercialization of new technologies and spinning off of startups.

- Qualified small businesses in manufacturing, working with economic development organizations, should increase efforts to obtain grants from the Federal Government's Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. The region's above average concentration of employment and output in advanced manufacturing sectors suggests that it could be very competitive for these grants.
- IHS Markit has identified a set of eight target clusters that the CROG Region is well suited for, and toward which economic development resources should be targeted to maintain and enhance the economic performance. The characteristics of the clusters are presented in the accompanying table; they include traditionally important industries (e.g., insurance, aerospace, metal working) and those that could become increasingly more important (e.g., business services, production technology, and communications equipment). The focus of the cluster analysis was on identifying tradable sectors that bring income back into the region.
- There are some significant clusters like Healthcare that provide over 80,000 jobs that also have some tradability (i.e., its employment location quotient 2017 was 1.12). However, the performance of individual healthcare sub-sectors varied widely (i.e., general medical and surgical hospitals performed poorly, while psychiatric hospitals ones and offices of physicians did well). The demand for health care services will still come primarily within the region. Selective targets of opportunity with Healthcare should be pursued, especially as they involve providing business and IT services to firms like Aetna and Cigna.

Target Clusters

Presented in descending order of cluster suitability, data and analysis is for the Hartford-West Hartford-East Hartford Metropolitan Statistical Area

Business Services Cluster						
Sub-sectors	2017 Employ.	2017 Employ. LQ	2017 Output per worker	Shift-share Type	Tradable	Advanced Sector?
Data Processing (NAICS 5182)	2,190	1.38	\$ 492,889	Legacy	Yes - 2	Yes
Arch. & Engineering (NAICS 5413)	7,323	1.18	\$ 278,424	High Performing	Yes - 2	Yes
Computer System Design (NAICS 5415)	11,865	1.36	\$ 312,719	Legacy	Yes - 2	Yes
Mgmt. Consulting (NAICS 5416)	5,703	0.92	\$ 218,143	Emerging	Yes - 2	Yes
Mgmt. of Companies (NAICS 5511)	10,080	1.04	\$ 234,778	Legacy	Yes - 2	Yes
Cluster total	37,161	1.17	\$ 280,923			
Insurance Services Cluster						
Sub-sectors	2017 Employment	2017 Employ. LQ	2017 Output per worker	Shift-share Type	Tradable	Advanced Sector?
Insurance Services (NAICS 5241)	40,885	6.52	\$ 654,242	Legacy	Yes -2	No
Other Financial Services (NAICS 5239)	4,133	2.31	\$ 670,057	High Performing	Yes -2	No
Cluster total	45,018	6.13	\$ 655,694			
Metal Working and Products Cluster						
Sub-sectors	2017 Employment	2017 Employ. LQ	2017 Output per worker	Shift-share Type	Tradable	Advanced Sector?
Forging and Stamping (NAICS 3321)	1,987	4.13	\$ 283,908	High Performing	Yes - 3	No
Cutlery and Hand Tools (NAICS 3322)	845	5.31	\$ 285,200	High Performing	Yes - 3	No
Architect. & Structural Metals (NAICS 3323)	1,548	1.01	\$ 284,168	High Performing	Yes - 3	No
Hardware (NAICS 3325)	705	6.00	\$ 285,125	High Performing	Yes - 3	No
Machine Shops (NAICS 3327)	5,074	3.20	\$ 284,821	Legacy	Yes - 2	No
Other Fab. Metals Products (NAICS 3329)	4,690	4.24	\$ 282,208	High Performing	Yes - 3	No
Cluster total	14,849	3.68	\$ 283,842			
Aerospace Cluster						
Sub-sectors	2017 Employment	2017 Employ. LQ	2017 Output per worker	Shift-share Type	Tradable	Advanced Sector?
Aerospace Products & Parts (NAICS 3364)	20,735	8.97	\$ 474,080	Legacy	Yes -3	Yes
Production Technology, Machinery and Equip. Cluster						
Sub-sectors	2017 Employment	2017 Employ. LQ	2017 Output per worker	Shift-share Type	Tradable	Advanced Sector?
Industrial Machinery (NAICS 3332)	1,031	2.01	\$ 318,525	Legacy	Yes -3	Yes
Metalworking Machinery (NAICS 3335)	2,920	3.91	\$ 190,992	High Performing	Yes -3	No
Electric Lighting Equip.(NAICS 3351)	557	2.75	\$ 298,937	High Performing	Yes -3	Yes
Other Machinery (NAICS 3339)	1,956	1.72	\$ 591,952	High Performing	Yes -3	Yes
Other Elec. Equip. & Computers (NACs 3359)	2,258	4.01	\$ 465,947	High Performing	Yes -3	Yes
Cluster total	8,722	3.15	\$ 374,062			
Printing Services Cluster						
Sub-sectors	2017 Employment	2017 Employ. LQ	2017 Output per worker	Shift-share Type	Tradable	Advanced Sector?
Support Activities for Printing (NAICS 3231)	6,167	3.28	\$ 232,727	High Performing	Yes -2	No
Medical Device Cluster						
Sub-sectors	2017 Employment	2017 Employ. LQ	2017 Output per worker	Shift-share Type	Tradable	Advanced Sector?
Comm. & Service Machinery (NAICS 3333)	775	2.02	\$ 318,525	High Performing	Yes -3	Yes
Medical Equip. & Supplies Mfg. (NAICS 3391)	416	0.32	\$ 310,459	Emerging	Yes -3	Yes
Cluster total	1,191	1.43	\$ 315,708			
Communications Equipment Cluster						
Sub-sectors	2017 Employment	2017 Employ. LQ	2017 Output per worker	Shift-share Type	Tradable	Advanced Sector?
Communications Equip. Mfg. (NAICS 3342)	591	1.56	\$ 464,740	High Performing	Yes -3	Yes
Cable & Subscript. Program NAICS 5152)	2,216	11.55	\$ 901,262	High Performing	Yes - 2	Yes
Cluster total	2,807	9.45	\$ 809,354			

Threats

- The Region’s economic performance from 2000 to 2017 trailed the US economy, but slightly out-performed CT in some areas, and trailed it in others, notably growth rates for total personal and per capita personal incomes, number of households, and Gross Regional Product. The MSA’s current below-average wage levels are a competitive advantage, and if wage rates continue to grow more slowly than at the state level as we forecast, this advantage will be maintained. The downside of slow wage rate growth is that the amount of income received by residents of MSA will also rise slowly, and wages in some sectors may not be high enough to attract skilled workers.
- IHS Markit forecasts that the economic growth rates in both Connecticut and the Hartford MSA over the next 10 years will continue to lag that of US, which will constrain the amount of new development that will occur in the CROG region as personal consumption spending, or region demand generated by households, will also grow slowly.
- The rate of new business entity formation has trailed the state, but the level of new businesses entities was up in 2017 compared to the annual average between 2000 and 2017. An overwhelming majority of firms are over 11 years old. New businesses make up just 2% of employment. Thinking about policies to encourage new business creation may be a way to help revive the economy and help bolster economic resilience with new sources of value creation.
- Continuing fiscal challenges for the State of Connecticut which will limit its ability to spend funds for government programs and services, including economic development, and being able to offer economic incentives. Implementing the recommendations of the Connecticut Commission on Fiscal Stability and Economic Growth will improve the State’s economic competitiveness and provide future resources for economic development activities.
- Downtown Hartford lacks the amenities and quality of life that are required to retain college graduates, and more importantly to attract skilled technology workers in their 20s and 30s who increasingly prefer to live in center cities. If the quality of life in downtown Hartford continues to lag, it will be difficult to attract workers to live there whose education and skills will be required by the clusters we have identified.
- Continued inability to retain college students in the MSA after they graduate. A 2016 study by the Brookings Institute ranked the Hartford MSA as among the 10 worst in retaining graduates of two-year and four-year institutions. This is due in large part to its proximity to Boston and New York. More needs to be done to retain college graduates, including providing internships with local companies while they are in school, and making them aware of openings at local firm as they approach graduation. The corporate community needs to make a concerted effort to hire qualified graduates. It would also be helpful to make graduates aware of affordable, suitable housing in the Region.
- The ability to retain college graduates will depend primarily on the availability of well-paying jobs, but also on maintaining the relatively low costs of living and housing, and increasing the quality of life in downtown Hartford. Table 2 of the Appendix shows that wage levels for several of the private, services-providing sectors where college graduates are likely to be hired are substantially below the Connecticut levels (e.g.,

Professional and Business Services, Financial Activities), while those in Information are only slightly below. One reason for the difference is that statewide average levels are affected by the high wages paid in Fairfield County. Salaries offered to recent college graduates will likely need to be higher in entry level positions in these two sectors to attract new college graduates.

- Another threat is the continued out-migration of persons in the prime working age cohorts. The share of total population for persons between the ages of 25 and 44 has steadily declined for years, falling from 33.4% in 1990 to the current level of 23.8%, with an absolute decline of 87,200 persons.
- Table 4 in the Appendix presents IHS Markit’s April 2018 alternative economic forecasts for the Hartford MSA, along with our baseline or most likely forecast. The alternative forecasts are based primarily on different assumptions about conditions in the US economy.

Appendices

Table 1: Historic Performance of the CROG Region vs. Connecticut for Major Demographic and Economic Variables

Variable	2017 Value	% of CT	Avg. Annual Growth Rate 2000-2017	CROG growth rate > CT rate
Total Nonfarm employment	567.8	33.7%	0.1%	Yes
Non-Mfg. employment	512.4	33.5%	0.3%	Yes
Goods-producing employment	73.7	34.1%	-1.5%	Yes
Private, services-providing employment	412.2	33.3%	0.4%	Yes
State & Local Gov. employment	76.0	35.4%	0.0%	Yes
Personal Income (Millions)	\$ 61,812.4	24.6%	3.0%	No
Wage Disbursements (Millions)	\$ 37,422.5	33.1%	2.6%	Yes
Average Annual Wage, (Thousands)	\$ 65.9	98.1%	2.5%	Yes
Per Capita Income (Thousands)	\$ 59.0	84.3%	2.7%	No
Gross County Product (Millions)	\$ 80,172.5	30.5%	2.7%	No
Total population (Thousands)	1,046.9	29.2%	0.3%	Yes
Pop. 25 thru 64 (Thousands)	721.2	29.0%	0.2%	Yes
Households (Thousands)	402.6	29.4%	0.3%	No
Total Retail Sales (Millions)	\$ 17,713.5	28.8%	2.8%	Yes
Gross County Product per worker (\$ per job)	\$ 141,210	90.6%	2.6%	No

Note 1: the data above is for Hartford and Tolland Counties

Note 2: the three cells shaded gold in column 3 are expressed as the ratio of the CROG level in 2017 over the State level in 2017, all other values in the column show the CROG's share of the Statewide total in 2017.

Note 3: a Yes in column 5 indicates that the average annual growth rate in the CROG for the row variable was higher than the average annual growth rate in Connecticut, and vice versa.

Source: IHS Markit, 2018. US Regional county economic forecast for Connecticut

Chart 1: Historic Change in the Performance and Structure of the Hartford MSA's Economy by Major Sector based on Employment

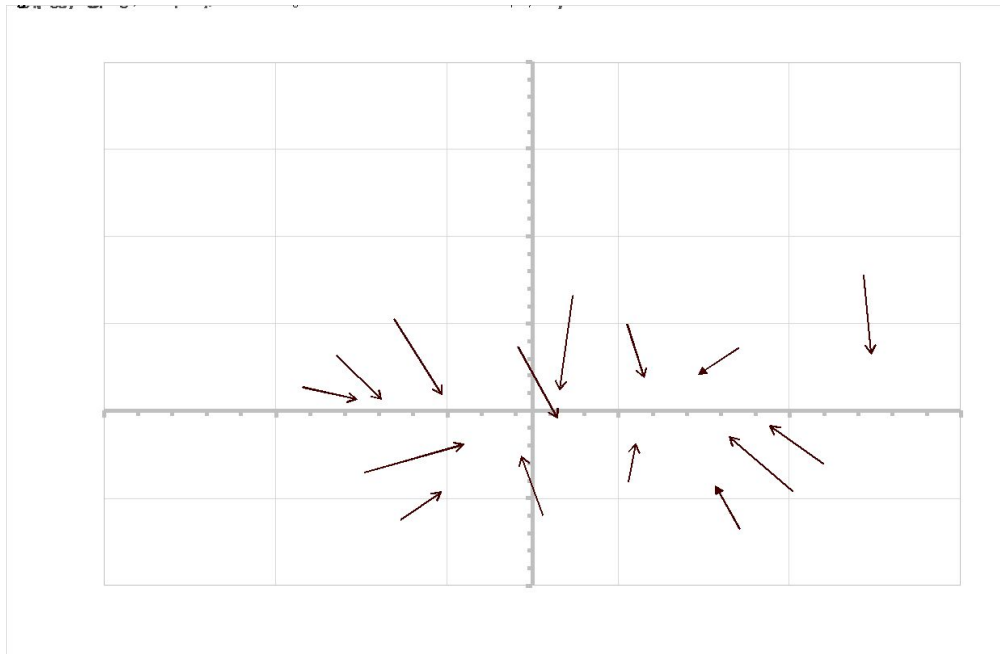


Chart 2: Historic Change in the Performance and Structure of the Hartford MSA's Economy by Major Sector based on Output



Table 2: Comparative Wage Levels by Economic Sector in 2016

Sector	Hartford MSA	CT	MA	RI	US	Ratio of Hartford MSA wage to:			
						CT	MA	RI	US
Natural Resources and mining	\$ -	\$ 38,459	\$ 57,907	\$ 39,307	\$ 56,110	NA	NA	NA	NA
Construction	\$ 68,265	\$ 66,553	\$ 72,724	\$ 58,262	\$ 58,643	102.6%	93.9%	117.2%	116.4%
Manufacturing	\$ -	\$ 79,467	\$ 86,382	\$ 56,121	\$ 64,860	NA	NA	NA	NA
Trade, transportation, and utilities	\$ 43,066	\$ 49,589	\$ 49,414	\$ 41,517	\$ 44,758	86.8%	87.2%	103.7%	96.2%
Information	\$ 99,415	\$ 102,270	\$ 110,444	\$ 72,436	\$ 98,475	97.2%	90.0%	137.2%	101.0%
Financial activities	\$ 119,836	\$ 150,465	\$ 129,993	\$ 84,841	\$ 88,822	79.6%	92.2%	141.2%	134.9%
Prof. and business services	\$ 74,417	\$ 87,436	\$ 97,740	\$ 66,557	\$ 69,964	85.1%	76.1%	111.8%	106.4%
Education and health services	\$ 51,242	\$ 53,142	\$ 56,479	\$ 46,949	\$ 48,058	96.4%	90.7%	109.1%	106.6%
Leisure and hospitality	\$ 20,648	\$ 22,506	\$ 25,736	\$ 21,548	\$ 22,431	91.7%	80.2%	95.8%	92.1%
Other services	\$ 34,325	\$ 32,807	\$ 36,283	\$ 31,934	\$ 35,923	104.6%	94.6%	107.5%	95.6%
Federal Government	\$ 71,642	\$ 73,242	\$ 78,183	\$ 79,502	\$ 78,379	97.8%	91.6%	90.1%	91.4%
State Government	\$ 73,448	\$ 69,963	\$ 67,224	\$ 65,931	\$ 57,175	105.0%	109.3%	111.4%	128.5%
Local Government	\$ 57,532	\$ 56,410	\$ 58,192	\$ 59,152	\$ 48,440	102.0%	98.9%	97.3%	118.8%
Total, all industries	\$ 62,760	\$ 65,875	\$ 67,429	\$ 51,446	\$ 53,611	95.3%	93.1%	122.0%	117.1%

Source: Bureau of Labor Statistics, 2018. Quarterly Census of Employment and Wages

Note 1: the values presented in columns 7, 8, 9, and 10 are ratios of the Hartford MSA wage in the row sector over the wage level in the row sector for the comparison area shown at the top of the column. A value less than 100% shows that the wage level in the Hartford MSA was less than the wage level in the comparison area for that sector, and vice versa. Cells shaded green in the four columns identify sectors where the wage level in the Hartford MSA was lower.

Note 2: wage estimates were downloaded from the BLS website for the Quarterly Census of Employment and Wages; NA indicates that BLS did not provide an figure for that sector. The following table 3 presents wage data by sector downloaded from the website of the Connecticut Department of Labor's Office of Research.

Note: Natural resources and mining includes agriculture, forestry, hunting, fishing, and mining.

Table 3: Wages Levels and Growth Rates by Economic Sector in the Hartford Labor Market

NAICS code and description	2007q3	2017q3	Average Annual Growth Rate
11 Agriculture, forestry, fishing and hunting	\$ 26,587	\$ 33,072	2.21%
21 Mining	\$ 61,919	\$ 69,180	1.12%
22 Utilities	\$ 92,552	\$ 153,616	5.20%
23 Construction	\$ 54,285	\$ 68,700	2.38%
31-33 Manufacturing	\$ 63,925	\$ 77,308	1.92%
42 Wholesale trade	\$ 60,642	\$ 79,148	2.70%
44-45 Retail trade	\$ 27,424	\$ 31,444	1.38%
48-49 Transportation and warehousing	\$ 38,097	\$ 41,708	0.91%
51 Information	\$ 62,106	\$ 86,352	3.35%
52 Finance and insurance	\$ 83,104	\$ 106,540	2.52%
53 Real estate and rental and leasing	\$ 41,199	\$ 55,280	2.98%
54 Professional and technical services	\$ 70,218	\$ 86,360	2.09%
55 Management of companies and enterprises	\$ 110,599	\$ 99,800	-1.02%
56 Administrative and waste management	\$ 34,317	\$ 39,456	1.41%
61 Educational services	\$ 42,067	\$ 52,696	2.28%
62 Health care and social assistance	\$ 44,281	\$ 51,076	1.44%
71 Arts, entertainment, and recreation	\$ 18,627	\$ 21,516	1.45%
72 Accommodation and food services	\$ 16,109	\$ 20,324	2.35%
81 Other services	\$ 29,991	\$ 34,136	1.30%
Federal	\$ 57,194	\$ 69,240	1.93%
State	\$ 68,352	\$ 74,240	0.83%
Local	\$ 43,062	\$ 55,232	2.52%
Average All Sectors, All Ownerships	\$ 51,468	\$ 60,016	1.55%

Source: Connecticut Department of Labor, Labor Market Information, various years

http://www1.ctdol.state.ct.us/lmi/202/202_annualaverage.asp

Note 1. The Hartford Labor Market Area consists of 54 towns located in portions of Hartford, Litchfield, Middlesex, New London, Tolland, and Windham Counties

Note 2. 2017q3 wages for the private sectors are for private ownership as published by the Connecticut Dept. of Labor as part of the QCEW Program.

Table 4: Alternative Economic Forecasts for the Hartford MSA

Variable	Historic and Forecast Values					Average Annual Growth Rates			
	2008	2013	2018	2023	2028	2008 to 2013	2013 to 2018	2018 to 2023	2023 to 2028
Total Employment (thousands of jobs)									
Pessimistic		623.5	648.3	647.3	643.4		0.8%	0.0%	-0.1%
Baseline	641.4	623.5	648.3	653.2	646.3	-0.6%	0.8%	0.2%	-0.2%
Optimistic		623.5	651.1	667.0	665.7		0.9%	0.5%	0.0%
Manufacturing Employment (thousands of jobs)									
Pessimistic		64.0	68.3	66.3	64.1		1.3%	-0.6%	-0.7%
Baseline	72.6	64.0	68.3	66.9	64.7	-2.5%	1.3%	-0.4%	-0.7%
Optimistic		64.0	68.7	67.2	65.5		1.4%	-0.4%	-0.5%
Private, Services-providing employment (thousands of jobs)									
Pessimistic		443.0	466.2	462.3	458.1		1.0%	-0.2%	-0.2%
Baseline	445.7	443.0	466.3	467.4	460.9	-0.1%	1.0%	0.0%	-0.3%
Optimistic		443.0	468.0	476.1	473.2		1.1%	0.3%	-0.1%
Total Personal Income (Millions of \$)									
Pessimistic		\$ 66,645.7	\$ 75,401.5	\$ 90,825.4	\$ 109,460.6		2.5%	3.8%	3.8%
Baseline	\$ 61,074.2	\$ 66,645.7	\$ 75,469.0	\$ 92,696.8	\$ 110,545.5	1.8%	2.5%	4.2%	3.6%
Optimistic		\$ 66,645.7	\$ 76,622.3	\$ 97,844.0	\$ 118,879.8		2.8%	5.0%	4.0%
Gross Metro Product (Millions of \$)									
Pessimistic		\$ 82,699.2	\$ 93,238.9	\$ 112,004.2	\$ 133,782.4		2.4%	3.7%	3.6%
Baseline	\$ 78,634.7	\$ 82,699.2	\$ 93,365.1	\$ 114,128.2	\$ 135,276.7	1.0%	2.5%	4.1%	3.5%
Optimistic		\$ 82,699.2	\$ 95,254.7	\$ 120,513.7	\$ 145,872.1		2.9%	4.8%	3.9%
Real Per Capita Personal Income (thousands of \$)									
Pessimistic		\$ 50.7	\$ 54.2	\$ 58.2	\$ 61.9		1.3%	1.4%	1.3%
Baseline	\$ 50.1	\$ 50.7	\$ 54.2	\$ 59.5	\$ 63.5	0.3%	1.3%	1.9%	1.3%
Optimistic		\$ 50.7	\$ 54.8	\$ 62.9	\$ 68.6		1.6%	2.8%	1.8%
Average Annual Wage (thousands of \$)									
Pessimistic		\$ 61.1	\$ 66.8	\$ 81.1	\$ 98.5		1.8%	3.9%	4.0%
Baseline	\$ 55.5	\$ 61.1	\$ 66.8	\$ 81.7	\$ 99.4	1.9%	1.8%	4.1%	4.0%
Optimistic		\$ 61.1	\$ 67.6	\$ 83.7	\$ 101.8		2.0%	4.4%	4.0%
Population (thousands of persons)									
Pessimistic		1,216.6	1,210.4	1,215.2	1,225.6		-0.1%	0.1%	0.2%
Baseline	1,205.0	1,216.6	1,210.4	1,215.2	1,225.6	0.2%	-0.1%	0.1%	0.2%
Optimistic		1,216.6	1,210.4	1,215.6	1,225.8		-0.1%	0.1%	0.2%
Retail Sales (millions of \$)									
Pessimistic		\$ 18,227.9	\$ 20,857.4	\$ 24,186.2	\$ 27,918.0		2.7%	3.0%	2.9%
Baseline	\$ 16,856.1	\$ 18,227.9	\$ 20,850.1	\$ 24,706.2	\$ 28,259.6	1.6%	2.7%	3.5%	2.7%
Optimistic		\$ 18,227.9	\$ 21,121.2	\$ 26,427.4	\$ 31,225.0		3.0%	4.6%	3.4%
Housing Starts (total units, annual rate)									
Pessimistic		1,529	2,025	2,619	2,387		5.8%	5.3%	-1.8%
Baseline	1,832	1,529	1,989	2,711	2,484	-3.5%	5.4%	6.4%	-1.7%
Optimistic		1,529	2,238	3,215	3,185		7.9%	7.5%	-0.2%

Note: 2008 values are not shown for the Pessimistic and Optimistic scenarios as they were the same as in the baseline. While 2013 values were also the same under the 3 scenarios, they are shown as they affect the annual growth rates from 2013 to 2018 which is the first year of the forecast period. As a result 2018 values will differ slightly across the three scenarios.

3. Case Studies

The following case studies are taken from cities and regions around the country. They each briefly highlight a specific, successful project that may offer best practices or other lessons to the Hartford region.



San Antonio, TX | Alamo Academies

Conceived in 2001, Alamo Academies provides apprentice-style training to high school juniors and seniors in San Antonio that is focused on high-wage, in-demand industry credentials. The program is organized around sector-specific academies—initially beginning with an Aerospace Academy (designed to create a workforce pipeline for Lockheed Martin and other major contractors in the region). Additional academies have since been added: IT (in 2002), Manufacturing (in 2004), Health Professions (in 2009), and Heavy Equipment (in 2014). Attendance to the academies is free of cost to all eligible students, yet the program provides both a high school diploma and a college degree (Associate of Applied Science), in addition to transferable college credits. After completing the program, 94% of graduates either continue to additional higher education or enter directly into a high-wage, in-demand job. The Alamo Academies model has been recognized nationally, having won several awards and received various recognition for its innovative, industry-focused program design and curriculum.

Key Takeaways:

- The program couples **high school and college education**, as well **industry-specific credentials** in a **tuition-free** program.
- Specific academies have been created in response to **industry demand**, leading to exceptional **job placement and compensation** rates.



Indianapolis, IN | Central Indiana Corporate Partnership

The Central Indiana Corporate Partnership (CICP) brings together leaders across industrial sectors through its six targeted initiatives, each of which lives under its own brand:

- AgriNovus (agricultural innovation),
- Ascend Indiana (workforce development),
- BioCrossroads (life sciences),
- Conexus (advanced manufacturing and logistics),
- Energy Systems Network (energy technology), and
- Tech Point (information technology).

Indianapolis was highlighted as one of three precedents in the recent book, *The New Localism*, in which authors Bruce Katz and Jeremy Nowak write about the noticeable success that CICP has had in the last two decades. The overarching message of the book is that local leadership is driving the future of economic development, and CICP's efforts exemplify that message. As a result of its coherent organization and advocacy, CICP has become a model for spurring investment and creating impactful industry-wide strategy that resonates throughout the private sector. What sets CICP apart is its leadership and clarity of focus in each of its key industry areas. Ascend Indiana, the most recent of CICP's initiatives, explores workforce challenges and opportunities across sectors broadly and seeks to connect talent with employers in the region. In addition, the CICP's other initiatives include sector-specific workforce development projects. The Conexus internship program, for example, was created in 2015 and has matched hundreds of advanced manufacturing interns based on employer-identified need. Also, a recent grant-funded (\$4.2 million) AgriNovus campaign is being developed to raise awareness of opportunities and promote entrepreneurship within the agri-science sector.



Baltimore, MD | Sector-Specific Training and Apprenticeships

For more than ten years, the Baltimore Workforce Funders Collaborative (BWFC)—an affiliate of the National Fund for Workforce Solutions—has been bringing together businesses and resource providers in the city of Baltimore to address the challenge and opportunity of the area’s un- and under-employed population. More than a traditional job training program, the BWFC’s work focuses on specific sectors, high-wage entry level employment with career potential, and programs that yield in-demand credentials. They work with businesses through a process they refer to as “deep engagement” to match their training programs with industry needs. BWFC also works hard to remove other barriers to employment for their participants through case management services. And they rigorously analyze the effectiveness of their methods through monitoring and follow-up. According to a 2017 report:

- “70-90% of participants successfully completed training and received at least one industry credential”
- “72-93% of program completers obtained employment after training,” and
- “68-95% were still employed after six months.”

Models like the one championed by BWFC have been demonstrated to be successful in other locations, and states are adopting similar, sector-specific approaches. In 2013, the state of Maryland funded the Maryland EARN program, which grants funding for Strategic Industry Partnerships throughout the state. The Connecticut Apprenticeship Initiative specifically cites Maryland’s EARN Program as a precedent.

Key Takeaways:

- By engaging deeply with employers in specific sectors, BWFC can identify in-demand opportunities for high-wage, credential-based job training in specific sectors.
- By using case management staff to remove employment barriers, BWFC gives their participants—especially those coming from disadvantaged backgrounds—a better chance of success.
- By monitoring the performance of participants, including long-term follow-up after job placement, BWFC can improve their program design, and ensure long-term outcomes are being achieved.



Pittsburgh, PA | Diversity in Tech

Pittsburgh's Mayor, Bill Peduto, likes to use a simple phrase to convey Pittsburgh's policy of inclusion: "If it's not for all, it's not for us." But, Pittsburgh's history has not been entirely one of equality across lines of gender and race. Today, however, as the city's economy transitions from its historical roots as an industrial (steel) capital to a technology (STEAM) hub, the city's leadership is trying to do better, and that starts with inclusion. The city convenes an annual week of activities called Inclusive Innovation Week, which brings professionals together in an attempt to create a more diverse local tech ecosystem. It also sponsors initiatives like Rec2Tech, made possible by grant funding from a local foundation, which uses community centers to teach kids technology skills and inspire interest in technology careers. In addition to public initiatives, private companies and institutions are promoting a more equitable path to towards technology careers. Black Tech Nation, which grew out of Black Tech Pittsburgh, is a national organization devoted to creating more opportunities for African Americans. Local organizations like Science Tots and Moms Can Code (both founded by Pittsburgh local Erica Peterson) also attempt to build skills among young girls and women to bridge the gender gap within engineering and technology industries. The city's major institutions play their role too. Carnegie Mellon University, consistently ranked among the world's best universities for computer science, and engineering, is working with high schools to promote programming skills to disadvantaged students and underrepresented groups. In 2018, it enrolled its first-ever majority-female class of students. The Carnegie Science Center—a museum that offers educational programming—has created several exciting, girl-focused STEM education programs for local K-12 students. And in 2009, based on work done by a group of Carnegie Mellon graduate students, the Pittsburgh Public School System created a public STEM high school, the Pittsburgh Science and Technology Academy, which takes an innovative pedagogical approach to STEM education for its majority non-white student body.

Case Study Key Takeaways:

- In Pittsburgh, the confluence of public, private, and institutional players working to create equitable access to STEM careers is helping to build an **inclusive ecosystem**.
- By focusing on key skills in growing technology and engineering industries, Pittsburgh hopes that it will not only be a hub for employers, but that it will be home to a **diverse and skilled workforce** that is representative of its population across lines of race and gender.



Boston, MA | City Year

In 1988, two Harvard graduates established a new organization in Boston called City Year, which sought to provide opportunities to participate in a “year of service” to young people in the community. City Year became a success and was the model for the national AmeriCorps program established under the Clinton administration. Today, City Year (now under the umbrella of AmeriCorps) is also active in many other cities and other countries. Its participant teams partner with schools to support student outcomes in disadvantaged communities. The benefits are many-fold for the communities where City Year works. By providing opportunities for service, participants (some of whom come from other places to serve) become invested in a community. The year-long, full-time service experience (which pays a small stipend as well as a scholarship) provides great professional experience for participants and is designed to develop soft skills for participants. Indeed, most participants in AmeriCorps programs—including City Year and others—report that their service experience not only makes them more likely to be engaged in their communities, but that it helps them in their career, including by building various, specific interpersonal skills. For City Year specifically—which partners with schools to tutor students, focusing on disadvantaged communities—both the academic and interpersonal outcomes of the program go beyond participants to include the students being served, thereby building another generation’s human capital.

Case Study Key Takeaways:

- Service programs like City Year help **participants build interpersonal skills** and **gain professional experience**.
- Through partnerships with public schools, City Year helps students in disadvantaged communities, developing the workforce of tomorrow through **both service participants and the students** they serve.



Minneapolis/Saint Paul, MN | Transit Oriented Development

The Minneapolis/Saint Paul, MN, region (MSP) is led by an uncommonly strong regional government, the Metropolitan Council, which has prioritized investment in and around transit systems for many years—including development of light rail, bus rapid transit (BRT), and other public transit and multimodal infrastructure. In 2013, it formally adopted a Transit-Oriented Development (TOD) policy and created a corresponding TOD plan and office, which will continue encouraging development along transit corridors and advancing efforts to stimulate economic growth through public-private investment. The Council’s TOD program includes grant funding for development projects, resource sharing and private sector engagement initiatives, a specific charge to focus on TOD projects that advance equity for residents, and an emphasis on public-private development. As a result, MSP enjoys a reputation as a highly walkable/bikeable and transit-friendly community (a significant draw for its growing population of young professionals) and the region continues to see widespread investment along its major transit corridors.

Case Study Key Takeaways:

- MSP invested significant public resources in a multimodal transit system that has proved an economic development driver by both making the city more **livable for residents** and by stimulating **private development** in transit-adjacent areas.
- By formally **adopting transit-oriented development as a policy**, the region will set itself on a path to continue its current pattern of growth along key transit corridors.



Sacramento, CA | Inclusionary Zoning Policy

Like many other cities, Sacramento's patterns of development throughout the 20th century were marred by racially discriminatory housing policies, such as redlining, and social fears that led to so-called "white flight." Sacramento, however, was an early adopter of a practice known as Inclusionary Zoning, which aims to create future development that is more equitable. Facing a dearth of affordable housing and rapidly growing prices in many neighborhoods in the late twentieth century, the city implemented an ordinance in 2000 that required 15% of new housing in the city's designated "growth areas" to be affordable. Although the rule only had an overt focus on housing costs, its effects have gone well beyond just affordability. Today, the city has become one of the most diverse and integrated American cities at a neighborhood scale. Homeownership among disadvantaged groups has risen, schools have become less segregated and student performance has improved, and the cultural fabric and economic foundation of the city has been strengthened.

Case Study Key Takeaways:

- Sacramento was able to create a policy addressing equitable development in response to a **shortage of affordable options** and with the support of **forward-thinking political leadership**.
- A simple policy had dramatic effect on both its stated objective, **affordability**, and wide-ranging connected issues related to **racial and economic segregation**. At its core, it simply required development in neighborhoods to include low-cost housing options.
- Sacramento was growing rapidly at the time the ordinance was adopted. If development is limited or stagnated, it must be catalyzed for the growth necessary to foster the development of the required inclusionary units.



Denver, CO | Cultural Asset Building

While it would hardly be recognizable now, Denver's downtown in the 1980's was largely lifeless. Spurred by public and private investment in infrastructure and public amenities over the last three decades, today it is among the most vibrant in the country. Through coordinated efforts (led by the Denver Economic Development Corporation and the Chamber of Commerce) that brought together businesses, public resources, institutional interests, and residents, downtown Denver's public spaces and physical infrastructure were revitalized. These efforts paved the way for businesses to grow or locate in the downtown and created demand for downtown housing. Some of the most significant development efforts included parks, transit hubs, and cultural facilities. These assets were also supported by an innovative regional financing mechanism called the Scientific and Cultural Facilities District, established through a public vote in 1988 following a campaign by the Chamber to raise support. For thirty years, the district has funded hundreds of regional cultural organizations through a small sales tax.

Today, in addition to providing public financial support for existing physical and cultural infrastructure, the Metro Denver Economic Development Corporation is committed to be the "first money in" on economic development projects. The regional and the city's public and private leaders continue to invest in the now-bustling downtown, as Denver—now a major destination for young, educated workers—continues to grow.

Case Study Key Takeaways:

- **Cultural infrastructure**, including both physical spaces and institutions, was central to Denver's early efforts to revitalize its downtown.
- **Public-private partnership** (coordinated by the EDC) provided critical funding
- The city also relied on **public support** through the innovative model of an **asset district** to finance the cultural institutions vital to a vibrant downtown.



Detroit, MI | Retail Revitalization

Detroit has seen a greater economic decline than perhaps any other American city. Once a major hub of industry, commerce, fashion, and culture, Detroit is now largely identified with vacant land and empty spaces and buildings. But many of the hundreds of thousands of Detroit residents who remain in the city are seeking ways to breathe new life into its once-bustling physical infrastructure. In 2012, a program called REVOLVE Detroit was created by the public-private Detroit Economic Growth Corporation to focus specifically on the promoting the re-use of vacant commercial space. The program provided funding and support for art events/exhibits, beautification, and pop-up retail opportunities in vacant storefronts, and focused efforts on specific neighborhoods in an attempt to catalyze. Other similar initiatives, such as Hatch Detroit (founded in 2011), also provide technical support and grant opportunities for small commercial enterprises attempting to establish themselves. Both REVOLVE and Hatch were designed to work closely with local community members and organizations.

Case Study Key Takeaways:

- Initiatives like REVOLVE and Hatch supply a variety of support to both building owners and prospective tenants, including **grants to businesses** and **physical improvements**.
- By focusing in specific neighborhoods, working with the local community, and **creating a vibrant atmosphere**—through beautification, public art, events, and so forth—these programs attempt **to catalyze private investment** in commercial enterprises.



Akron, OH | Regional Ambassadorship

The city of Akron, OH, and its surrounding region has struggled with a challenge plaguing many communities across the country: the exodus of young people and workforce. Torchbearers, a local organization for young professionals, was founded 15 years ago—initially in an attempt to connect young talent with local non-profits. The group has now taken on the mission of attracting and retaining young professionals broadly. Leadership Akron, the city’s community and business leadership organization, is now working with Torchbearers Akron on talent attraction initiatives. Partnering with local businesses, Leadership Akron now offers a program called Destination Akron (with support from a small grant), through which it engages new and potential hires considering a move to the region in a personal tour and chance to experience (“sell”) the city. The challenge of generational migration cannot be solved overnight, but programs like this are using the existing population of young professionals in cities like Akron to give those places a strategic advantage in the struggle for young talent.

Case Study Key Takeaways:

- Torchbearers was established to provide **opportunities and support for the young talent** already in the city of Akron. From that initial purpose, it has grown into an expanded, external-facing role.
- By partnering together, Leadership Akron, local businesses, and Torchbearers can use the city’s current population of young people as **ambassadors to potential workers**.



Philadelphia, PA | Regional Economic Development Collaboration

Nothing tests the bounds of regional collaboration quite like a huge (and very public) project competition and a short response timeframe. Philadelphia, PA was tested in 2017, as were no fewer than 238 other metropolitan areas, by Amazon's announcement of its search for a location for its HQ2, a \$5 Billion investment with a potential 50,000 new jobs. The proposal process required a comprehensive response due very quickly, just to achieve a spot in the suddenly coveted "Final 20" communities under consideration. Recognizing the regional impact, and regional benefit, of such a large-scale project required marshalling the cooperation and efforts of a large number of both city and regional groups, given that Philadelphia draws its workforce from five Pennsylvania counties (Bucks, Chester, Delaware, Montgomery, and Philadelphia), New Jersey (Burlington, Camden, Gloucester) and Delaware (Newcastle). Coordinated by the City's Commerce Department, the Philadelphia Industrial Development Corporation, and other partners, the City and Region were able to assemble a cohesive package that highlighted the City, Region, its sites, its workforce, its universities, its culture, quality of life, housing and history and secure a slot in the "Final 20". Even if Philadelphia is unsuccessful, the exercise in regional collaboration and coordination in responding to an economic opportunity is a valuable exercise that leverages other efforts that have thrust the region into the national and international spotlight such as the visit of the Pope and the 2016 Democratic National Convention.



Columbus, OH | Leveraging External Resources through Collaboration

The Columbus Partnership is an organization of business and institutional leaders, formed in 2002, to be “thought leaders—strategically considering how to position the community for the future.” The Partnership and the City of Columbus recently worked together to create the Smart Columbus initiative. Smart City technology in Columbus helps to connect employees to work, allows public services to function more efficiently, and helps the city mitigate its environmental impact. To invest in smart infrastructure, the Partnership brought together public and private resources, totaling over \$90 million in funds raised. They also sought to build widespread support for the effort locally. These investments, along with the community engagement, led the city to win the inaugural Smart Cities Challenge—beating out 77 other contenders. As winners, they will receive \$40 million in federal investment and an additional \$10 million from Vulcan, Inc. (Microsoft co-founder Paul Allen’s company). In addition, as part of the 33 Smart Mobility Corridor, the region has also seen significant investment from the US Department of Transportation. By bringing together diverse interests through coordinated efforts, Columbus provides an excellent example of how a region can leverage external investment.

Case Study Key Takeaways:

- The city **bet big on large investments** in tech infrastructure and found that those investments were a *smart* move economically, **raising tens of millions in direct outside investment** through the Smart Cities Challenge.
- **Public engagement and private sector investment** were key reasons why Columbus was successful in the challenge.



Nashville, TN | Entrepreneurial Ecosystem Development

As part of a wider economic development effort called Partnership 2020 (previously, Partnership 2010 and Partnership 2000), Nashville leaders have identified entrepreneurship as a critical opportunity for the region's economy. In 2007, a large (75+ member) task force of local leaders was formed by the Chamber of Commerce to strengthen the area's entrepreneurial resources. In 2010, those efforts led to the creation of a regional entrepreneur center (funded by the EDA), which has since "graduated" over 150 businesses from its program offerings. The local entrepreneur support network pairs entrepreneurs with advisors and connects start-ups with other resources, such as the Jumpstart Foundry, a successful business accelerator. Local and regional efforts have been reinforced by the state, through programs like TNInvestco, a \$200 million dollar investment, as well as a robust network of private capital. Today, Nashville is recognized as a hub of entrepreneurship and start-up activity.

Case Study Key Takeaways:

- Nashville sought to develop its **entrepreneurial ecosystem**—beyond simply direct support for entrepreneurial enterprises—and it based its investment priorities on robust input from its **leadership task force**.
- Local efforts have been bolstered by outside investment from various sources. In Nashville the included both federal and state dollars (as well as private capital), but the broader point worth noting is that public money is often well-poised to **leverage outside funding** related to entrepreneurship.

4. Public Comment

The Capitol Region Council of Governments will be releasing this plan for public comment in early 2019. This Appendix will be amended to include feedback received from the public.