Appendix A

Data Analysis: Comprehensive Economic Development Strategy

Southeastern Connecticut Enterprise Region (seCTer)

December 2016

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Prepared for:

Southeastern Connecticut Enterprise Region (seCTer)
19B Thames Street
Groton, CT 06340

camoin associates
ECONOMIC DEVELOPMENT

120 West Avenue, Suite 303
Saratoga Springs, NY 12866

518.899.2608

www.camoinassociates.com

About Camoin Associates

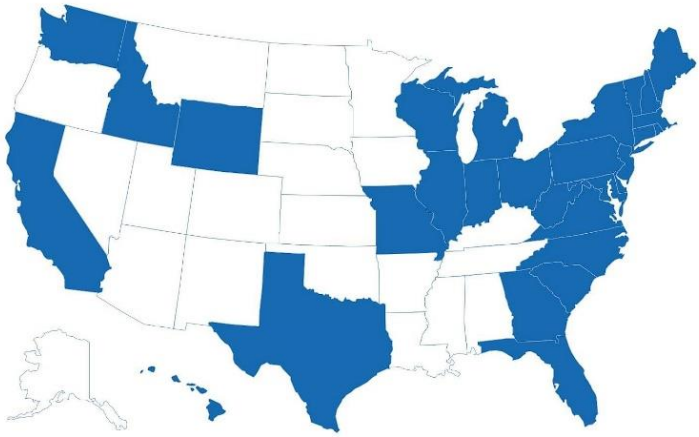
Camoin Associates has provided economic development consulting services to municipalities, economic development agencies, and private enterprises since 1999. Through the services offered, Camoin Associates has had the opportunity to serve EDOs and local and state governments from Maine to California; corporations and organizations that include Lowes Home Improvement, FedEx, Volvo (Nova Bus) and the New York Islanders; as well as private developers proposing projects in excess of $600 million. Our reputation for detailed, place-specific, and accurate analysis has led to projects in 28 states and garnered attention from national media outlets including *Marketplace* (NPR), *Forbes* magazine, and *The Wall Street Journal*. Additionally, our marketing strategies have helped our clients gain both national and local media coverage for their projects in order to build public support and leverage additional funding. The is based in Saratoga Springs, NY, with regional offices in Portland, ME; Boston, MA; and Brattleboro, VT. To learn more about our experience and projects in all of our service lines, please visit our website at www.camoinassociates.com. You can also find us on Twitter @camoinassociate and on Facebook.

The Project Team

Jim Damicis
Senior Vice President, Project Principal

Tom Dworetsky
Economic Development Analyst, Project Manager

Dina DeCarlo
Economic Development Analyst, Project Staff



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Introduction and Summary

The Southeastern Connecticut Enterprise Region (seCTer) is in the process of developing the 2016 Comprehensive Economic Development Strategy (CEDS) for the region. In order to frame the development of strategies, goals, and objectives that will comprise the CEDS, seCTer commissioned Camoin Associates to prepare an analysis of regional demographic and economic data. Contained within this document are a series of profiles containing key data for the region overall and, where noted, for its constituent municipalities:

- Demographic and Socioeconomic Profile – Key demographic indicators for the population of the region and its municipalities, including age, race/ethnicity, home ownership, income, language, nativity, poverty, transportation, migration patterns, and commutation patterns
- Workforce Profile – Demographic data on the region's workforce, including gender, age, and race/ethnicity; and data on the region's occupations and educational programs
- Innovation Profile – Data on key innovation metrics for the region as compared to three peer regions
- Fiscal Profile – Grand list, mill rate, and bond rating information
- Economic Profile – Data on the regional economy, including employment, earnings, gross regional product, establishments, shift share analysis, and retail gap analysis
- Targeted Industry Profile – Detailed data on key industry sectors and insights on targeted opportunities

Within each section there is a listing of key findings and what they mean for regional economic growth. To further help with designing a framework and approach to strategies for regional economic growth we also offer the following summary specifically related to Targeted Industry Clusters.

Geography

The seCTer region is defined as the following 20 municipalities: Bozrah, Colchester, East Lyme, Franklin, Griswold, City of Groton, Town of Groton, Lebanon, Ledyard, Lisbon, Montville, New London, North Stonington, Norwich, Preston, Salem, Sprague, Stonington, Waterford, and Windham. Throughout the report, the term "seCTer region" refers to this grouping of municipalities.

Note that the City of Groton is a political subdivision of the Town of Groton. Throughout this report, however, data for the Town of Groton applies only to the balance of the Town, excluding the City.

Figure 1: Map of seCTer region

Note that for certain indicators, data is only available at the county level and is thus provided for New London County and not the seCTer region. The applicable geography is specified throughout the report. The seCTer region is coterminous with New London County with the following exceptions: (1) the seCTer region *includes* the Town of Windham, which is in Windham County, and (2) the seCTer region *excludes* three New London County municipalities: Lyme, Old Lyme, and Voluntown.

Targeted Industry Clusters

To help understand industry niches and targeted opportunities in the region, we examined as part of the data analysis employment, occupations and earnings according to customized industry groupings or "clusters." This examination was based on a complete review of data down to the most detailed industry classification level (6-digit NAICS) to identify trends, strengths, and weakness. It was also based on our review of targeted Industries identified previously by seCTer, industry focus groups conducted for this analysis, and our experience with targeted industry trends throughout the US and Northeast. Based on this process we analyzed nine industry groupings to potentially target as clusters including:

- Tourism
- Healthcare Services
- Defense
- Energy and Environment
- Bioscience
- Agriculture, Fishing, and Food Production
- Creative
- Advanced Manufacturing
- Maritime

For each we examined data on employment, output as measured by contribution to gross regional product (GRP), and occupations. Based on the data we include key findings within each and what the findings mean in terms of their potential for regional economic growth strategies. In cases where focus groups were conducted, we also supplemented the data with findings from those sessions.

Key Findings

The analysis of targeted industry clusters points to three primary industry clusters in the region that are large and historically have played significant roles in the regional economy and will continue to do so. These are:

- Manufacturing (specifically, advanced manufacturing and defense)
- Healthcare
- Tourism

The region should continue to focus on these clusters for maintaining and growing the economic base. Two of these clusters (Manufacturing and Healthcare) are also the same sectors being successfully targeted by the Eastern Connecticut Workforce Investment Board working with industry, education, and workforce partners. The region should also expand workforce development efforts to include initiatives to support growth in the Tourism cluster.

The analysis also points to smaller but historically important industry clusters:

- Bioscience
- Agriculture, Fishing, and Food Production
- Maritime (excluding defense ship building)

These should also be a focus for strategies to support and grow the regional economy. More specifically:

- Bioscience on its own and related to healthcare industries; as part of entrepreneur ecosystem; and in efforts to sustain and build high-wage, high-talent businesses, employment, and entrepreneurs

- Maritime as it relates to tourism plus its connection to food (aquaculture) and manufacturing (boat building and related marine manufacturing)
- Agriculture, Fishing, and Food Production as it relates to quality of place (land, open space, cultural heritage), tourism (local food), a heathy region (healthcare initiatives), and efforts to develop and support small businesses and entrepreneurs

Finally, the analysis of targeted industry clusters points to two industry groupings which are growing in importance nationally but are not strong within the seCTer region and would need much more support and nurturing to develop capacity and grow within the region as a niche. They are:

- Creative
- Energy and Environment

We recommend that seCTer not focus on these as primary clusters at this time. However, they should be given attention within their relationships and connection to the primary clusters and overall economic development assets, needs, and strategies including:

- Skilled and talented workforce
- Entrepreneurs
- Quality of place

Detail on each cluster is presented below.

Tourism

With a significant share of regional jobs, this cluster is and will continue to be an important part of the regional economy and should be included as a primary cluster to target. The region has many assets to continue to build on including strategic coastal location, a known history and reputation for visitation, considerable recreation amenities including the Mystic Aquarium, Seaport, and Village, casinos, retail outlets, numerous accommodation and food service businesses, outdoor recreation and open space, and stakeholders to support and advocate for its growth, including Chambers of Commerce. Future success will require strategies to continue investment to maintain and expand assets and infrastructure; providing increased transportation and pedestrian options, increasing wages and overall quality of service while remaining competitive, and solidifying and coordinating existing messages into unifying themes to market the region as a whole. Coordination with agriculture and fishing industries offers opportunities for growth around local food initiatives. Rejuvenation of downtowns and village centers as quality, mixed-use places offer further opportunities, as does building on recent growth in marine related tourism (tours, ferries, etc.).

Healthcare Services

The size of the cluster in the region and projections for national and regional growth make this an important cluster as a primary target for seCTer. As consolidations and re-alignments among system providers stabilize, new opportunities to grow the cluster will emerge and take hold. Strategies should focus on workforce training, recruitment, and retention. Opportunities to leverage a region-wide, holistic initiative around health, workforce, economy, community, and food/agriculture through a "Healthy Region initiative" should be examined as it will serve residents, workers, providers, businesses and communities, and provide a positive brand around quality of place.

Defense

As a large historic base of the regional economy, with strong growth in the past five years and growth expected to continue, plus significantly higher than average earnings among jobs in skilled and STEM related trades, the defense cluster should be a primary cluster to target and leverage for regional economic growth. It also should be

considered integral to and within efforts in the region to support and grow advanced manufacturing. To further leverage this cluster, regional economic development efforts should continue to focus on workforce development to support both new growth and replacement of retiring workers and also focus on quality of place factors integrating land use, housing, and transportation needs of employers in this cluster with communities and the region. Because of this cluster's reliance on federal military contracts it is important for the regional and local economic and workforce development community to maintain ongoing communications with employers and federal representatives regarding future employment projections and needs.

Energy and Environment

The Energy and Environment cluster in the region is small and driven mostly by nuclear power generation and related industries. It also does not exhibit characteristics of a cluster in the region with related industries interacting within a network of stakeholders including businesses, entrepreneurs, educators, researchers, and service providers all supporting its growth. While this is an industry the region may want to continue to monitor as it is important globally and in other parts of the US, outside of its connections to other industry sectors such as manufacturing and skilled trades we do not recommend that this be a primary industry area for the region to focus on. Much more work in building regional assets to support its growth would need to occur relative to other focus areas.

Bioscience

Though small in terms of employment numbers, this is a niche cluster in which the region has had a historical strength, primarily due to the presence of Pfizer. It is characterized by high levels of skills and talent, high wages, and driven by innovation. Though there have been recent declines due to reductions in the region by Pfizer, there are several strong small firms in the region along with talent workers and entrepreneurs. Avery Point (though underutilized), the recent addition of CURE, and a small network of individuals committed to the success of the cluster represent assets to build on. Keys to success will be to further support and leverage these distinct assets, improve quality of life infrastructure and amenities in the region to be able to attract and retain talent and entrepreneurs, and begin to develop synergies with the growing healthcare cluster in the region. This should remain among the primary clusters to focus on in the region due to historic strength, global and national importance, innovation, and high wages.

Agriculture, Fishing, and Food Production

Agriculture, fishing, and food production is a small cluster in the seCTer region with little recent growth. Though small it is important to the region for creating opportunities for local business and entrepreneurs, maintaining and improving land and open space, providing local goods to the region and beyond, and supporting quality of life. Though not a primary cluster to focus on, we recommend including initiatives to strengthen and connect these industries to regional economic growth strategies particularly in terms of local sustainability, connections to food culture, quality of life, visitation, and tourism. Focus should be placed upon supporting small farms and producers to be competitive, technical assistance with communities on land use strategies to support the industries, marketing and education to increase local and regional demand, and tying into regional health initiatives.

Creative

The group of industries that make up the Creative cluster represent a relatively small portion of employment within the seCTer region. As a whole, this group has also experienced recent decline, while both the state and nation have experienced increases. Outside of a concentration of STEM-related occupations which exist primarily for the larger industries, namely defense, advanced manufacturing, and pharmaceuticals, the region lacks an identity as a creative economy region. We therefore do not recommend this as a primary industry focus area for the CEDS. However, many of the same needs exist within these creative industries to support future growth including quality of place amenities and infrastructure and stronger networks to attract and retain talent. Furthermore, there are opportunities for these industries to overlap with key sectors in the region including

tourism, food and agriculture, and the STEM-intensive industries. It is therefore important that the region continue to assess opportunities and efforts to build capacity to support these creative industries and related occupations.

Advanced Manufacturing

Because of its connection to the defense industry as well as supporting high-skill, high-wage jobs this is an important cluster for the seCTer region and should continue as a primary focus area. Efforts should focus on supporting EAMA and the Eastern Connecticut WIB in workforce development initiatives well as improving transportation, energy, broadband, and housing options in the region.

Maritime

This is a very small cluster, but it has higher than average wages and is important to the tourism-related economy given the region's coastal location. It should therefore be considered together with the Tourism cluster as a primary focus area for regional growth and also considered in relation to marine related manufacturing and food production.

Major Cross-Cutting Themes

Taken all together, besides developing individual strategies within each of the Targeted Clusters, three major themes cut across all sectors and are important for future regional economic growth and should be part of a regional strategy. They are:

- Workforce development –continuing and expanding the work of ECWIB and its partners and integration with business and economic development
- Quality a place – improving infrastructure, housing, and place-based amenities to support changing demands by workers, businesses, and entrepreneurs. This includes improvements and commitments to downtowns and village areas, transportation options and networks, recreation and open space, and mixed-use developments.
- Entrepreneurial Environment – support across all industry sectors and occupations through development and strengthening of networks, events, technical and financial assistance.

Demographic and Socioeconomic Profile

Key Findings

- Between 2005 and 2015, the total population increased for 13 out of 20 municipalities within the seCTer region, as well as for the seCTer region as a whole, the state of Connecticut, and the US. The City of Groton exhibited a notable population decrease of 8% over this period. The seCTer region saw on overall of increase of 1%, which is less than that of both Connecticut and the US, at 2% and 9%, respectively.
- The age distribution of the seCTer region is generally in line with that of Connecticut and the US. The portion of young adults, age 20-29, is particularly high, at 20% or higher, for the Town of Groton, Windham, and New London, compared to 15% in the entire seCTer region, 13% in Connecticut, and 14% in the US.
- The seCTer region has a higher proportion of non-Hispanic whites (78.0%) as compared to Connecticut (74.7%) and the US (70.5%). Communities with significant Hispanic populations include Windham (39.9%), New London (33.3%), the City of Groton (21.9%), and Norwich (16.1%). There are significant African American populations in New London (18.3%), the City of Groton (14.2%), and Norwich (11.6%).
- Educational attainment in the seCTer region is comparable to that in Connecticut and the US. However, disparities across municipalities are considerable. Over 20% of the population in East Lyme, Lebanon, North Stonington, Salem, and Stonington have advanced degrees, compared to 14% for the region overall. At the same time, over half of the population in Griswold, Montville, and Windham have no more than a high school diploma, compared to 42% overall.
- The home ownership rate in the seCTer region matches that of the US at 63%, which is 2 percentage points lower than that of Connecticut. The lowest homeownership rates are in New London and the City of Groton, at 34% and 39%, respectively.
- The median household income for the seCTer region is $62,059 which is nearly $8,000 higher than the median household income of the US. However, the seCTer region median household income is about $7,600 lower than that of Connecticut, which is $69,694.
- Windham, New London, and Norwich all have a notable percentage of the population speaking Spanish at home, at 30%, 22% and 11% respectively, compared to 8% in the region overall. These communities have significant foreign-born populations.
- The percentage of households below the poverty level in the seCTer region is 10.5% which is almost 4 percentage points lower than the national average, 14.4%, and nearly the same as that of Connecticut, 10.3%. In both New London and Windham, almost one quarter of the population lives below the poverty line.
- Driving is the dominant means of transportation for commuting, accounting for over 88% of workers, in line with state and national averages. Public transportation accounts for at least 5% of commuting in just two municipalities: the City of Groton and New London.
- New London County showed more in-migrants than out-migrants in 2013, with a net gain of 2,406 migrants. Windham County also showed a net gain.
- The seCTer region has seen an increase in cross-commuting with surrounding regions between 2004 and 2014, with a greater share of residents out-commuting for work, as well as a greater share of in-commuters among the region's workers.

Population

The table below shows the total population for each municipality in 2005 and 2015, compared to the seCTer region overall, the state of Connecticut, and the United States. The population total has increased for 13 out of 20 municipalities, as well as for the seCTer region, Connecticut, and the US. The remainder of municipalities saw a marginal decrease, between 3 and 55 people, with the exception of the City of Groton, which saw the most significant decrease of 751 people, or 8%. The seCTer region saw a smaller percentage increase at 1%, less than that of both Connecticut and the US, at 2% and 9%, respectively.

Table 1: Population by Municipality, 2005-2015

Population				
Geographies	2005	2015	Change 2005 - 2015	% Change 2005 - 2015
Bozrah	2,520	2,603	83	3%
Colchester	15,517	16,130	613	4%
East Lyme	18,865	19,343	478	3%
Franklin	1,898	1,975	77	4%
Griswold	11,516	11,830	314	3%
Town of Groton*	30,474	30,471	(3)	(0%)
City of Groton	9,972	9,221	(751)	(8%)
Lebanon	7,170	7,259	89	1%
Ledyard	15,017	15,025	8	0%
Lisbon	4,252	4,310	58	1%
Montville	19,292	19,396	104	1%
New London	27,217	27,179	(38)	(0%)
North Stonington	5,202	5,256	54	1%
Norwich	38,806	39,899	1,093	3%
Preston	4,746	4,707	(39)	(1%)
Salem	4,051	4,183	132	3%
Sprague	3,000	2,951	(49)	(2%)
Stonington	18,425	18,370	(55)	(0%)
Waterford	19,305	19,281	(24)	(0%)
Windham	24,528	24,799	271	1%
seCTer Region	281,773	284,188	2,415	1%
Connecticut	3,506,956	3,590,886	83,930	2%
US	296,410,404	324,164,213	27,753,809	9%

*Town of Groton data excludes data from the City of Groton
Source: ESRI

Population by Age

The following two tables display the age distribution by 10-year age cohort, by population count and percent of total. The share of young adults age 20-29 is particularly high—20% or higher—for the Town of Groton (excluding the City of Groton), Windham, and New London.

Table 2: Population by Age by Municipality, 2016 (Total)

Population by Age (Total), 2016									
Geographies	Age 0-9	Age 10-19	Age 20-29	Age 30-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79	Age 80+
Bozrah	230	321	299	283	394	469	381	183	109
Colchester	1,811	2,382	1,982	1,750	2,382	3,019	1,814	871	546
East Lyme	1,575	2,302	2,382	2,237	2,779	3,335	2,680	1,808	1,111
Franklin	187	254	174	227	295	349	284	164	63
Griswold	1,309	1,431	1,595	1,544	1,750	2,071	1,460	649	336
Town of Groton*	3,749	3,383	6,654	3,815	3,016	3,602	3,219	1,925	1,510
City of Groton	1,367	980	1,653	1,391	1,057	1,184	912	462	302
Lebanon	756	982	774	822	1,037	1,426	1,000	439	213
Ledyard	1,726	2,060	1,609	1,904	2,173	2,422	1,960	1,029	499
Lisbon	384	601	432	425	695	773	580	298	178
Montville	1,863	2,239	2,685	2,574	2,784	3,108	2,235	1,307	766
New London	3,194	4,200	6,031	3,840	3,043	3,290	2,548	1,298	895
North Stonington	527	676	409	546	824	1,049	868	418	203
Norwich	4,825	4,671	5,900	5,472	5,189	5,812	4,529	2,347	1,711
Preston	425	522	406	476	654	877	708	387	213
Salem	488	605	377	475	682	823	565	225	85
Sprague	392	388	385	428	385	523	368	176	80
Stonington	1,611	2,129	1,589	1,634	2,539	3,210	2,841	1,672	1,216
Waterford	1,786	2,363	1,766	1,869	2,715	3,410	2,734	1,753	1,393
Windham	3,010	4,160	5,211	3,204	2,673	2,845	2,431	1,333	991
seCTer Region	31,217	36,651	42,316	34,918	37,070	43,604	34,130	18,751	12,423
Connecticut	402,065	480,036	460,475	432,720	487,812	552,745	423,845	235,689	165,691
US	40,498,171	42,110,936	45,292,114	42,184,300	41,184,927	44,220,570	35,906,820	20,157,372	12,025,416

*Town of Groton data excludes data from the City of Groton

Source: ESRI

Table 3: Population by Age by Municipality, 2016 (Percent Distribution)

Population by Age (%), 2016										
Geographies	Age 0-9	Age 10-19	Age 20-29	Age 30-39	Age 40-49	Age 50-59	Age 60-69	Age 70-79	Age 80+	Total
Bozrah	9%	12%	11%	11%	15%	18%	14%	7%	4%	100%
Colchester	11%	14%	12%	11%	14%	18%	11%	5%	3%	100%
East Lyme	8%	11%	12%	11%	14%	17%	13%	9%	5%	100%
Franklin	9%	13%	9%	11%	15%	17%	14%	8%	3%	100%
Griswold	11%	12%	13%	13%	14%	17%	12%	5%	3%	100%
Town of Groton*	12%	11%	22%	12%	10%	12%	10%	6%	5%	100%
City of Groton	15%	11%	18%	15%	11%	13%	10%	5%	3%	100%
Lebanon	10%	13%	10%	11%	14%	19%	13%	6%	3%	100%
Ledyard	11%	13%	10%	12%	14%	16%	13%	7%	3%	100%
Lisbon	9%	14%	10%	10%	16%	18%	13%	7%	4%	100%
Montville	10%	11%	14%	13%	14%	16%	11%	7%	4%	100%
New London	11%	15%	21%	14%	11%	12%	9%	5%	3%	100%
North Stonington	10%	12%	7%	10%	15%	19%	16%	8%	4%	100%
Norwich	12%	12%	15%	14%	13%	14%	11%	6%	4%	100%
Preston	9%	11%	9%	10%	14%	19%	15%	8%	5%	100%
Salem	11%	14%	9%	11%	16%	19%	13%	5%	2%	100%
Sprague	13%	12%	12%	14%	12%	17%	12%	6%	3%	100%
Stonington	9%	12%	9%	9%	14%	17%	15%	9%	7%	100%
Waterford	9%	12%	9%	9%	14%	17%	14%	9%	7%	100%
Windham	12%	16%	20%	12%	10%	11%	9%	5%	4%	100%
seCTer Region	11%	13%	15%	12%	13%	15%	12%	6%	4%	100%
Connecticut	11%	13%	13%	12%	13%	15%	12%	6%	5%	100%
US	13%	13%	14%	13%	13%	14%	11%	6%	4%	100%

*Town of Groton data excludes data from the City of Groton
Source: ESRI

Race and Ethnicity

The following table provides information regarding race/ethnicity of the total population. Windham, New London, and City of Groton, all have a significant Hispanic population, 40%, 33% and 22% of the population, respectively, all three of which are higher than the regional, state, and national percentages. The City of Groton also has a significant non-Hispanic Black/African American, and non-Hispanic Asian population; whereas Bozrah, Franklin, and Lebanon all have a vast majority of non-Hispanic Whites at 95% of the population. In 10 of the 20 municipalities, non-Hispanic Whites comprise more than 90% of the population.

Table 4: Race/Ethnicity by Municipality, 2016

Race/Ethnicity, 2016							
Geographies	Percent Non-Hispanic White	Percent Hispanic, Any Race	Percent Non-Hispanic Black/African American	Percent Non-Hispanic American Indian/Alaska Native	Percent Non-Hispanic Asian	Percent Non-Hispanic Pacific Islander	Percent Other Race
Bozrah	94.5%	4.9%	1.4%	0.5%	0.6%	0.0%	1.0%
Colchester	92.6%	4.6%	2.0%	0.6%	1.6%	0.0%	1.3%
East Lyme	82.6%	6.9%	5.5%	0.3%	6.0%	0.0%	3.4%
Franklin	94.8%	3.3%	0.8%	0.6%	6.0%	0.1%	1.9%
Griswold	90.1%	4.6%	2.2%	1.0%	2.6%	0.0%	0.9%
Town of Groton*	79.2%	9.3%	6.7%	0.8%	6.0%	0.0%	2.0%
City of Groton	60.7%	21.9%	14.2%	0.9%	9.6%	0.0%	6.5%
Lebanon	94.9%	3.9%	1.4%	0.7%	0.6%	0.0%	0.8%
Ledyard	83.2%	7.5%	3.9%	2.6%	3.9%	0.1%	1.7%
Lisbon	93.1%	2.8%	1.2%	0.7%	1.7%	0.0%	0.8%
Montville	75.9%	9.8%	6.4%	1.9%	6.9%	0.1%	4.5%
New London	56.7%	33.3%	18.3%	1.0%	2.6%	0.2%	14.1%
North Stonington	92.3%	3.5%	1.4%	1.3%	1.6%	0.1%	0.4%
Norwich	65.8%	16.1%	11.6%	1.2%	8.0%	0.2%	7.4%
Preston	90.6%	3.4%	1.7%	1.4%	2.4%	0.1%	0.7%
Salem	91.1%	3.6%	1.9%	0.3%	3.6%	0.2%	0.4%
Sprague	88.0%	6.4%	2.4%	0.9%	1.2%	0.0%	3.4%
Stonington	93.2%	3.3%	1.2%	0.4%	2.1%	0.0%	0.8%
Waterford	87.6%	6.5%	3.0%	0.6%	4.1%	0.0%	1.7%
Windham	67.6%	39.9%	6.3%	0.6%	1.7%	0.1%	19.9%
seCTer Region	78.0%	13.8%	6.8%	1.0%	4.3%	0.1%	5.6%
Connecticut	74.7%	16.0%	10.8%	0.4%	4.6%	0.0%	6.6%
US	70.5%	17.9%	12.8%	1.0%	5.5%	0.2%	6.8%

*Town of Groton data excludes data from the City of Groton

Source: ESRI

Educational Attainment

The following tables breaks down education attainment for the population 25+ into six different categories. Educational attainment in the seCTer region is comparable to that of Connecticut and the US. However, the seCTer region shows a smaller percentage of the population with bachelor's degrees, compared to Connecticut and the US. This data shows that there is a significant portion of the population in East Lyme, Lebanon, North Stonington, Salem, and Stonington with advanced degrees, over 20%. There is also a notable percentage of people in Windham and New London with less than a high school diploma, 19% and 18%, respectively.

Table 5: Educational Attainment by Municipality, 2016

Educational Attainment, 2016							
Geographies	Percent with Less than HS Diploma	Percent with HS Diploma or Equivanlent/ GED	Percent with Some College/No Degree	Percent with Associate's Degree	Percent with Bachelor's Degree	Percent with Advanced Degree	Total
Bozrah	7%	37%	21%	10%	14%	12%	100%
Colchester	5%	29%	18%	9%	25%	13%	100%
East Lyme	7%	22%	19%	9%	20%	23%	100%
Franklin	7%	33%	23%	8%	15%	14%	100%
Griswold	12%	42%	19%	8%	12%	7%	100%
Town of Groton*	5%	26%	21%	8%	22%	17%	100%
City of Groton	10%	35%	23%	6%	15%	10%	100%
Lebanon	5%	24%	19%	10%	21%	21%	100%
Ledyard	5%	26%	20%	10%	21%	17%	100%
Lisbon	9%	39%	24%	9%	8%	12%	100%
Montville	11%	40%	18%	9%	13%	8%	100%
New London	18%	33%	20%	6%	13%	10%	100%
North Stonington	4%	38%	16%	6%	16%	20%	100%
Norwich	13%	36%	22%	8%	13%	8%	100%
Preston	6%	40%	21%	8%	17%	8%	100%
Salem	3%	22%	18%	13%	23%	21%	100%
Sprague	9%	41%	20%	9%	13%	8%	100%
Stonington	5%	26%	13%	7%	26%	23%	100%
Waterford	7%	30%	17%	10%	17%	18%	100%
Windham	19%	37%	19%	6%	11%	9%	100%
seCTer Region	10%	32%	19%	8%	17%	14%	100%
Connecticut	10%	28%	17%	8%	21%	17%	100%
US	13%	28%	21%	8%	19%	12%	100%

*Town of Groton data excludes data from the City of Groton
Source: ESRI

Home Ownership

The table below shows the homeownership rate in the seCTer region matches that of the US at 63%, which is 2 percentage points lower than that of Connecticut. Fifteen out of the 20 municipalities have a homeownership rate higher than that of the seCTer region and the US. The lowest homeownership rates are in New London and the City of Groton, at 34% and 39%, respectively. The highest homeownership rate is in Salem at 89%.

Table 6: Homeownership Rate by Municipality, 2016

Home Ownership Rate	
Geographies	2016
Bozrah	80%
Colchester	77%
East Lyme	78%
Franklin	87%
Griswold	70%
Town of Groton*	52%
City of Groton	39%
Lebanon	87%
Ledyard	83%
Lisbon	86%
Montville	77%
New London	34%
North Stonington	86%
Norwich	49%
Preston	82%
Salem	89%
Sprague	65%
Stonington	68%
Waterford	82%
Windham	46%
seCTer Region	63%
Connecticut	65%
US	63%

*Town of Groton data excludes data from the City of Groton

Source: ESRI

Median Household Income

The median household income for the seCTer region is nearly $8,000 higher than the median household income of the US. However, seCTer region median household income is about $7,600 lower than that of Connecticut. Salem and Colchester have the highest median household income at about $101,000 and $99,000, respectively, far exceeding that of all other municipalities, the seCTer region as a whole, Connecticut, and the US. Windham and New London have the lowest median household incomes at $40,610 and $43,053 respectively, both of which are more than $10,000 lower than the national average.

Table 7: Median Household Income by Municipality, 2016

Median Household Income	
Geographies	2016
Bozrah	$77,675
Colchester	$99,222
East Lyme	$81,577
Franklin	$82,675
Griswold	$59,417
Town of Groton*	$62,635
City of Groton	$49,348
Lebanon	$82,129
Ledyard	$82,706
Lisbon	$77,727
Montville	$65,817
New London	$43,053
North Stonington	$82,971
Norwich	$49,779
Preston	$74,007
Salem	$100,511
Sprague	$59,401
Stonington	$77,814
Waterford	$72,886
Windham	$40,610
seCTer Region	$62,059
Connecticut	$69,694
USA	$54,149

*Town of Groton data excludes data from the City of Groton

Source: ESRI

Language Spoken at Home

The percent of the population speaking English at home is 84% in the seCTer region, higher than in both Connecticut and the US. Similarly, the percent of the population speaking Spanish at home is lower in the seCTer region than both Connecticut and the US as well. Windham, New London, and Norwich all have a notable percentage of the population speaking Spanish at home, at 30%, 22% and 11% respectively.

Table 8: Language Spoken at Home by Municipality, 2014

Language Spoken at Home, 2014			
Geographies	Percent Speaking English	Percent Speaking Spanish	Other
Bozrah	97%	0%	3%
Colchester	92%	2%	5%
East Lyme	88%	4%	8%
Franklin	96%	1%	3%
Griswold	92%	4%	4%
Town of Groton*	90%	4%	6%
City of Groton	85%	7%	9%
Lebanon	97%	1%	2%
Ledyard	92%	2%	6%
Lisbon	96%	0%	4%
Montville	86%	6%	8%
New London	70%	22%	8%
North Stonington	96%	0%	4%
Norwich	76%	11%	13%
Preston	87%	1%	12%
Salem	95%	0%	5%
Sprague	97%	0%	3%
Stonington	95%	1%	4%
Waterford	87%	5%	8%
Windham	65%	30%	5%
seCTer Region	84%	8%	8%
Connecticut	78%	10%	12%
US	79%	13%	8%

Note: Includes population ages 5+
*Town of Groton data excludes data from the City of Groton
Source: ACS 2010-2014 5-year estimates and ESRI

Foreign Born Population

Nine percent (9%) of the population in the seCTer region is foreign born, somewhat lower than in Connecticut and the US, at 14% and 13%, respectively. New London and Norwich have the highest share of foreign born residents, each with 15%, higher than that of Connecticut and the US. Ten out of the twenty municipalities have a foreign born population of 5% or less.

Table 9: Foreign Born Population by Municipality, 2014

Foreign Born Population, 2014		
Geographies	Number Foreign Born	Percent Foreign Born
Bozrah	107	4%
Colchester	797	5%
East Lyme	1,625	8%
Franklin	64	3%
Griswold	677	1%
Town of Groton*	2,151	7%
City of Groton	810	9%
Lebanon	205	3%
Ledyard	1,135	8%
Lisbon	162	4%
Montville	1,435	7%
New London	4,250	15%
North Stonington	275	5%
Norwich	6,252	15%
Preston	386	8%
Salem	206	5%
Sprague	52	2%
Stonington	898	5%
Waterford	1,546	8%
Windham	2,692	11%
seCTer Region	25,725	9%
Connecticut	490,460	14%
US	41,056,885	13%

*Town of Groton data excludes data from the City of Groton
Source: U.S. Census Bureau 2010-2014 American Community Survey

Poverty

The percentage of households below the poverty level in the seCTer region is 10.5% which is almost 4 percentage points lower than the national average, and nearly the same as that of Connecticut. New London and Windham have the highest percent of households below the poverty level by far, both at about 23%. Lisbon has the lowest percent of household below poverty level at only 2.3%. In only 3 of the 20 municipalities is the percentage of households in poverty higher than the percentage nationally.

Table 10: Population in Poverty by Municipality, 2014

Population in Poverty, 2014	
Geographies	Percent of Households Below Poverty Level
Bozrah	3.4%
Colchester	4.5%
East Lyme	4.1%
Franklin	5.1%
Griswold	10.5%
Town of Groton*	7.6%
City of Groton	16.3%
Lebanon	3.6%
Ledyard	5.4%
Lisbon	2.3%
Montville	5.4%
New London	23.0%
North Stonington	5.7%
Norwich	13.2%
Preston	9.1%
Salem	4.5%
Sprague	7.4%
Stonington	5.8%
Waterford	6.9%
Windham	23.5%
seCTer Region	10.5%
Connecticut	10.3%
US	14.4%

Note: Income in the past 12 months below poverty level 2010-2014 estimate

*Town of Groton data excludes data from the City of Groton

Source: ESRI

Means of Transportation to Work

The percent of the population that drives to work (either alone or in a carpool) in the seCTer region is 88%, slightly higher than in Connecticut and the US. The percent of the population that uses public transportation to get to work is only 2% in the seCTer region, which is 3 percentage points lower than in Connecticut and the US. However, the percent of the population bicycling or walking to work is 5% in the seCTer region, 2 percentage points higher than in Connecticut and the US. The percent of the population that work from home is 4% for the seCTer region, Connecticut, and the US.

Table 11: Means of Transportation to Work by Municipality, 2014

Means of Transporation to Work, 2014					
Geographies	Percent Drive Alone or Carpooling	Percent Public Transportation	Percent Bicycle or Walking	Percent Other	Percent Work from Home
Bozrah	96%	1%	1%	0%	2%
Colchester	93%	1%	2%	1%	3%
East Lyme	93%	2%	1%	0%	4%
Franklin	95%	1%	1%	0%	3%
Griswold	96%	0%	2%	0%	2%
Town of Groton*	78%	2%	14%	1%	5%
City of Groton	84%	6%	8%	0%	3%
Lebanon	90%	1%	1%	0%	8%
Ledyard	94%	0%	1%	2%	3%
Lisbon	91%	2%	0%	6%	1%
Montville	95%	1%	2%	1%	1%
New London	73%	5%	11%	2%	8%
North Stonington	93%	0%	1%	0%	6%
Norwich	91%	4%	3%	1%	2%
Preston	98%	0%	0%	0%	2%
Salem	95%	0%	0%	2%	3%
Sprague	94%	0%	2%	0%	4%
Stonington	87%	1%	2%	2%	8%
Waterford	94%	1%	1%	1%	4%
Windham	85%	2%	8%	2%	4%
seCTer Region	88%	2%	5%	1%	4%
Connecticut	87%	5%	3%	1%	4%
US	86%	5%	3%	1%	4%

Notes: Workers age 16+ means of transportation to work 2010-2014 estimates
Public Transportation includes: bus, trolly, streetcar, subway, railroad, ferryboat
Other includes: taxicab, motocycle, and other means
*Town of Groton data excludes data from the City of Groton
Source: ESRI

Migration Patterns

According to data from the American Community Survey 2009-2013 5-year estimates data, there are more people moving to New London County from a different county, state, or country, than there are people moving out of New London County to a different county or state. The same is true for Windham County.

Table 12: Annual Migration, New London and Windham counties, 2013

Annual Migration, 2013		
Migration	New London County	Windham County
Total Population (1 yr. and over)	271,492	117,171
Movers from Different State	10,785	2,393
Movers to Different State	10,463	2,182
Movers from Different County, Same State	6,264	4,697
Movers to Different County, Same State	5,628	2,970
Movers from Abroad	1,438	428
Total Moving to Different County/State	16,091	5,152
Total Moving from Different County/State/Abroad	18,487	7,518

Source: American Community Survey 2009-2013

Total Inbound Migration Flows to New London County

The following map of the US designates New London County as a red dot, and shows the number of people migrating *to* New London County by county of origin. According to this map, a significant number of people are migrating to New London County from surrounding regions in Connecticut, New York, Vermont, New Hampshire, Massachusetts, and Pennsylvania. Other notable areas where people are migrating from include California, particularly the southern region, Florida, Central Washington, Hawaii, and Northern Maine.

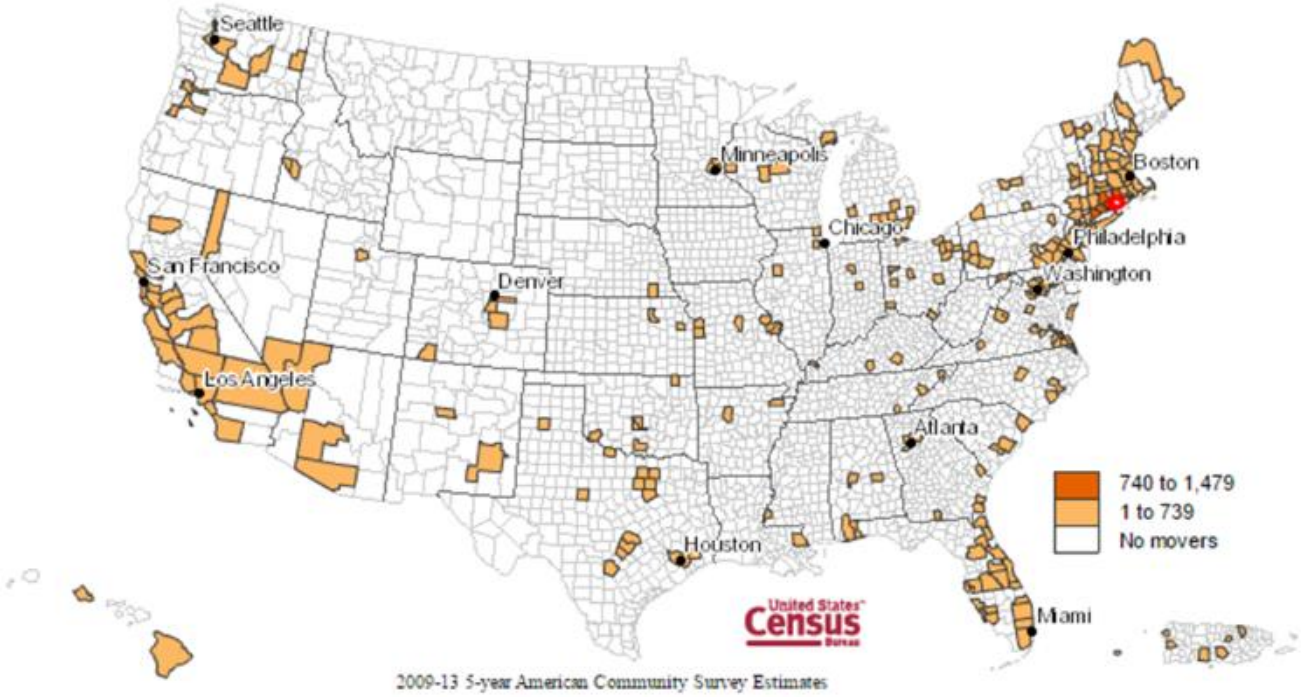


Figure 2: Total Inbound Migration Flows to New London County, 2013

Total Outbound Migration Flows from New London County

The following map of the US designates New London County as a red dot, and shows the number of people migrating *from* New London County by destination county. According to this map, a significant number of people are migrating from New London County to the surrounding regions in Connecticut, New York, Vermont, New Hampshire, Massachusetts, and Pennsylvania. This pattern is very similar to that of people migrating to New London County, as shown in the map above. Other notable areas where people are migrating to include Central and Southern California, Florida, Washington, and Maine. Again, this pattern is similar to that of people migrating to New London County.

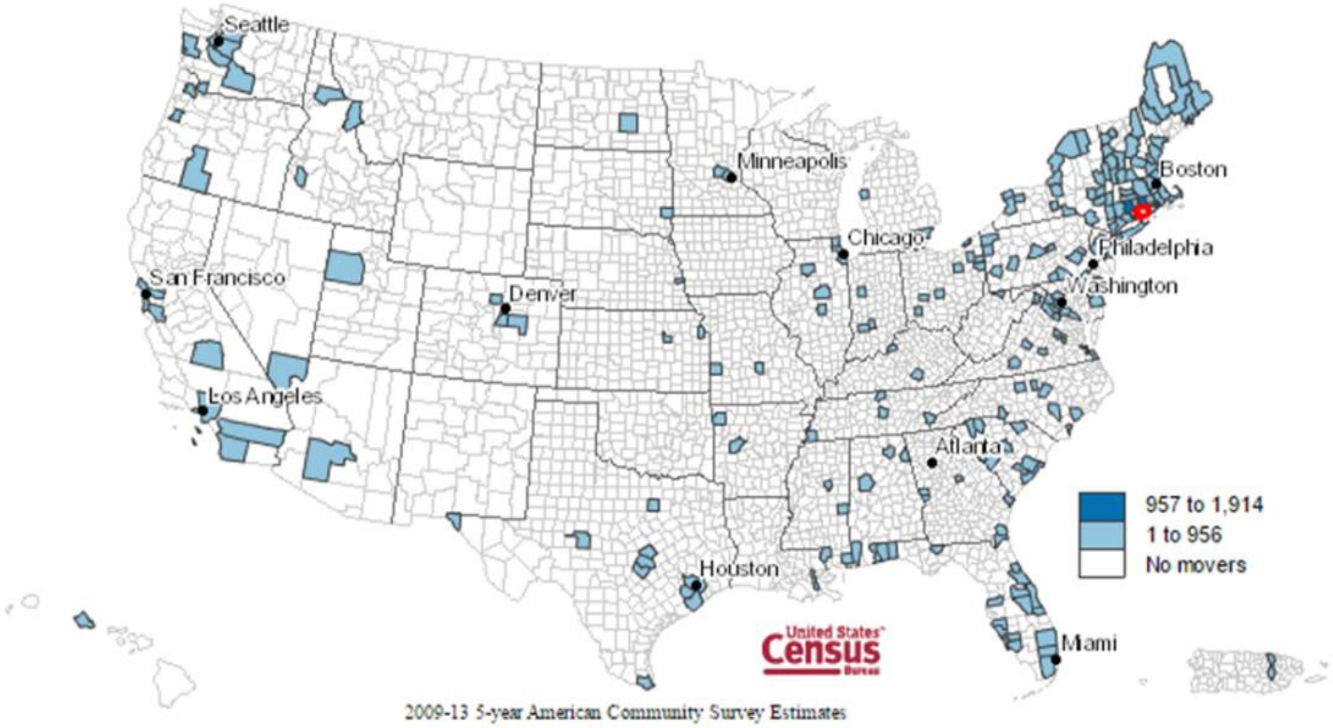
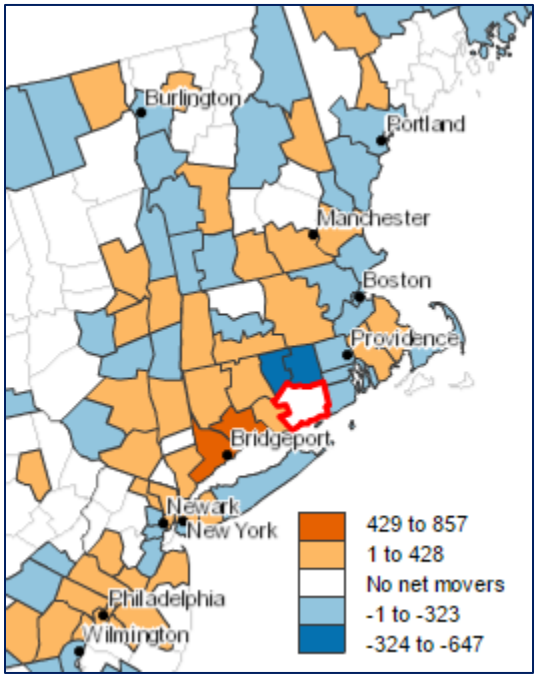


Figure 3: Total Outbound Migration Flows from New London County, 2013

Total Inbound and Outbound Migration Flows for New London County

The following maps shows net migration flows to and from New London County. Counties in orange are net losers of population *to* New London County. In other words, counties in orange lose more residents to New London County than they gain. Conversely, counties in blue are net gainers of population from New London County. Nationally, California and Central Florida are significant points of origin for movers to New London County, while South Florida, Northern Maine, and Upstate New York are popular destinations for those moving out of the county.

Within Connecticut, New London County gains a significant number of residents from Fairfield and New Haven counties and loses population to Tolland and Windham counties. New London County also loses population to Rhode Island and the Boston metro.



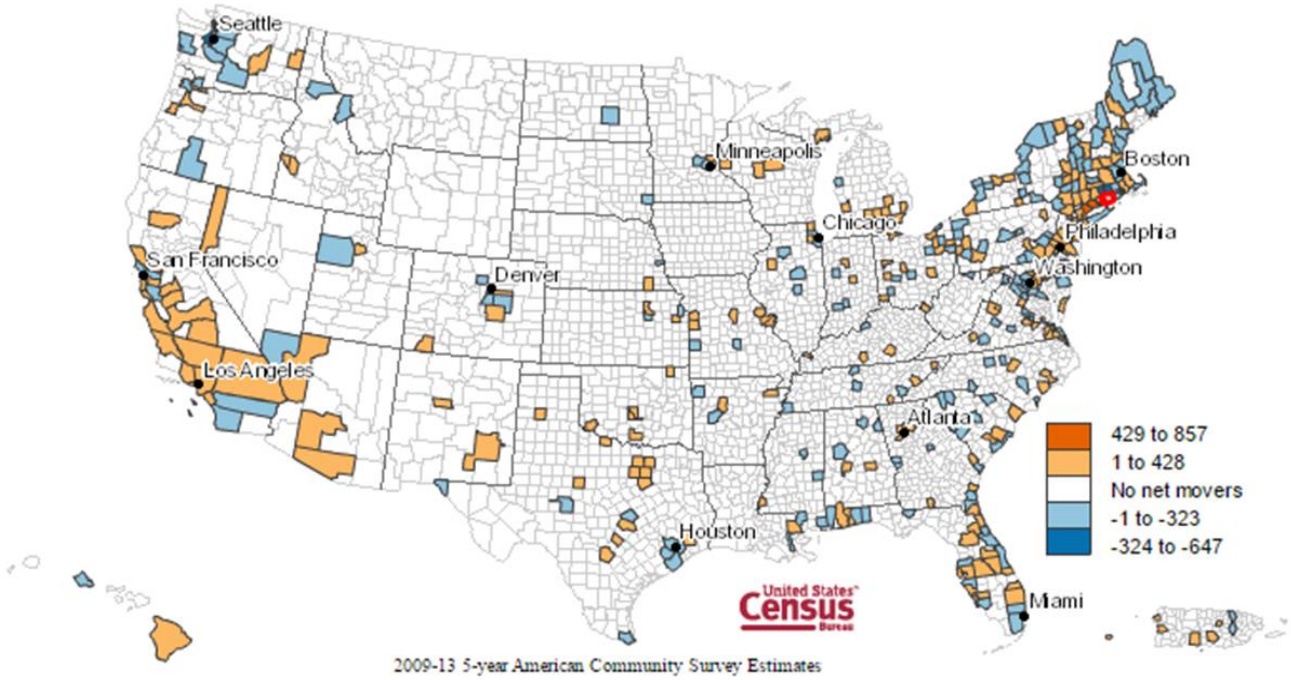


Figure 4: Net Migration Flows to/from New London County, 2013

Commutation Patterns

Commuter Inflow and Outflow

The two tables below show the inflow and outflow of commuters in 2004 and 2014. The table shows workers employed in the seCTer region as well as workers living in the seCTer region. Some key takeaways from these tables include:

- The share of the region's workers commuting from outside the region increased by 4 percentage points between 2004 and 2014 to 36%.
- The share of the region's residents commuting to jobs outside the region also increased, by 6 percentage points.
- This points to increased cross-commuting with surrounding regions.

Table 13: Commuter Inflow/Outflow, seCTer Region, 2004-2014

Commuter Inflow/Outflow				
	2004 Count	2004 Share	2014 Count	2014 Share
Employed in seCTer Region	111,353	100%	115,943	100%
Employed in seCTer Region but Living Outside	35,861	32%	41,677	36%
Employed and Living in seCTer Region	75,492	68%	74,266	64%
Living in seCTer Region	109,226	100%	117,489	100%
Living in seCTer Region but Employed Outside	33,734	31%	43,223	37%
Living and Employed in seCTer Region	75,492	69%	74,266	63%

Note: Job Counts include only primary jobs
Source: Census On-The-Map

Workforce Profile

Key Findings

Workforce

- Females as a proportion of the region's workforce fell slightly from 47% in 2009 to 46% in 2014. Industry sectors heavily dominated by male workers in the region (>85%) include Construction, Mining, Utilities, and Manufacturing. The Health Care sector employs the highest share of females, 79%.
- Industries including Mining, Quarrying, and Oil and Gas Extraction, as well as Utilities, and Construction are heavily dominated by males, all three of which have at least 87% males in the industry. There are no industries dominated by female workers to that degree, however Management of Companies and Enterprises, as well as Health Care and Social Assistance have a high majority of females at 76% and 79%, respectively.
- Between 2009 and 2014, the 55+ age cohorts grew as a proportion of the workforce, growing from 19% to 22%. Older workers (ages 55+) account for a disproportionately large share of the Utilities and Manufacturing sectors, while younger workers (age 14-24) are disproportionately represented in Accommodation and Food Services.
- As a proportion of the seCTer region's workforce, non-Hispanic whites shrank from 80% to 75% between 2009 and 2014. While comprising 9% of New London County's workforce overall, Hispanics are disproportionately represented in Crop and Animal Production and Accommodation and Food Services. Both Hispanics and African Americans are disproportionately represented in Administrative and Support and Waste Management, Transportation and Warehousing, and Government.

Occupations

- Within the seCTer region, the largest occupations in 2015 included Office and Administrative Support Occupations with nearly 19,000 jobs, followed by Food Preparation and Serving Related Occupations and Sales and Related Occupations, both with nearly 13,000 jobs.
- Healthcare Support Occupations and Community and Social Service Occupations are projected to grow by 5% over the next 5-year period, which shows the most growth out of all occupations.
- Computer and Mathematical Occupations as well as Life, Physical, and Social Science Occupations are projected to decline the most at 15% and 20%, respectively, representing that largest decline in all industries
- Of the region's top 25 largest occupations, two have national location quotients over 2.00: military occupations (3.54) and police patrol officers (2.61).

Educational Requirements and Programs

- Of the region's top 25 occupations, 17 require a high school diploma or less. Four require a bachelor's degree or higher.
- Region-wide, educational institutions awarded 3,279 degrees and certificates in 2014. Of these, 2,060 were bachelor's degrees. Eastern Connecticut State University accounted for 35% of all awards, the most of any institution.

Unemployment

- The 2015 unemployment rate for the seCTer region was 6%, which is higher than that of Connecticut at 5.6% and the US at 5.3%.
- In 2015, the labor force participation rate for New London County was nearly 66.9%, about the same as for Connecticut (66.7%), and several percentage points higher than for the US (63.1%).

Workers by Gender

Females as a proportion of the region's workforce fell slightly from 47% in 2009 to 46% in 2014.

Table 14: Workers by Gender, seCTer Region, 2009-2014

Workers by Gender, 2009-2014 seCTer Region		
	2009	2014
Females	47%	46%
Males	53%	54%
Total	100%	100%

Note: Includes workers employed within the seCTer region

Source: ACS American FactFinder

Industry sectors heavily dominated by male workers in the region (>85%) include Construction, Mining, Utilities, and Manufacturing. Females make up a majority of workers in the following sectors: Health Care, Management of Companies and Enterprises, Finance and Insurance, Educational Services, and Accommodation and Food Services.

Table 15: Workers by Gender by 2-digit NAICS, New London County, 2015

New London County					
Workers by Gender, 2015					
NAICS (2-digit)	Description	Females	Females % of Industry	Males	Males % of Industry
11	Crop and Animal Production	667	41%	967	59%
21	Mining, Quarrying, and Oil and Gas Extraction	<10	Insf. Data	71	88%
22	Utilities	155	13%	1,051	87%
23	Construction	587	10%	5,036	90%
31	Manufacturing	3,394	21%	12,627	79%
42	Wholesale Trade	873	29%	2,107	71%
44	Retail Trade	7,678	51%	7,368	49%
48	Transportation and Warehousing	1,042	32%	2,256	68%
51	Information	506	45%	610	55%
52	Finance and Insurance	1,349	66%	681	34%
53	Real Estate and Rental and Leasing	581	43%	771	57%
54	Professional, Scientific, and Technical Services	2,508	43%	3,307	57%
55	Management of Companies and Enterprises	655	76%	210	24%
56	Administrative and Support and Waste Management	1,099	35%	2,007	65%
61	Educational Services	1,684	61%	1,087	39%
62	Health Care and Social Assistance	14,306	79%	3,700	21%
71	Arts, Entertainment, and Recreation	1,167	48%	1,281	52%
72	Accommodation and Food Services	7,336	57%	5,462	43%
81	Other Services (except Public Administration)	3,347	60%	2,213	40%
90	Government	15,442	41%	21,784	59%
99	Unclassified Industry	13	52%	12	48%
	Total	64,398	46%	74,606	54%

Source: EMSI

Workers by Age

Between 2009 and 2014, the 55+ age cohorts grew as a proportion of the workforce, growing from 19% to 22%. Older workers (ages 55+) accounted for a disproportionately large share of the Utilities and Manufacturing sectors. They represent 44% of all Utilities workers, and 33% of all Manufacturing workers, though they make up only 22% of the overall workforce. Younger workers are disproportionately represented in Accommodation and Food Services, where they comprise 32% of the industry's workers versus 14% of the workforce overall.

Table 16: Workers by Age, seCTer Region, 2009-2014

Workers by Age, 2009-2014 seCTer Region		
Age	2009	2014
16-19	5%	4%
20-24	11%	11%
25-44	41%	38%
45-54	25%	24%
55-59	9%	10%
60-64	6%	7%
65+	4%	5%
Total	100%	100%

Note: Includes workers employed within the seCTer region
Workers from Salem town are excluded from the totals due to lack of data availability
Source: ACS American FactFinder

Table 17: Workers by Age by 2-digit NAICS, New London County, 2015

New London County							
Age of Workers, 2015							
NAICS (2-digit)	Description	Age 14-24	Age 25-34	Age 35-44	Age 45-54	Age 55-64	Age 65+
11	Crop and Animal Production	151	322	253	471	311	127
21	Mining, Quarrying, and Oil and Gas Extraction	0	<10	14	26	19	13
22	Utilities	11	119	158	383	477	48
23	Construction	367	993	1,200	1,764	1,010	288
31	Manufacturing	839	3,196	2,298	4,328	4,480	881
42	Wholesale Trade	158	499	672	916	580	154
44	Retail Trade	3,891	3,127	2,162	2,682	2,216	967
48	Transportation and Warehousing	205	553	671	896	674	299
51	Information	125	171	242	302	221	53
52	Finance and Insurance	126	363	394	585	428	135
53	Real Estate and Rental and Leasing	65	187	225	367	301	203
54	Professional, Scientific, and Technical Services	251	857	1,236	1,733	1,269	469
55	Management of Companies and Enterprises	70	236	170	194	138	50
56	Administrative and Support and Waste Management	337	625	642	787	513	204
61	Educational Services	257	503	541	625	606	239
62	Health Care and Social Assistance	1,631	3,679	3,690	4,272	3,579	1,155
71	Arts, Entertainment, and Recreation	449	489	421	460	380	250
72	Accommodation and Food Services	4,054	3,397	2,077	1,762	1,026	482
81	Other Services (except Public Administration)	591	1,005	955	1,348	1,097	563
90	Government	5,897	7,217	7,650	8,840	5,439	2,182
99	Unclassified Industry	0	<10	<10	<10	<10	<10
	Total	19,498	27,549	25,678	32,746	24,769	8,764

Source: EMSI

Table 18: Workers by Age by 2-digit NAICS, New London County, 2015 (Percent Distribution)

New London County							
Age of Workers (%), 2015							
NAICS (2-digit)	Description	Age 14-24 % of Industry	Age 25-34 % of Industry	Age 35-44 % of Industry	Age 45-54 % of Industry	Age 55-64 % of Industry	Age 65+ % of Industry
11	Crop and Animal Production	9%	20%	15%	29%	19%	8%
21	Mining, Quarrying, and Oil and Gas Extraction	0%	Insf. Data	17%	32%	23%	16%
22	Utilities	1%	10%	13%	32%	40%	4%
23	Construction	7%	18%	21%	31%	18%	5%
31	Manufacturing	5%	20%	14%	27%	28%	5%
42	Wholesale Trade	5%	17%	23%	31%	19%	5%
44	Retail Trade	26%	21%	14%	18%	15%	6%
48	Transportation and Warehousing	6%	17%	20%	27%	20%	9%
51	Information	11%	15%	22%	27%	20%	5%
52	Finance and Insurance	6%	18%	19%	29%	21%	7%
53	Real Estate and Rental and Leasing	5%	14%	17%	27%	22%	15%
54	Professional, Scientific, and Technical Services	4%	15%	21%	30%	22%	8%
55	Management of Companies and Enterprises	8%	27%	20%	22%	16%	6%
56	Administrative and Support and Waste Management	11%	20%	21%	25%	17%	7%
61	Educational Services	9%	18%	20%	23%	22%	9%
62	Health Care and Social Assistance	9%	20%	20%	24%	20%	6%
71	Arts, Entertainment, and Recreation	18%	20%	17%	19%	16%	10%
72	Accommodation and Food Services	32%	27%	16%	14%	8%	4%
81	Other Services (except Public Administration)	11%	18%	17%	24%	20%	10%
90	Government	16%	19%	21%	24%	15%	6%
99	Unclassified Industry	0%	Insf. Data	Insf. Data	Insf. Data	Insf. Data	Insf. Data
	Average	14%	20%	18%	24%	18%	6%

Source: EMSI

Workers by Race/Ethnicity

As a proportion of the workforce, non-Hispanic whites shrank from 80% to 75% between 2009 and 2014.

Table 19: Workers by Race/Ethnicity, seCTer Region, 2009-2014

Workers by Race/Ethnicity, 2009-2014 seCTer Region		
	2009	2014
White Alone, Not Hispanic or Latino	80%	75%
Other Races/Ethnicities	20%	25%
Total	100%	100%

Note: Includes workers employed within the seCTer region
Workers from Salem town are excluded from the totals due to lack of data availability
Data for other races/ethnicities unavailable due to the low number of sample cases for individual municipalities
Source: ACS American FactFinder

While comprising 9% of New London County's workforce overall, Hispanics are disproportionately represented in Crop and Animal Production, where they make up 22% of workers. Other sectors where Hispanics account for a disproportionate share of the workforce include Administrative and Support and Waste Management (14%), Accommodation and Food Services (12%), Transportation and Warehousing (12%), and Government (12%). African Americans comprise 8% of New London County's workforce but make up 12% of the Government sector, 10% of the Administrative and Support and Waste Management sector and 10% of the Transportation and Warehousing sector.

Table 20: Workers by Race/Ethnicity by 2-digit NAICS, New London County, 2015

New London County								
Race/Ethnicity of Workers, 2015								
NAICS (2-digit)	Description	Non-Hispanic White	Hispanic or Latino	Non-Hispanic Black or African American	Non-Hispanic American Indian or Alaska Native	Non-Hispanic Asian	Non-Hispanic Native Hawaiian or Other Pacific Islander	Two or More Races
11	Crop and Animal Production	1,174	359	59	<10	31	<10	<10
21	Mining, Quarrying, and Oil and Gas Extraction	75	<10	<10	0	0	0	<10
22	Utilities	1,124	25	25	<10	20	<10	<10
23	Construction	4,873	484	156	18	28	<10	61
31	Manufacturing	14,047	749	533	28	519	<10	140
42	Wholesale Trade	2,610	185	91	<10	69	0	22
44	Retail Trade	11,693	1,576	1,084	41	424	14	213
48	Transportation and Warehousing	2,435	393	343	17	68	<10	41
51	Information	978	62	47	<10	11	0	13
52	Finance and Insurance	1,804	88	63	<10	54	<10	12
53	Real Estate and Rental and Leasing	1,139	98	64	<10	16	0	28
54	Professional, Scientific, and Technical Services	5,126	201	132	<10	300	<10	47
55	Management of Companies and Enterprises	722	75	42	<10	13	0	<10
56	Administrative and Support and Waste Management	2,225	432	325	10	57	<10	55
61	Educational Services	2,325	172	133	<10	90	<10	47
62	Health Care and Social Assistance	13,956	1,570	1,601	69	538	<10	263
71	Arts, Entertainment, and Recreation	2,182	114	74	13	30	<10	34
72	Accommodation and Food Services	9,298	1,575	944	81	619	21	260
81	Other Services (except Public Administration)	4,436	498	405	18	134	<10	68
90	Government	25,737	4,459	5,119	40	825	54	992
99	Unclassified Industry	19	<10	<10	0	<10	0	0
	Total	107,978	13,119	11,245	375	3,848	123	2,315

Source: EMSI

Table 21: Workers by Race/Ethnicity by 2-digit NAICS, New London County, 2015 (Percent Distribution)

New London County								
Race/Ethnicity of Workers (%), 2015								
NAICS (2-digit)	Description	Non-Hispanic White % of Industry	Hispanic or Latino % of Industry	Non-Hispanic Black or African American % of Industry	Non-Hispanic American Indian or Alaska Native % of Industry	Non-Hispanic Asian % of Industry	Non-Hispanic Native Hawaiian or Other Pacific Islander % of Industry	Two or More Races % of Industry
11	Crop and Animal Production	72%	22%	4%	Insf. Data	2%	Insf. Data	Insf. Data
21	Mining, Quarrying, and Oil and Gas Extraction	93%	Insf. Data	Insf. Data	0%	0%	0%	Insf. Data
22	Utilities	93%	2%	2%	Insf. Data	2%	Insf. Data	Insf. Data
23	Construction	87%	9%	3%	0%	0%	Insf. Data	1%
31	Manufacturing	88%	5%	3%	0%	3%	Insf. Data	1%
42	Wholesale Trade	88%	6%	3%	Insf. Data	2%	0%	1%
44	Retail Trade	78%	10%	7%	0%	3%	0%	1%
48	Transportation and Warehousing	74%	12%	10%	1%	2%	Insf. Data	1%
51	Information	88%	6%	4%	Insf. Data	1%	0%	1%
52	Finance and Insurance	89%	4%	3%	Insf. Data	3%	Insf. Data	1%
53	Real Estate and Rental and Leasing	84%	7%	5%	Insf. Data	1%	0%	2%
54	Professional, Scientific, and Technical Services	88%	3%	2%	Insf. Data	5%	Insf. Data	1%
55	Management of Companies and Enterprises	83%	9%	5%	Insf. Data	2%	0%	Insf. Data
56	Administrative and Support and Waste Management	72%	14%	10%	0%	2%	Insf. Data	2%
61	Educational Services	84%	6%	5%	Insf. Data	3%	Insf. Data	2%
62	Health Care and Social Assistance	78%	9%	9%	0%	3%	Insf. Data	1%
71	Arts, Entertainment, and Recreation	89%	5%	3%	1%	1%	Insf. Data	1%
72	Accommodation and Food Services	73%	12%	7%	1%	5%	0%	2%
81	Other Services (except Public Administration)	80%	9%	7%	0%	2%	Insf. Data	1%
90	Government	69%	12%	14%	0%	2%	0%	3%
99	Unclassified Industry	76%	Insf. Data	Insf. Data	0%	Insf. Data	0%	0%
	Total	78%	9%	8%	0%	3%	0%	2%

Source: EMSI

Workers by 2-digit NAICS Industry

The following table summarizes the 2-digit NAICS industries within which the region's workforce is employed.

Table 22: Workers by 2-digit NAICS Industry, 2004-2014

All Industries - seCTer Region					
NAICS (2-digit)	Description	2004 Jobs	2014 Jobs	2004 - 2014 Change	2004 - 2014 % Change
11	Crop and Animal Production	1,466	1,172	(294)	(20%)
21	Mining, Quarrying, and Oil and Gas Extraction	58	64	6	10%
22	Utilities	1,437	1,263	(174)	(12%)
23	Construction	4,148	3,698	(450)	(11%)
31	Manufacturing	17,703	14,991	(2,712)	(15%)
42	Wholesale Trade	1,796	2,671	875	49%
44	Retail Trade	15,430	15,540	110	1%
48	Transportation and Warehousing	2,730	3,311	581	21%
51	Information	2,192	1,320	(872)	(40%)
52	Finance and Insurance	2,250	2,005	(245)	(11%)
53	Real Estate and Rental and Leasing	939	862	(77)	(8%)
54	Professional, Scientific, and Technical Services	5,650	5,100	(550)	(10%)
55	Management of Companies and Enterprises	662	815	153	23%
56	Administrative and Support and Waste Management	3,368	2,897	(471)	(14%)
61	Educational Services	3,006	2,654	(352)	(12%)
62	Health Care and Social Assistance	16,691	20,139	3,448	21%
71	Arts, Entertainment, and Recreation	1,903	1,846	(57)	(3%)
72	Accommodation and Food Services	10,056	12,412	2,356	23%
81	Other Services (except Public Administration)	4,488	4,651	163	4%
90	Government	48,236	40,182	(8,054)	(17%)
99	Unclassified Industry	13	33	20	154%
	Total	144,222	137,623	(6,599)	(5%)

Source: EMSI

Occupations

Within the seCTer region, the largest occupations in 2015 included Office and Administrative Support Occupations with nearly 19,000 jobs, followed by Food Preparation and Serving Related Occupations and Sales and Related Occupations, both with nearly 13,000 jobs. The occupations with the least number of jobs were Arts, Design, Entertainment, Sports, and Media Occupations, Life, Physical, and Social Science Occupations, Legal Occupations, Farming, Fishing, and Forestry Occupations, all of which have less than 2,000 jobs.

Healthcare Support Occupations and Community and Social Service Occupations are projected to grow by 5% over the next 5-year period, which shows the most growth out of all occupations. Computer and Mathematical Occupations as well as Life, Physical, and Social Science Occupations are projected to decline the most at 15% and 20%, respectively, representing that largest decline in all industries.

Table 23: Occupations by 2-digit SOC, seCTer Region, 2010, 2015, 2020

All Occupations - seCTer Region										
SOC (2-digit)	Description	2010 Jobs	2015 Jobs	2020 Jobs	2010 - 2015 Change	2010 - 2015 % Change	2015 - 2021 Change	2015 - 2021 % Change	2015 Median Hourly Earnings	2015 Location Quotient
11-0000	Management Occupations	8,972	8,987	8,708	15	0%	(282)	(3%)	$45.07	1.12
13-0000	Business and Financial Operations Occupations	5,558	5,458	5,342	(100)	(2%)	(117)	(2%)	$30.59	0.74
15-0000	Computer and Mathematical Occupations	2,662	2,526	2,163	(136)	(5%)	(370)	(15%)	$35.84	0.62
17-0000	Architecture and Engineering Occupations	3,874	3,753	3,521	(121)	(3%)	(258)	(7%)	$38.04	1.53
19-0000	Life, Physical, and Social Science Occupations	1,980	1,632	1,328	(348)	(18%)	(329)	(20%)	$39.37	1.38
21-0000	Community and Social Service Occupations	3,809	3,750	3,896	(59)	(2%)	169	5%	$22.27	1.57
23-0000	Legal Occupations	1,399	1,274	1,212	(125)	(9%)	(67)	(5%)	$40.99	1.04
25-0000	Education, Training, and Library Occupations	9,741	9,329	9,193	(412)	(4%)	(122)	(1%)	$25.41	1.11
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	2,029	1,914	1,848	(115)	(6%)	(69)	(4%)	$19.81	0.74
29-0000	Healthcare Practitioners and Technical Occupations	8,291	8,105	8,390	(186)	(2%)	346	4%	$38.34	1.02
31-0000	Healthcare Support Occupations	3,871	3,836	4,001	(35)	(1%)	199	5%	$15.04	0.94
33-0000	Protective Service Occupations	7,314	5,855	5,483	(1,459)	(20%)	(400)	(7%)	$25.10	1.77
35-0000	Food Preparation and Serving Related Occupations	11,995	12,951	13,502	956	8%	576	4%	$10.57	1.06
37-0000	Building and Grounds Cleaning and Maintenance Occupations	5,036	5,009	4,923	(27)	(1%)	(71)	(1%)	$12.51	0.90
39-0000	Personal Care and Service Occupations	6,893	7,127	7,353	234	3%	281	4%	$12.16	1.20
41-0000	Sales and Related Occupations	12,641	12,946	12,858	305	2%	(43)	(0%)	$14.66	0.87
43-0000	Office and Administrative Support Occupations	20,210	18,834	18,162	(1,376)	(7%)	(718)	(4%)	$17.54	0.85
45-0000	Farming, Fishing, and Forestry Occupations	871	912	853	41	5%	(64)	(7%)	$14.14	0.81
47-0000	Construction and Extraction Occupations	6,762	6,763	6,891	1	0%	161	2%	$22.20	1.03
49-0000	Installation, Maintenance, and Repair Occupations	4,953	4,727	4,674	(226)	(5%)	(48)	(1%)	$21.50	0.84
51-0000	Production Occupations	8,312	8,311	8,441	(1)	(0%)	117	1%	$19.43	0.94
53-0000	Transportation and Material Moving Occupations	7,218	6,849	6,823	(369)	(5%)	(19)	(0%)	$16.17	0.71
55-0000	Military occupations	7,724	6,727	6,696	(997)	(13%)	(31)	(0%)	$18.75	3.52
99-0000	Unclassified Occupation	0	0	0	0	0%	0	0%	$0.00	0.00
	Total	152,111	147,575	146,258	(4,536)	(3%)	(1,158)	(1%)		

Source: EMSI

Table 24: National Location Quotient, Top 25 Occupations, seCTer Region, 2016

National Location Quotient for Top 25 Occupations seCTer Region					
SOC (5-digit)	Description	2015 Jobs in seCTer Region	seCTer	CT	US
55-9999	Military occupations	6,729	3.54	0.58	1.00
41-2031	Retail Salespersons	4,492	1.05	0.95	1.00
41-2011	Cashiers	3,370	1.02	0.93	1.00
35-3031	Waiters and Waitresses	2,734	1.15	0.92	1.00
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	2,607	0.85	0.76	1.00
29-1141	Registered Nurses	2,455	0.94	0.99	1.00
43-9061	Office Clerks, General	2,448	0.79	0.95	1.00
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	2,320	0.92	1.15	1.00
11-1021	General and Operations Managers	2,172	1.06	1.31	1.00
39-9021	Personal Care Aides	1,961	1.21	1.35	1.00
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	1,849	0.82	1.13	1.00
43-5081	Stock Clerks and Order Fillers	1,842	1.01	0.98	1.00
31-1014	Nursing Assistants	1,692	1.24	1.29	1.00
33-3051	Police and Sheriff's Patrol Officers	1,677	2.61	0.88	1.00
43-1011	First-Line Supervisors of Office and Administrative Support Workers	1,646	1.20	1.46	1.00
25-9041	Teacher Assistants	1,628	1.34	1.42	1.00
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	1,538	0.65	0.77	1.00
35-2014	Cooks, Restaurant	1,343	1.22	0.96	1.00
43-4051	Customer Service Representatives	1,343	0.54	0.90	1.00
41-1011	First-Line Supervisors of Retail Sales Workers	1,331	1.19	1.05	1.00
25-2021	Elementary School Teachers, Except Special Education	1,296	1.00	1.07	1.00
43-3031	Bookkeeping, Accounting, and Auditing Clerks	1,242	0.78	0.98	1.00
25-1099	Postsecondary Teachers	1,224	0.88	1.26	1.00
37-2012	Maids and Housekeeping Cleaners	1,049	1.06	1.00	1.00
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	996	1.11	1.19	1.00
		52,984			

Source: EMSI

Educational Requirements

The following table shows the educational requirements for the region's top 25 occupations by 5-digit SOC.

Table 25: Educational Requirements, Top 25 Occupations, seCTer Region, 2016

Overall Top 25 Occupations - seCTer Region							
SOC (5-digit)	Description	2016 Employed	2021 Employed	2016 - 2021 Change	2016 - 2021 % Change	2016 Median Hourly Earnings	Typical Entry Level Education
55-9999	Military occupations	6,694	6,696	2	0%	18.75	N/A
41-2031	Retail Salespersons	4,721	4,916	195	4%	10.83	No formal educational credential
41-2011	Cashiers	3,420	3,433	13	0%	9.98	No formal educational credential
35-3031	Waiters and Waitresses	2,893	2,976	83	3%	9.36	No formal educational credential
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	2,599	2,764	165	6%	9.98	No formal educational credential
29-1141	Registered Nurses	2,515	2,594	79	3%	34.88	Bachelor's degree
43-9061	Office Clerks, General	2,449	2,415	(34)	(1%)	15.69	High school diploma or equivalent
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	2,313	2,274	(39)	(2%)	17.88	High school diploma or equivalent
11-1021	General and Operations Managers	2,195	2,193	(2)	(0%)	50.21	Bachelor's degree
39-9021	Personal Care Aides	2,143	2,461	318	15%	12.00	No formal educational credential
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	1,943	1,944	1	0%	12.76	No formal educational credential
43-5081	Stock Clerks and Order Fillers	1,880	1,933	53	3%	11.15	No formal educational credential
31-1014	Nursing Assistants	1,725	1,744	19	1%	14.07	Postsecondary nondegree award
33-3051	Police and Sheriff's Patrol Officers	1,669	1,621	(48)	(3%)	29.23	High school diploma or equivalent
43-1011	First-Line Supervisors of Office and Administrative Support Workers	1,660	1,647	(13)	(1%)	25.66	High school diploma or equivalent
25-9041	Teacher Assistants	1,626	1,629	3	0%	13.69	Some college, no degree
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	1,612	1,645	33	2%	13.83	No formal educational credential
41-1011	First-Line Supervisors of Retail Sales Workers	1,509	1,517	8	1%	18.23	High school diploma or equivalent
35-2014	Cooks, Restaurant	1,444	1,554	110	8%	11.99	No formal educational credential
37-2012	Maids and Housekeeping Cleaners	1,372	1,399	27	2%	10.04	No formal educational credential
43-4051	Customer Service Representatives	1,360	1,333	(27)	(2%)	16.33	High school diploma or equivalent
25-2021	Elementary School Teachers, Except Special Education	1,310	1,300	(10)	(1%)	33.38	Bachelor's degree
43-3031	Bookkeeping, Accounting, and Auditing Clerks	1,278	1,208	(70)	(5%)	18.73	Some college, no degree
25-1099	Postsecondary Teachers	1,232	1,249	17	1%	29.67	Doctoral or professional degree
37-3011	Landscaping and Groundskeeping Workers	1,184	1,199	15	1%	12.55	No formal educational credential
	Total	54,747	55,642	895	2%		

Source: EMSI

As summarized in the next table, 17 of these occupations require a high school diploma or less. Four require a bachelor's degree or higher. More of the region's top occupations require a higher level of education as compared to educational requirements for top occupations in Connecticut and the US.

Table 26: Educational Requirements, Top 25 Occupations, seCTer Region, CT, US, 2016

Top 25 Occupations Education Requirements Summary			
Requirement	seCTer Region Number of Occupations	CT Number of Occupations	US Number of Occupations
No Formal Education	11	13	13
High School Diploma or Equivalent	6	6	6
Postsecondary Nondegree Award	1	3	3
Some College No Degree	2	0	0
Bachelor's Degree	3	2	2
Graduate Degree or Higher	1	0	0

Source: EMSI

Educational Institutions and Programs

The following table shows the seCTer region's educational institutions and awarded degrees for all institutions that are part of the Intregrated Postsecondary Education Data System (IPEDS) program.[1]

Table 27: Educational Institutions and Awarded Degrees, seCTer Region, 2014

Educational Institutions and Awarded Degrees, 2014 seCTer Region					
Institution	Associate's Degree	Bachelor's Degree	All Certificates	Graduate Degree	All Completions*
Eastern Connecticut State University	8	1,109	0	59	1,176
Three Rivers Community College	537	0	95	0	632
Connecticut College	0	579	0	0	582
Marinello Schools of Beauty-Niantic	0	0	236	0	236
United States Coast Guard Academy	0	221	0	0	221
Mitchell College	19	151	0	0	170
Ridley-Lowell Business & Technical Institute-New London	0	0	147	0	147
Connecticut Center for Massage Therapy-Groton	0	0	64	0	64
Norwich Technical High School/Adult Licensed Practical Nurse Program	0	0	31	0	31
Windham Technical High School	0	0	13	0	13
Windham Memorial Hospital-Radiologic Technology Program	0	0	7	0	7
Total	564	2,060	593	59	3,279

* All completions include Associate's Degrees, Bachelor's Degrees, Certificates, as well as "award of less than 1 academic year", "award of at least 1 but less than 2 academic years", and "award of at least 2 but less than 4 academic years"

Note: Graduate degrees include Master's and Doctor's

Source: EMSI

[1] IPEDS was developed by the US Department of Education's National Center for Education and collects data from every college, university, and technical and vocational institution that participates in federal student financial aid programs. IPEDS is not comprehensive of all education and training programs.

Unemployment

The 2015 unemployment rate for the seCTer region was 6%, which is higher than that of Connecticut at 5.6% and the US at 5.3%. The municipalities with the highest rates of unemployment include New London, Norwich, and Windham, all with at least 7.0% unemployment.

Table 28: Unemployment Rate by Municipality, 2015

seCTer Region Unemployment, 2015			
Region	Unemployment Rate	Number of Unemployed	Labor Force
Bozrah	5.3%	77	1,443
Colchester	4.4%	416	9,356
East Lyme	5.2%	446	8,613
Franklin	5.3%	57	1,080
Griswold	6.9%	435	6,317
Lebanon	4.8%	195	4,079
Ledyard	4.9%	391	7,946
Lisbon	5.9%	139	2,338
Montville	6.1%	578	9,404
New London	8.3%	997	12,055
North Stonington	4.8%	138	2,892
Norwich	7.2%	1,472	20,361
Preston	5.5%	133	2,418
Salem	5.4%	113	2,112
Sprague	6.6%	108	1,626
Stonington	4.9%	460	9,549
Town of Groton*	5.2%	968	18,494
Waterford	5.1%	512	10,116
Windham	7.0%	870	12,481
seCTer Region	6.0%	8,505	142,680
Connecticut	5.6%		
US	5.3%		

*Town of Groton **includes** City of Groton

Source: Connecticut Department of Labor, American Community Survey

Table 29: Labor Force Participation Rate, New London and Windham counties, CT, US, 2015

Labor Force Participation, 2015	
Region	Labor Force Participation Rate
New London County	66.9%
Windham County	67.2%
Connecticut	66.7%
US	63.1%

Source: American Community Survey

Innovation Profile

The following tables compare seCTer to peer regions on a number of innovation-related indicators. The three peer regions include: 1) Hartford (CT) MSA, comprised of Hartford, Tolland and Middlesex counties, 2) Springfield (MA) MSA, comprised of Hampshire and Hampden counties, and 3) Worcester (MA-CT) MSA, comprised of Worcester County, MA, and Windham County, CT.

Key Findings

- The seCTer region ranks behind the Hartford MSA, but ahead of the Worcester and Springfield MSAs, in terms of share of the population with advanced degrees. Fourteen percent (14%) of seCTer's population has a graduate degree or higher, compared to 16% in the Hartford MSA.
- The number of new business establishments each year in New London County remained fairly consistent between 2010 and 2014, with the county adding between 400 and 450 new establishments annually. New London County was second only to the Hartford MSA in 2014 in terms of new establishments per capita.
- seCTer ranked behind Hartford, but ahead of Worcester and Springfield in terms of STEM jobs as a percent of all jobs. About 5.3% of seCTer's jobs are STEM occupations, compared to 5.6% in Hartford, 5.1% in Worcester, and 4.1% in Springfield.
- Engineers are among the most well-represent STEM occupations in the region, in terms of both number of jobs and national location quotient. The region is also strong in life and physical science occupations.
- Ten SBIR/STTR grants were awarded to the companies in the seCTer region in 2015, totaling almost $8 million. The seCTer region. On a dollar amount awarded per capita basis, seCTer exceeded all peer regions and Connecticut overall by more than double.
- There were 2 venture capital investment deals totaling $4.3 million in New London County in 2015. On a per capita basis, this is below Hartford MSA, Worcester MSA, and Connecticut as a whole.

Table 30: Population with Advanced Degrees, Regional Comparison, 2015

Share of Population with Advanced Degrees, 2015		
Region	Population	% of Population
seCTer Region	39,786	14%
Hartford, CT MSA	132,023	16%
Springfield, MA MSA	51,514	12%
Worcester, MA-CT MSA	81,280	13%
Connecticut	398,950	16%
US	23,208,443	11%

Note: Advanced Degrees include Graduate Degrees or higher

Sources: ESRI and EMSI

Table 31: Establishment Entry, New London County, 2010-2014

Establishment Entry New London County	
Year	Establishments
2014	443
2013	420
2012	439
2011	406
2010	427

Source: Longitudinal Business Database 1977-2014

Table 32: New Establishments per Capita, Regional Comparison, 2014

New Establishments per Capita, 2014			
Region	Establishments	Population	Establishments per 1,000 Population
New London County	443	274,071	1.62
Hartford, CT MSA	2,124	1,213,202	1.75
Springfield, MA MSA	1,008	630,709	1.60
Worcester, MA-CT MSA	1,357	931,816	1.46

Source: US Census, Longitudinal Business Database 1977-2014

Table 33: STEM Occupation Jobs, Regional Comparison, 2015

STEM Occupations - Jobs, 2015					
SOC (3-digit)	Description	seCTer Region	Hartford, CT MSA	Springfield, MA MSA	Worcester, MA-CT MSA
15-1100	Computer Occupations	2,435	18,157	5,050	9,365
15-2000	Mathematical Science Occupations	90	1,463	438	570
17-2000	Engineers	2,529	10,158	2,562	4,753
17-3000	Drafters, Engineering Technicians, and Mapping Technicians	1,080	3,319	1,059	1,960
19-1000	Life Scientists	486	1,265	867	1,511
19-2000	Physical Scientists	350	892	400	678
19-3000	Social Scientists and Related Workers	378	1,576	1,245	1,183
19-4000	Life, Physical, and Social Science Technicians	418	894	782	1,100
	Total STEM Jobs	7,766	37,723	12,403	21,119
	STEM Jobs as Percent of Total Jobs	5.3%	5.6%	4.1%	5.1%

Source: EMSI

Table 34: STEM Occupation Average Hourly Earnings, Regional Comparison, 2015

STEM Occupations - Average Earnings, 2015					
SOC (3-digit)	Description	seCTer Region	Hartford, CT MSA	Springfield, MA MSA	Worcester, MA-CT MSA
15-1100	Computer Occupations	$36.69	$38.48	$38.57	$39.83
15-2000	Mathematical Science Occupations	$45.06	$49.57	$40.42	$37.95
17-2000	Engineers	$43.06	$42.18	$41.76	$42.23
17-3000	Drafters, Engineering Technicians, and Mapping Technicians	$29.01	$28.98	$26.63	$26.86
19-1000	Life Scientists	$55.31	$49.04	$38.08	$37.88
19-2000	Physical Scientists	$40.83	$38.76	$36.60	$36.22
19-3000	Social Scientists and Related Workers	$36.72	$39.81	$33.15	$34.44
19-4000	Life, Physical, and Social Science Technicians	$27.64	$24.33	$24.45	$23.37
	Average Earnings	$38.66	$39.15	$36.74	$37.70

Source: EMSI

Table 35: STEM Occupation Location Quotients, Regional Comparison, 2015

STEM Occupations - Location Quotient, 2015					
SOC (3-digit)	Description	seCTer Region	Hartford, CT MSA	Springfield, MA MSA	Worcester, MA-CT MSA
15-1100	Computer Occupations	0.63	1.03	0.64	0.85
15-2000	Mathematical Science Occupations	0.59	2.10	1.40	1.31
17-2000	Engineers	1.60	1.42	0.80	1.06
17-3000	Drafters, Engineering Technicians, and Mapping Technicians	1.59	1.08	0.76	1.02
19-1000	Life Scientists	1.75	1.00	1.53	1.92
19-2000	Physical Scientists	1.33	0.75	0.75	0.91
19-3000	Social Scientists and Related Workers	1.31	1.21	2.12	1.45
19-4000	Life, Physical, and Social Science Technicians	1.19	0.56	1.09	1.11

Source: EMSI

Research and Development

SBIR/STTR: The 11 Federal agencies with extramural research and development budgets that exceed $100 million are required to allocate 2.8% of their R&D budget to the Small Business Innovation Research and Small Business Technology Transfer programs. Typically, there is at least one solicitation per year per agency. Technical topics of interest to the agency and focused on their mission are announced and companies apply through a rigorous process. A Phase I award comes first with amounts around $150,000. If that project is deemed successful, the company may apply for a Phase II for up to $1,000,000. Many companies in technical fields use SBIR funds to fund their early R&D activities. This is an excellent way to cover early proof of concept and development costs. Many venture firms see SBIR awards as proof of technical expertise because the awards are based on technical merit and are peer reviewed. SBIRs and STTRs are grants and do not dilute equity in a company.

Ten SBIR/STTR grants were awarded to the companies in the seCTer region in 2015, totaling almost $8 million. The seCTer region. On an award per capita basis, seCTer exceeded all peer regions and Connecticut overall but more than double.

Table 36: Research and Development Awards (SBIR/STTR), Regional Comparison, 2015

Research and Development - SBIR/STTR, 2015			
Region	Number of Awards	Amount Awarded	Amount Awarded Per Capita
seCTer Region	10	$7,830,630	$27.55
Hartford, CT MSA	21	$8,915,343	$7.33
Springfield, MA MSA	12	$5,098,156	$8.08
Worcester, MA-CT MSA	23	$11,141,915	$11.92
Connecticut	72	$29,444,170	$8.16

Source: SBIR

Venture Capital

The following table summarizes venture capital trends from the PricewaterhouseCoopers' MoneyTree.com website for all four MSAs and the state of Connecticut. This is the most reliable source of venture investment data for long-term trends. Their data is all reported by the venture investors themselves, so often does not include angel and earlier deals. Venture capital investments in 2015 for the Norwich-New London MSA[2] are far lower than that of Hartford and Worcester, both overall and on a per capita basis.

Table 37: Venture Capital Investment, Regional Comparison, 2015

Venture Capital Investment 2015				
MSA	Number of Deals	Number of Companies	Amount Invested	Amount Invested Per Capita
Norwich-New London, CT	2	1	$4,284,000	$15.63
Hartford, CT	18	14	$80,266,100	$65.97
Springfield, MA	1	1	Insf. Data	Insf. Data
Worcester, MA-CT	2	2	$175,000,000	$187.30
Connecticut	58		$449,906,100	$124.72

Source: Pricew aterhouseCoopers/National Venture Capital Association MoneyTree™ Report, Data: Thomson Reuters

[2] Norwich-New London MSA is defined as New London County.

Fiscal Profile

Grand List Value

The following table shows the value of the grand list for each municipality within the seCTer region. Due to differences in the timing of when individual municipalities reassess property, current grand list values are not comparable across municipalities. To account for these differences, the State calculates an Equalized Net Grand List Value so that values can be compared. The overall equalized grand list value of the entire seCTer region was approximately $32.2 billion in 2014. The municipalities with the highest grand list are the Town of Groton and the Town of Waterford, both at over $3 billion, followed by East Lyme and Norwich, both over $2 billion. The municipalities with the lowest equalized assessed values are Sprague, Franklin, and Bozrah, all under $300 million.

Table 38: Grand List Value by Municipality, 2012

seCTer Region Grand List Value		
Geographies	Total Net Grand List Value	Equalized Net Grand List Value
Town of Groton*	$3,868,863,246	$5,435,454,547
Waterford	$3,173,071,768	$4,602,445,285
Stonington	$2,592,616,626	$3,653,849,292
East Lyme	$2,050,119,208	$2,948,988,218
Norwich	$2,423,927,020	$2,574,691,786
New London	$1,569,776,194	$1,826,592,880
Montville	$1,241,891,661	$1,824,269,016
Colchester	$1,191,172,264	$1,683,452,351
Ledyard	$1,108,546,974	$1,562,200,147
Windham	$962,400,175	$1,231,071,101
Griswold	$695,610,176	$972,447,211
Lebanon	$675,482,689	$844,437,123
North Stonington	$542,625,576	$752,502,500
Preston	$381,825,751	$550,138,881
Lisbon	$368,210,844	$510,510,496
Salem	$360,941,990	$506,358,607
Bozrah	$215,585,700	$287,469,867
Franklin	$215,307,865	$270,251,429
Sprague	$163,859,991	$232,205,842
seCTer Region	$23,801,835,718	$32,269,336,579

*Town of Groton **includes** data from City of Groton

Includes aggregate valuation of taxable property within given town

Most recent estimates available from 2012

Source: State of Connecticut Office of Policy and Management

Mill Rate

Mill rates are developed based on the amount funding needed to balance a municipality's budget and assessed property values. Some municipalities may have artificially high mill rates if it has been a long time since the last property reassessment. The State provides an equalized mill rate for each municipality that allows for fair comparison. The municipalities with the highest equalized mill rates are Windham (28.07) and New London (23.58). Stonington (13.89) and Lisbon (12.66) have the lowest. The average mill rate across the region is 19.04.

Table 39: Mill Rate by Municipality, 2016

seCTer Region Mill Rates		
Municipality	2016 Mill Rate	Equalized Mill Rate
Windham	34.35	28.07
New London	39.49	23.58
Norwich	40.90	22.45
Salem	31.70	22.22
Colchester	30.76	21.10
Sprague	31.00	21.09
Ledyard	30.40	20.90
Montville	30.09	20.37
Lebanon	28.70	19.25
Griswold	26.57	19.00
Bozrah	27.00	18.39
North Stonington	26.10	17.55
Waterford	25.83	16.80
Preston	23.00	16.75
Franklin	24.72	16.61
East Lyme	24.71	16.27
Town of Groton	20.95	14.72
Stonington	21.32	13.89
Lisbon	19.50	12.66
City of Groton	5.868	-
Average	27.15	19.04

Note: 2016 Mill Rates reflect: "2014 Grand List Year 2016 Fiscal Year"
Equalized mill rate not available for City of Groton
Source: State of Connecticut Office of Policy and Management

Municipal Bond Ratings

Most municipalities in the seCTer region have high or upper medium ratings, meaning that the respective governments tend to manage their obligations properly and have appropriate money and resource management. The following bond ratings show the municipalities are solid and stable communities.

Table 40: Municipal Bond Ratings by Municipality, 2015

seCTer Region Bond Ratings, 2015			
Geographies	Moody's	Standard and Poor's	Fitch
Colchester	Aa3		
East Lyme	Aa2		
Griswold		AA	AA-
Town of Groton*	Aa2	AA+	AA
City of Groton	Aa3	AA-	
Ledyard	Aa2		
Lisbon	Aa3		
Montville	Aa3		
New London		A+	A+
Norwich	Aa2	AA	AA
Preston		AA+	
Salem	A1		
Sprague	A2		
Stonington	Aa1		
Waterford	Aa2	AA	
Windham	Aa3	AA	

*Town of Groton does not include data from City of Groton
Note: Bond ratings not availble for: Bozrah, Franklin, Lebanon, North Stonington

Source: State of Connectitcut Office of Policy and Management

Table 41: Municipal Bond Ratings Key

Investment Grade Rating Grades Key				
	Best	High	Upper Medium	Medium
Moody's	Aaa	Aa1 Aa2 Aa3	A1 A2 A3	Baa1 Baa2 Baa3
S & P's	AAA	AA+ AA AA-	A A A-	BBB+ BBB BBB-
Fitch	AAA	AA+ AA AA-	A A A-	BBB+ BBB BBB-

Source: State of Connectitcut Office of Policy and Management

Note: Municipalities are required to pay for ratings from each rating entity (Moody's, Standard and Poor's, and Fitch) therefore they may differ in the number of ratings they have.

Economic Profile

The regional economic profile presented in this section examines employment, establishments, earnings and output according to the standard industry classifications and groupings known as NAICS, the North American Industrial Classification System. Later in this report and following this section we analyze data on employment according to customized industry groupings for an examination of regional targeted opportunities.

Key Findings

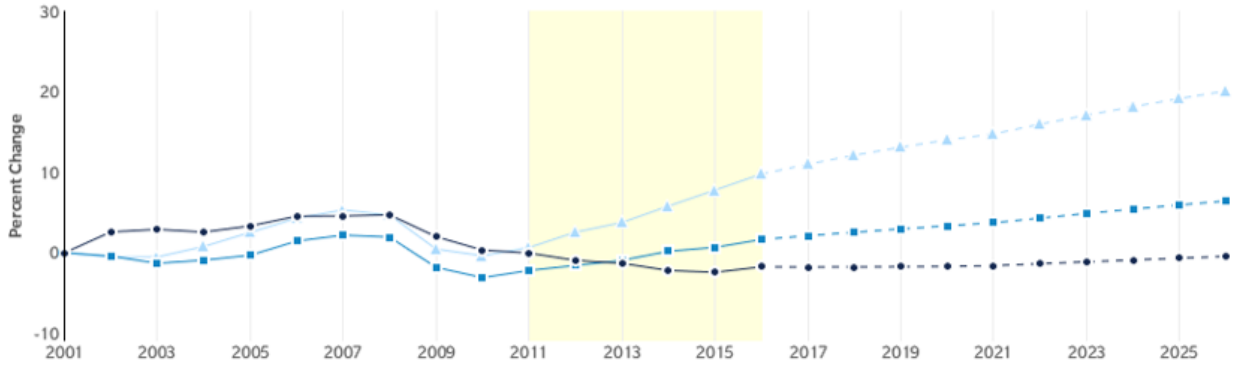
- Over the past 5 years, the seCTer region has lost close to 2,600 jobs, a decline of nearly 2%. This compares to job growth of nearly 4% in Connecticut overall and over 9% nationally.
- The region's overall job decline was driven by the Government sector, which shed over 5,700 jobs. Of those jobs, over 4,500 fall under Local Government, Excluding Education and Hospitals, a category that includes employment related to the region's casinos.[3]
- Of the 21 major industry sectors (2-digit NAICS) economy-wide, 14 showed growth. In terms of number of jobs, the Manufacturing and Accommodation/Food Services sectors showed the highest growth, adding about 1,700 and 1,100 jobs, respectively since 2011.
- Projections by EMSI for the region indicate that the number of jobs will remain almost flat, with an increase of about 200 jobs (a 0.0% increase). This compares to projected increases of 2% in Connecticut and 5% in the US. However, these projections do not include expected major increases at Electric Boat due to recent and projected future military contracts. So, employment projections based on econometric models must be viewed as representing a "worst-case" scenario.
- Currently, the largest 2-digit NAICS industries within the seCTer region are Government (including casinos and military) with close to 39,000 jobs, followed by Health Care and Social Assistance with nearly 21,000. Government jobs are projected to continue its decline in the next 5 years albeit at a slower rate (again, based on the EMSI model and excluding projected increases at Electric Boat), while Health Care and Social Assistance is projected to increase by 7% (over 1,500 jobs). Retail Trade and Manufacturing are the two next largest industries, both with over 16,000 jobs in 2016. Retail Trade is projected to grow by 1% in the next 5-year period and Manufacturing is projected to decrease by 2%.
- Total Gross Regional Product (GRP) for the region is $14.5 billion. The Government sector (including casinos and military) contributes the largest amount to GRP at $3.2 billion, followed by Manufacturing contributing $2.6 billion. Health Care and Social Assistance is the next largest contributor at $1.2 billion.
- The seCTer region has a national location quotient above 1.20 for the Utilities sector (2.26), Government (including casinos and military) (1.73), and Health Care and Social Assistance (1.13).
- Major industry sectors with the highest average earnings per worker include Utilities (average earnings of $180,000[4]), Manufacturing ($114,000) and Professional, Scientific, and Technical Services ($95,000). Lowest earnings sectors include Accommodation and Food Services ($23,000) Other Services ($26,000), and Arts, Entertainment, and Recreation ($30,000). Sectors with the highest dollar wage gains between 2005 and 2015 were Utilities and Wholesale Trade.
- Self-employed jobs in the seCTer region account for 5% of all jobs, compared to 6% nationally. Construction and Professional, Scientific, and Technical Services account for the most self-employed jobs of any sector.
- The shift share analysis of the seCTer region shows that region has a competitive advantage in Crop and Animal Production, Construction, Manufacturing, Wholesale Trade, and Management of Companies and

[3] Casinos in the region are owned and operated by Indian Nations and are therefore classified as local government.
[4] All earnings figures include benefits.

Enterprises. Among these, within the region Manufacturing has the most competitive advantage based on the shift share analysis.

- The industry with the most establishments in New London County[5] in 2015 was Retail Trade with 1,034 and an estimated 15 employees per each establishment
- The highest number of establishments in New London County are related to Retail Trade, at 1,034 total establishments, which is 14% of all establishments in the county. This is closely followed by 909 establishments for Other Services (except Public Administration).

Regional Economy by Industry Sector



Region	2011 Jobs	2016 Jobs	Change	% Change
Region	148,747	146,184	-2,563	-1.7%
Connecticut	1,797,758	1,868,407	70,649	3.9%
United States	145,672,482	158,866,954	13,194,472	9.1%

Figure 5: Percent Change in Jobs, seCTer Region, 2001-2026

[5] Establishment data for the seCTer region is unavailable.

Table 42: Jobs by 2-digit NAICS, seCTer Region, 2011, 2016, 2021

All Industries - seCTer Region								
NAICS (2-digit)	Description	2011 Jobs	2016 Jobs	2021 Jobs	2011 - 2016 Change	2011 - 2016 % Change	2016 - 2021 Change	2016 - 2021 % Change
11	Crop and Animal Production	1,607	1,639	1,692	31	2%	53	3%
21	Mining, Quarrying, and Oil and Gas Extraction	60	80	84	20	34%	3	4%
22	Utilities	1,479	1,183	713	(296)	(20%)	(470)	(40%)
23	Construction	5,516	5,551	5,673	34	1%	122	2%
31	Manufacturing	15,168	16,870	16,468	1,703	11%	(403)	(2%)
42	Wholesale Trade	2,609	2,783	3,143	174	7%	360	13%
44	Retail Trade	15,736	16,380	16,619	644	4%	239	1%
48	Transportation and Warehousing	3,633	3,413	3,335	(220)	(6%)	(78)	(2%)
51	Information	1,565	1,389	1,138	(176)	(11%)	(251)	(18%)
52	Finance and Insurance	2,197	2,114	1,981	(82)	(4%)	(133)	(6%)
53	Real Estate and Rental and Leasing	1,236	1,314	1,287	78	6%	(27)	(2%)
54	Professional, Scientific, and Technical Services	6,609	5,794	5,502	(815)	(12%)	(292)	(5%)
55	Management of Companies and Enterprises	665	872	971	208	31%	99	11%
56	Administrative and Support and Waste Management	3,460	3,464	3,251	4	0%	(213)	(6%)
61	Educational Services	3,277	2,806	2,881	(471)	(14%)	75	3%
62	Health Care and Social Assistance	20,256	20,846	22,397	590	3%	1,551	7%
71	Arts, Entertainment, and Recreation	2,035	2,254	2,168	220	11%	(86)	(4%)
72	Accommodation and Food Services	11,860	12,924	13,374	1,065	9%	450	3%
81	Other Services (except Public Administration)	5,555	5,815	6,015	260	5%	200	3%
90	Government	44,210	38,666	37,691	(5,543)	(13%)	(975)	(3%)
99	Unclassified Industry	15	25	34	10	70%	9	38%
	Total	148,747	146,184	146,417	(2,563)	(2%)	233	0%

Source: EMSI

Gross Regional Product

Table 43: Gross Regional Product by 2-digit NAICS, seCTer Region, 2015

seCTer Gross Regional Product			
NAICS (2-digit)	Description	GRP	% of Total GRP
11	Crop and Animal Production	$141,747,627	1%
21	Mining, Quarrying, and Oil and Gas Extraction	$92,768,250	1%
22	Utilities	$827,563,280	6%
23	Construction	$437,055,185	3%
31	Manufacturing	$2,670,917,184	18%
42	Wholesale Trade	$609,261,172	4%
44	Retail Trade	$850,666,139	6%
48	Transportation and Warehousing	$262,041,401	2%
51	Information	$235,719,947	2%
52	Finance and Insurance	$357,374,593	2%
53	Real Estate and Rental and Leasing	$340,895,132	2%
54	Professional, Scientific, and Technical Services	$695,234,761	5%
55	Management of Companies and Enterprises	$52,210,103	0%
56	Administrative and Support and Waste Management	$192,657,766	1%
61	Educational Services	$150,169,659	1%
62	Health Care and Social Assistance	$1,217,598,627	8%
71	Arts, Entertainment, and Recreation	$92,292,694	1%
72	Accommodation and Food Services	$405,194,990	3%
81	Other Services (except Public Administration)	$188,358,261	1%
90	Government	$3,258,066,426	22%
	Other Sectors	$1,426,805,694	10%
	Total	$14,504,598,891	100%

Source: EMSI

Location Quotient

Table 44: National Location Quotient by 2-digit NAICS, seCTer Region, 2016

2016 National Location Quotient			
NAICS (2-digit)	Description	seCTer Region	Connecticut
22	Utilities	2.26	0.82
90	Government	1.73	0.88
31	Manufacturing	1.47	1.10
62	Health Care and Social Assistance	1.13	1.20
44	Retail Trade	1.07	0.97
72	Accommodation and Food Services	1.04	0.81
11	Crop and Animal Production	0.92	0.30
71	Arts, Entertainment, and Recreation	0.91	1.06
81	Other Services (except Public Administration)	0.84	1.04
61	Educational Services	0.76	1.71
23	Construction	0.70	0.86
48	Transportation and Warehousing	0.70	0.81
54	Professional, Scientific, and Technical Services	0.62	0.98
53	Real Estate and Rental and Leasing	0.55	0.89
51	Information	0.51	1.04
42	Wholesale Trade	0.50	0.91
55	Management of Companies and Enterprises	0.42	1.26
56	Administrative and Support and Waste Management	0.38	0.85
52	Finance and Insurance	0.37	1.58
21	Mining, Quarrying, and Oil and Gas Extraction	0.14	0.09
99	Unclassified Industry	0.10	0.21

Source: EMSI

Earnings by Industry

Table 45: Average Earnings by 2-digit NAICS, seCTer Region, 2005-2015

seCTer Region Earnings by Industry					
NAICS Code (2-digit)	Description	2005 Average Earnings per Job	2015 Average Earnings per Job	2005 - 2015 Change	2005 - 2015 % Change
11	Crop and Animal Production	$28,422	$41,023	$12,601	44%
21	Mining, Quarrying, and Oil and Gas Extraction	$57,504	$62,812	$5,308	9%
22	Utilities	$120,872	$179,570	$58,698	49%
23	Construction	$46,788	$54,926	$8,138	17%
31	Manufacturing	$89,640	$113,888	$24,248	27%
42	Wholesale Trade	$55,428	$89,860	$34,432	62%
44	Retail Trade	$29,735	$33,219	$3,484	12%
48	Transportation and Warehousing	$41,312	$56,751	$15,440	37%
51	Information	$53,566	$60,407	$6,841	13%
52	Finance and Insurance	$54,523	$71,089	$16,567	30%
53	Real Estate and Rental and Leasing	$32,686	$43,431	$10,745	33%
54	Professional, Scientific, and Technical Services	$77,699	$94,993	$17,294	22%
55	Management of Companies and Enterprises	$42,393	$62,193	$19,800	47%
56	Administrative and Support and Waste Management	$29,722	$38,777	$9,055	30%
61	Educational Services	$34,906	$49,639	$14,733	42%
62	Health Care and Social Assistance	$46,904	$55,690	$8,785	19%
71	Arts, Entertainment, and Recreation	$25,464	$29,587	$4,123	16%
72	Accommodation and Food Services	$19,043	$22,520	$3,477	18%
81	Other Services (except Public Administration)	$22,113	$26,165	$4,052	18%
90	Government	$55,708	$66,653	$10,945	20%
99	Unclassified Industry	$33,667	$81,870	$48,203	143%
	Average	$51,060	$60,947	$16,046	34%

Note: Total Earnings includes: w ages, salaries, benefits

Source: EMSI

Self-Employment

Table 46: Self-Employed Jobs and Earnings by 2-digit NAICS, seCTer Region, 2015

seCTer Region Self-Employed by Industry, 2015						
NAICS Code (2-digit)	Description	Self-Employed in seCTer Region	% of All Jobs in seCTer Region	% Self-Employed in US	Average Earnings, Self-Employed in seCTer Region	Average Earnings, All Jobs in seCTer Region
11	Crop and Animal Production	498	30%	28%	$36,054	$41,023
21	Mining, Quarrying, and Oil and Gas Extraction	<10	<0%	2%	$19,160	$62,812
22	Utilities	0	0%	1%	$0	$179,570
23	Construction	1,762	32%	20%	$24,588	$54,926
31	Manufacturing	244	2%	2%	$51,440	$113,888
42	Wholesale Trade	97	4%	2%	$35,155	$89,860
44	Retail Trade	435	3%	4%	$26,279	$33,219
48	Transportation and Warehousing	90	3%	7%	$30,602	$56,751
51	Information	93	7%	5%	$22,544	$60,407
52	Finance and Insurance	149	7%	4%	$34,880	$71,089
53	Real Estate and Rental and Leasing	376	29%	17%	$28,155	$43,431
54	Professional, Scientific, and Technical Services	1,055	18%	12%	$41,817	$94,993
55	Management of Companies and Enterprises	0	0%	0%	$0	$62,193
56	Administrative and Support and Waste Management	573	16%	10%	$38,367	$38,777
61	Educational Services	244	8%	7%	$14,917	$49,639
62	Health Care and Social Assistance	723	4%	5%	$43,722	$55,690
71	Arts, Entertainment, and Recreation	259	12%	17%	$16,025	$29,587
72	Accommodation and Food Services	130	1%	2%	$31,080	$22,520
81	Other Services (except Public Administration)	1,103	19%	23%	$14,659	$26,165
90	Government	0	0%	0%	$0	$66,653
99	Unclassified Industry	0	0%	0%	$0	$81,870
	Total Self-Employed and Average Earnings	7,842	5%	6%	$29,993	$60,947

Source: EMSI

Establishments

Table 47: Number of Establishments by 2-digit NAICS, New London County, 2015

Establishments - New London County				
NAICS (2-digit)	Description	2015 Establishments	2015 Jobs	Average Employees per Establishment
11	Crop and Animal Production	61	1,650	27
21	Mining, Quarrying, and Oil and Gas Extraction	8	72	9
22	Utilities	14	1,289	92
23	Construction	602	5,590	9
31	Manufacturing	182	15,180	83
42	Wholesale Trade	388	2,883	7
44	Retail Trade	1,034	15,021	15
48	Transportation and Warehousing	109	3,238	30
51	Information	89	1,107	12
52	Finance and Insurance	290	1,995	7
53	Real Estate and Rental and Leasing	218	1,317	6
54	Professional, Scientific, and Technical Services	740	5,943	8
55	Management of Companies and Enterprises	41	833	20
56	Administrative and Support and Waste Management	408	3,139	8
61	Educational Services	92	2,849	31
62	Health Care and Social Assistance	750	17,763	24
71	Arts, Entertainment, and Recreation	138	2,292	17
72	Accommodation and Food Services	714	12,585	18
81	Other Services (except Public Administration)	909	5,522	6
90	Government	434	37,820	87
99	Unclassified Industry	20	23	1
	Total	7,241	138,112	25

Source: EMSI

Table 48: Businesses by Business Size, New London and Windham counties, 2015

Percent of Businesses by Business Size, 2015				
Percent of Businesses	New London County	Windham County	Connecticut	United States
Self Employed	14.0%	15.8%	12.5%	12.2%
2-9 Employees	69.0%	66.9%	71.4%	70.8%
10-99 Employees	15.6%	15.6%	14.8%	15.7%
100-499 Employees	1.3%	1.5%	1.3%	1.2%
500+ Employees	0.1%	0.2%	0.1%	0.1%

Source: YourEconomy

Shift Share Analysis

Shift Share Analysis distinguishes an industry's employment growth in a specific area that is attributable to local competitive advantages or disadvantages from growth which is attributable to overall national employment trends or national employment trends in that industry.

The shift share analysis helps to answer the question of "*Why is employment growing or declining in this local industry*?" To do this, shift share analysis splits regional job growth into three components: national change effect, industrial mix effect, and regional competitiveness effect. The following tables shows whether the seCTer region and the state of Connecticut have a particular competitive advantage compared to the other geographies (past and projected). A shift share analysis is based on four factors:

- **Industrial Mix Effect** – The industrial mix effect represents the share of regional industry growth explained by the growth of the specific industry at the national level. To arrive at this number, the national growth rate of the total economy is subtracted from the national growth rate of the specific industry, and this growth percentage is applied to the regional jobs in that industry.
- **National Growth Effect** – The national growth effect explains how much of the regional industry's growth is explained by the overall growth of the national economy: if the nation's whole economy is growing, you would generally expect to see some positive change in each industry in your local region (the proverbial "rising tide that lifts all boats" analogy).
- **Expected Change** – This is simply the rate of growth of the particular industry at the national level. Algebraically, the expected change is the sum of the industrial mix and the national growth.
- **Regional Competitive Effect** – The regional competitive effect is the most interesting of the three indicators. It explains how much of the change in a given industry is due to some unique competitive advantage that the region possesses, because the growth cannot be explained by national trends in that industry or the economy as whole. This effect is calculated by taking the total regional growth of the given industry and subtracting the national growth for that same industry. Note that this effect can be positive even as regional employment in the industry declines. This would indicate that regional decline is less than the national decline.

The shift share analysis shows that the seCTer region does not have a competitive advantage relative to other parts of the nation in most industry sectors. If the region's economy had mirrored national industry trends and overall national job growth, seCTer would have added over 11,000 jobs between 2011 and 2016. Instead, it lost about 2,500 jobs. This difference, known as the Competitive Effect, is a result of the unique characteristics of the region.

Manufacturing was the only sector in which the region showed a significant positive Competitive Effect, indicating that seCTer has a unique competitive advantage in this industry. While manufacturing employment has declined nationally, it has increased within the region.

Industry sectors with the largest negative Competitive Effect include Government (which includes military and casinos), Health Care and Social Assistance, and Professional, Scientific, and Technical Services. Like the seCTer region, Connecticut as a whole is at a competitive disadvantage relative to the nation in the majority of industry sectors.

Table 49: Shift Share Analysis, seCTer Region, 2011-2016 (Historic)

Shift Share - seCTer Region, 2011 - 2016					
NAICS (2-digit)	Description	Ind. Mix Effect	Nat'l Growth Effect	Expected Change	Competitive Effect
11	Crop and Animal Production	(71)	146	75	(43)
21	Mining, Quarrying, and Oil and Gas Extraction	(14)	5	(9)	29
22	Utilities	(87)	134	47	(343)
23	Construction	362	500	862	(827)
31	Manufacturing	(615)	1,374	759	944
42	Wholesale Trade	(65)	236	171	3
44	Retail Trade	(78)	1,425	1,347	(704)
48	Transportation and Warehousing	175	329	504	(724)
51	Information	(68)	142	74	(250)
52	Finance and Insurance	(83)	199	116	(199)
53	Real Estate and Rental and Leasing	(4)	112	108	(29)
54	Professional, Scientific, and Technical Services	388	599	987	(1,802)
55	Management of Companies and Enterprises	60	60	120	87
56	Administrative and Support and Waste Management	227	313	540	(536)
61	Educational Services	15	297	312	(783)
62	Health Care and Social Assistance	1,175	1,835	3,010	(2,419)
71	Arts, Entertainment, and Recreation	123	184	307	(88)
72	Accommodation and Food Services	899	1,074	1,973	(909)
81	Other Services (except Public Administration)	(442)	503	61	199
90	Government	(3,955)	4,004	49	(5,593)
99	Unclassified Industry	7	1	8	2
		(2,050)	13,473	11,423	(13,986)

Source: EMSI

**Note that Competitive Effect can be positive even as regional employment in the industry declines. This would indicate that regional decline is less than the national decline.*

Table 50: Shift Share Analysis, Connecticut, 2011-2016 (Historic)

Shift Share - Connecticut, 2011 - 2016					
NAICS (2-digit)	Description	Ind. Mix Effect	Nat'l Growth Effect	Expected Change	Competitive Effect
11	Crop and Animal Production	(296)	605	309	(49)
21	Mining, Quarrying, and Oil and Gas Extraction	(138)	53	(85)	140
22	Utilities	(361)	559	198	(914)
23	Construction	5,331	7,364	12,695	(6,435)
31	Manufacturing	(6,845)	15,286	8,441	(14,778)
42	Wholesale Trade	(1,624)	5,898	4,274	(4,472)
44	Retail Trade	(923)	16,925	16,002	(12,747)
48	Transportation and Warehousing	2,134	4,017	6,151	199
51	Information	(1,445)	3,016	1,571	1,210
52	Finance and Insurance	(4,516)	10,841	6,325	(11,519)
53	Real Estate and Rental and Leasing	(85)	2,301	2,216	(378)
54	Professional, Scientific, and Technical Services	6,347	9,791	16,138	(7,411)
55	Management of Companies and Enterprises	2,595	2,592	5,187	(416)
56	Administrative and Support and Waste Management	6,069	8,378	14,447	(7,360)
61	Educational Services	328	6,447	6,775	3,206
62	Health Care and Social Assistance	15,379	24,017	39,396	(21,934)
71	Arts, Entertainment, and Recreation	1,845	2,761	4,606	(1,527)
72	Accommodation and Food Services	8,837	10,554	19,391	(6,944)
81	Other Services (except Public Administration)	(7,039)	8,016	977	2,972
90	Government	(23,096)	23,386	290	(5,865)
99	Unclassified Industry	140	28	168	195
		2,640	162,834	165,474	(94,825)

Source: EMSI

Table 51: Shift Share Analysis, seCTer Region, 2016-2021 (Projected)

Shift Share - seCTer Region, 2016 - 2021					
NAICS (2-digit)	Description	Ind. Mix Effect	Nat'l Growth Effect	Expected Change	Competitive Effect
11	Crop and Animal Production	(85)	75	(10)	64
21	Mining, Quarrying, and Oil and Gas Extraction	11	4	15	(12)
22	Utilities	(56)	54	(2)	(468)
23	Construction	(150)	253	103	19
31	Manufacturing	(1,238)	768	(470)	68
42	Wholesale Trade	(18)	127	109	252
44	Retail Trade	(275)	746	471	(231)
48	Transportation and Warehousing	(4)	155	151	(229)
51	Information	(71)	63	(8)	(244)
52	Finance and Insurance	(33)	96	63	(196)
53	Real Estate and Rental and Leasing	(35)	60	25	(52)
54	Professional, Scientific, and Technical Services	256	264	520	(812)
55	Management of Companies and Enterprises	10	40	50	49
56	Administrative and Support and Waste Management	92	158	250	(463)
61	Educational Services	125	128	253	(177)
62	Health Care and Social Assistance	1,330	949	2,279	(728)
71	Arts, Entertainment, and Recreation	27	103	130	(216)
72	Accommodation and Food Services	164	588	752	(303)
81	Other Services (except Public Administration)	(28)	265	237	(37)
90	Government	(878)	1,760	882	(1,858)
99	Unclassified Industry	1	1	2	7
		(855)	6,655	5,800	(5,567)

Source: EMSI

Table 52: Shift Share Analysis, Connecticut, 2016-2021 (Projected)

Shift Share - Connecticut, 2016 - 2021					
NAICS (2-digit)	Description	Ind. Mix Effect	Nat'l Growth Effect	Expected Change	Competitive Effect
11	Crop and Animal Production	(362)	316	(46)	363
21	Mining, Quarrying, and Oil and Gas Extraction	92	29	121	(145)
22	Utilities	(258)	248	(10)	(808)
23	Construction	(2,361)	3,986	1,625	(958)
31	Manufacturing	(11,922)	7,394	(4,528)	(6,938)
42	Wholesale Trade	(423)	2,955	2,532	(2,654)
44	Retail Trade	(3,194)	8,655	5,461	(6,303)
48	Transportation and Warehousing	(57)	2,308	2,251	(1,075)
51	Information	(1,833)	1,642	(191)	(1,657)
52	Finance and Insurance	(1,793)	5,212	3,419	(4,088)
53	Real Estate and Rental and Leasing	(724)	1,240	516	(593)
54	Professional, Scientific, and Technical Services	5,152	5,318	10,470	(4,851)
55	Management of Companies and Enterprises	392	1,520	1,912	(774)
56	Administrative and Support and Waste Management	2,640	4,533	7,173	(5,843)
61	Educational Services	3,601	3,695	7,296	2,846
62	Health Care and Social Assistance	18,036	12,866	30,902	(4,807)
71	Arts, Entertainment, and Recreation	395	1,528	1,923	(1,758)
72	Accommodation and Food Services	1,641	5,871	7,512	(2,486)
81	Other Services (except Public Administration)	(441)	4,209	3,768	(1,215)
90	Government	(5,733)	11,500	5,767	(5,858)
99	Unclassified Industry	23	31	54	122
		2,871	85,053	87,924	(49,480)

Source: EMSI

Retail Gap Analysis

In a retail gap analysis, the existing retail sales ("supply") of trade area businesses are compared to the estimated retail spending of trade area residents ("demand"). The difference between demand and supply is referred to as the "retail gap."[6]

When the demand (spending by trade area residents) for goods and services is greater than sales at trade area businesses, sales are said to "leak out" of the trade area, creating a positive retail gap (i.e. sales leakage). Conversely, if the supply of goods sold (local trade area sales) exceeds trade area demand (spending by trade area residents), it is assumed that non-residents are coming into the trade area and spending money, creating a negative retail gap (i.e. sales surplus).

Sales leakage and sales surplus carry different implications. In many cases, sales leakage presents an opportunity to capture unmet demand in a trade area since a percentage of residential spending occurs outside the trade area. This demand can be met within the trade area by opening new businesses or expanding existing businesses within retail sectors that show sales leakage. However, not all retail categories that exhibit sales leakage within a particular trade area are a good fit for the region.

A sales surplus might exist for several reasons. For example, the region might be a popular shopping destination for tourists and other out-of-towners, or a cluster of competing businesses offering a similar product or service may be located within the trade area, creating a specialty cluster that draws in spending by households from outside the trade area. Alternatively, a sales surplus could be an indicator of market saturation.

The following Retail Gap Analysis table contains a list of industry groups sorted by 3- and 4-digit NAICS codes and includes figures for sales demand (estimated spending by local trade area residents), sales supply (existing retail sales within the trade area), and retail gap (demand minus supply). Retail categories with sales leakage are in green, and those with sales surplus are in red.

Industries experiencing the greatest sales leakage include:

- Electronics and Appliance Stores
- Health and Personal Care Stores
- Clothing and Clothing Accessories Stores

The overall level of retail leakage indicates that residents leave the trade area for many types of purchases. This indicates that there may be opportunities for the industries with leakage to recapture some consumer demand. However, this does not necessarily indicate that new businesses would succeed in the seCTer Region. The Business Potential analysis following the Retail Gap analysis provides further insight into opportunities for and feasibility of investments in different retail sectors.

[6] Note that existing retail sales are specific to the defined trade area whereas retail spending is an estimate of gross spending by residents living in the trade area regardless of where the retail spending occurs and could include internet sales.

Table 53: Retail Gap, seCTer Region, 2016

Retail Gap, seCTer Region Trade Area						
NAICS	Industry Group	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap	Leakage/ Surplus Factor	Number of Businesses
441	Motor Vehicle & Parts Dealers	$ 957,653,526	$ 931,309,454	$ 26,344,072	1.4	173
4411	Automobile Dealers	$ 806,227,358	$ 789,236,538	$ 16,990,820	1.1	71
4412	Other Motor Vehicle Dealers	$ 100,118,732	$ 108,048,456	$ (7,929,724)	(3.8)	58
4413	Auto Parts, Accessories & Tire Stores	$ 51,307,436	$ 34,024,460	$ 17,282,976	20.3	44
442	Furniture & Home Furnishings Stores	$ 142,168,581	$ 93,506,833	$ 48,661,748	20.6	88
4421	Furniture Stores	$ 79,589,491	$ 64,339,674	$ 15,249,817	10.6	34
4422	Home Furnishings Stores	$ 62,579,090	$ 29,167,159	$ 33,411,931	36.4	54
443	Electronics & Appliance Stores	$ 260,137,967	$ 94,989,888	$ 165,148,079	46.5	78
444	Bldg Materials, Garden Equip. & Supply Stores	$ 191,730,143	$ 228,461,356	$ (36,731,213)	(8.7)	145
4441	Bldg Material & Supplies Dealers	$ 162,531,305	$ 201,541,818	$ (39,010,513)	(10.7)	112
4442	Lawn & Garden Equip & Supply Stores	$ 29,198,838	$ 26,919,538	$ 2,279,300	4.1	33
445	Food & Beverage Stores	$ 869,063,137	$ 822,554,694	$ 46,508,443	2.7	270
4451	Grocery Stores	$ 734,040,658	$ 712,579,573	$ 21,461,085	1.5	130
4452	Specialty Food Stores	$ 58,258,750	$ 21,340,524	$ 36,918,226	46.4	39
4453	Beer, Wine & Liquor Stores	$ 76,763,729	$ 88,634,597	$ (11,870,868)	(7.2)	101
446,4461	Health & Personal Care Stores	$ 316,207,214	$ 230,426,985	$ 85,780,229	15.7	126
447,4471	Gasoline Stations	$ 251,494,545	$ 278,409,227	$ (26,914,682)	(5.1)	113
448	Clothing & Clothing Accessories Stores	$ 279,609,192	$ 205,293,490	$ 74,315,702	15.3	200
4481	Clothing Stores	$ 199,585,273	$ 142,367,023	$ 57,218,250	16.7	132
4482	Shoe Stores	$ 31,649,461	$ 17,583,534	$ 14,065,927	28.6	20
4483	Jewelry, Luggage & Leather Goods Stores	$ 48,374,458	$ 45,342,933	$ 3,031,525	3.2	48
451	Sporting Goods, Hobby, Book & Music Stores	$ 122,952,079	$ 101,743,596	$ 21,208,483	9.4	126
4511	Sporting Goods/Hobby/Musical Instr Stores	$ 106,907,097	$ 88,454,290	$ 18,452,807	9.4	101
4512	Book, Periodical & Music Stores	$ 16,044,982	$ 13,289,306	$ 2,755,676	9.4	25
452	General Merchandise Stores	$ 620,233,566	$ 820,328,341	$ (200,094,775)	(13.9)	62
4521	Department Stores Excluding Leased Depts.	$ 456,883,162	$ 664,839,886	$ (207,956,724)	(18.5)	30
4529	Other General Merchandise Stores	$ 163,350,404	$ 155,488,455	$ 7,861,949	2.5	32
453	Miscellaneous Store Retailers	$ 189,396,049	$ 165,800,185	$ 23,595,864	6.6	308
4531	Florists	$ 10,664,323	$ 18,792,898	$ (8,128,575)	(27.6)	42
4532	Office Supplies, Stationery & Gift Stores	$ 49,135,876	$ 33,449,933	$ 15,685,943	19.0	75
4533	Used Merchandise Stores	$ 10,424,003	$ 14,691,447	$ (4,267,444)	(17.0)	83
4539	Other Miscellaneous Store Retailers	$ 119,171,847	$ 98,865,907	$ 20,305,940	9.3	108
454	Nonstore Retailers	$ 94,178,050	$ 40,103,936	$ 54,074,114	40.3	23
4541	Electronic Shopping & Mail-Order Houses	$ 57,759,451	$ 17,772,583	$ 39,986,868	52.9	10
4542	Vending Machine Operators	$ 3,487,191	$ 871,961	$ 2,615,230	60.0	2
4543	Direct Selling Establishments	$ 32,931,408	$ 21,459,392	$ 11,472,016	21.1	11
722	Food Services & Drinking Places	$ 437,012,025	$ 557,559,070	$ (120,547,045)	(12.1)	786
7221	Full-Service Restaurants	$ 243,102,993	$ 298,898,195	$ (55,795,202)	(10.3)	473
7222	Limited-Service Eating Places	$ 170,385,311	$ 232,018,210	$ (61,632,899)	(15.3)	264
7223	Special Food Services	$ 18,016,766	$ 16,206,956	$ 1,809,810	5.3	22
7224	Drinking Places - Alcoholic Beverages	$ 5,506,955	$ 10,435,709	$ (4,928,754)	(30.9)	27
	Total Retail Trade and Food & Drink	$ 4,731,836,074	$ 4,570,487,055	$ 161,349,019	1.7	2,498

Data Note: Supply (retail sales) estimates sales to consumers by establishments. Sales to businesses are excluded. Demand (retail potential) estimates the expected amount spent by consumers at retail establishments. Supply and demand estimates are in current dollars. The Leakage/Surplus Factor presents a snapshot of retail opportunity. This is a measure of the relationship between supply and demand that ranges from +100 (total leakage) to -100 (total surplus). A positive value represents 'leakage' of retail opportunity outside the trade area. A negative value represents a surplus of retail sales, a market where customers are drawn in from outside the trade area. The Retail Gap represents the difference between Retail Potential and Retail Sales. Esri uses the North American Industry Classification System (NAICS) to classify businesses by their primary type of economic activity. Retail establishments are classified into 27 industry groups in the Retail Trade sector, as well as four industry groups within the Food Services & Drinking Establishments subsector

Source: Esri

Retail Potential Analysis

In the following table, we compare the retail spending gap in the seCTer region within the retail categories that have sales leakage to the average sales of similar businesses in Connecticut. This allows us to identify which of the industries with sales leakage may have enough unmet demand to warrant opening a new store or expanding existing stores.

The table below identifies the number of new businesses that, theoretically, could be supported in the trade area, assuming:

1. 25% of the sales leakage is recaptured (this is typical among various retail categories), and
2. New businesses have sales comparable to the average sales of all Connecticut businesses in the same retail category.

Table 54: New Retail Business Potential, seCTer Region, 2016

New Retail Business Potential					
A	B	C	D	E	F
NAICS	Industry Group	Retail Gap	25% Leakage Recapture (C × 25%)	Average Sales per Business (CT)	Potential New Businesses (D / E)
4481	Clothing Stores	$ 57,218,250	$ 14,304,563	$ 1,114,487	12.8
4461	Health & Personal Care Stores	$ 85,780,229	$ 21,445,057	$ 2,147,837	10.0
4422	Home Furnishings Stores	$ 33,411,931	$ 8,352,983	$ 1,036,568	8.1
4452	Specialty Food Stores	$ 36,918,226	$ 9,229,557	$ 1,246,832	7.4
4532	Office Supplies, Stationery & Gift Stores	$ 15,685,943	$ 3,921,486	$ 623,728	6.3
4539	Other Miscellaneous Store Retailers	$ 20,305,940	$ 5,076,485	$ 868,377	5.8
4413	Auto Parts, Accessories & Tire Stores	$ 17,282,976	$ 4,320,744	$ 859,251	5.0
4511	Sporting Goods/Hobby/Musical Instr Stores	$ 18,452,807	$ 4,613,202	$ 1,048,862	4.4
4482	Shoe Stores	$ 14,065,927	$ 3,516,482	$ 1,017,217	3.5
4541	Electronic Shopping & Mail-Order Houses	$ 39,986,868	$ 9,996,717	$ 2,893,450	3.5
4421	Furniture Stores	$ 15,249,817	$ 3,812,454	$ 1,821,536	2.1
7223	Special Food Services	$ 1,809,810	$ 452,453	$ 418,073	1.1

Note: Table includes retail categories in which at least one new business could be supported

Source: Esri, Camoin Associates

The retail categories with the greatest opportunity include:

- Clothing Stores
- Health & Personal Care Stores

Targeted Industry Profile

The preceding economic profile focused on standard groupings of industries according to major 2-digit NAICS sectors. To better understand industry niches and targeted opportunities in the region, we examined as part of the data analysis employment, occupations and earnings according to customized industry groupings or "clusters." This examination was based on a complete review of data down to the most detailed industry classification level (6-digit NAICS) to identify trends, strengths, and weakness. It was also based on our review of targeted Industries identified previously by seCTer, industry focus groups conducted for this analysis, and our experience with targeted industry trends throughout the US and Northeast. Based on this process we analyzed nine industry groupings to potentially target as clusters including:

- Tourism
- Healthcare Services
- Defense
- Energy and Environment
- Bioscience
- Agriculture, Fishing, and Food Production
- Creative
- Advanced Manufacturing
- Maritime

For each we examined data on employment, output as measured by contribution to gross regional product (GRP), and occupations. Based on the data we include key findings within each and what the findings mean in terms of their potential for regional economic growth strategies. In cases where focus groups were conducted, we also supplemented the data with findings from those sessions.

It should be noted that the clusters have been carefully defined to include only 6-digit NAICS codes of significance. Appendix C provides a complete list of all 6-digit NAICS codes for each cluster. For the following individual cluster analyses, the 6-digit NAICS codes showing fewer than 10 jobs have been omitted. The following cluster analyses also focus on the seCTer region specifically.

Table 55: Industry Cluster Employment Summary

Past, Present, and Projected Industry Jobs								
Cluster	2011 Jobs	2016 Jobs	2021 Jobs	2011 - 2016 Change	2011 - 2016 % Change	2016 - 2021 Change	2016 - 2021 % Change	GRP
Tourism	25,609	27,430	28,003	1,821	7%	573	2%	$1,032,095,450
Healthcare Services	20,256	20,846	22,397	590	3%	1,551	7%	$1,217,181,099
Defense	17,524	19,319	19,877	1,795	10%	558	3%	$2,232,344,853
Energy and Environment	6,059	5,513	5,090	(546)	(9%)	(423)	(8%)	$1,323,743,124
Bioscience	4,014	2,994	2,033	(1,020)	(25%)	(961)	(32%)	$1,244,529,655
Agriculture, Fishing, and Food Production	1,963	2,144	2,204	181	9%	60	3%	$174,925,626
Creative	2,103	1,928	1,727	(175)	(8%)	(201)	(10%)	$112,972,887
Advanced Manufacturing	2,052	1,917	1,883	(135)	(7%)	(34)	(2%)	$239,246,665
Maritime	371	422	366	51	14%	(56)	(13%)	$48,172,442
seCTer Region	148,747	146,184	146,417	(2,563)	(2%)	233	0%	$14,504,598,891
Connecticut	1,797,758	1,868,407	1,906,851	70,649	4%	38,444	2%	$243,910,568,213
U.S.	145,672,482	158,866,954	166,098,861	13,194,472	9%	7,231,907	5%	$16,751,927,728,210

Source: EMSI

Tourism Cluster

This cluster is defined broadly and includes all of arts, entertainment, and recreation; all of accommodation and food services; passenger related transportation; and all retail except retail that primarily serves the regional residential market, such as auto dealerships. For this cluster analysis, we have chosen to exclude the casino industry in the data tables but provide insights in the impact of the gaming industry in the narrative below. We have done this because in the seCTer region there are two large casinos operated by Indian Nations, and are thus classified under as employment within "Local Government, excluding Education and Hospitals." Using NAICS data, we are unable to "net-out" other local government employment such as municipal police, fire, public works and therefore if included the data would significantly overestimate the cluster. The resulting data tables below should be seen as providing an understanding of tourism in the region beyond the gaming industry. We understand that the gaming industry is important to the region, which is why we provided additional detail in the narrative below.

Key Findings

- The Tourism cluster currently makes up 19% of the seCTer region economy with 27,430 jobs in 2016. This cluster has the largest percentage of jobs in the seCTer region of the 9 clusters examined and accounts for 7% of the seCTer region GRP.
- The Tourism cluster has shown growth over the past 5 years adding 1,821 jobs, a 7% increase to the cluster, and is projected to continue growing in the upcoming 5-year period. Similarly, Tourism grew in Connecticut over the past 5 years by about 15,676 jobs, a 5% increase. This cluster also grew by 12% across the United States.
- The largest 6-digit NAICS industry within the cluster is Full-Service Restaurants, with over 6,000 jobs, or about 22% of jobs in 2016. This industry contributes $156,728,165 to seCTer GRP.
- Within this cluster, average earnings for 2016 in the seCTer Region being $26,337, are lower than that of Connecticut and the United States, being $29,283 and $27,543 respectively. Overall, average earnings in the cluster are lower than that for all industries combined.
- Forty-three percent (43%) of employees, or 11,760 people, within this cluster work as Retail Salespersons, Cashiers, Waiters and Waitresses, and Combined Food Preparation and Serving Workers (including Fast Food) with median hourly earnings of about $10.

The Gaming Industry and Tourism in the Region

The gaming industry is significant within the seCTer region. It experienced significant growth in the region in the decade before the past recession, but significant losses in its wake. According to the CT Department of Labor there were an estimated 13,232 jobs in the Amusement, Gambling, and Recreation industry in 2015 in New London County that were classified as "local government,"[7] the employment category in which casino jobs are listed.

The Eastern CT Workforce Investment Board (EWIB) as part of their Comprehensive Four-Year Plan: 2016-2020 also indicates the following:

- Connecticut employment reached a post-recession low in 2010 (less than two years after the recession), while Norwich-New London did not reach its low until 2015, after seven consecutive years of job losses. The gaming industry represented the major source of losses in the region due to the reduction of thousands of jobs resulting from difficult conditions in the regional economy coupled with competition in the gaming market. Other regional industry sectors followed the job loss and recovery trends more consistent with other regions across Connecticut and the U.S.

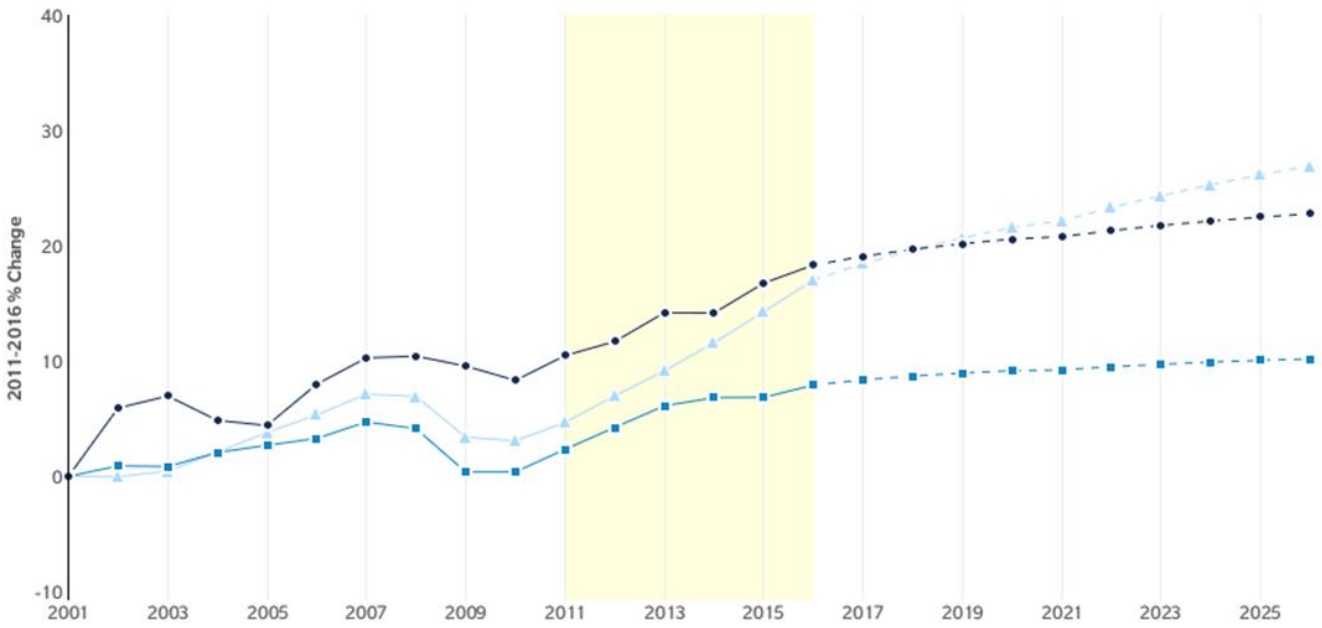
[7] CT DOL Quarterly Census of Employment and Wages (QCEW) Program - http://www1.ctdol.state.ct.us/lmi/datatools.asp

- The gaming industry is a major employer in Eastern Connecticut. In the 1990s, the two regional casinos drove the economic expansion, adding thousands of workers. In the past decade however, these casinos have been significantly impacted by the economic malaise as well as the proliferation of competition throughout New England and the Northeast. The result has been an estimated loss of 8,000 direct and 4,080 indirect jobs between 2008 and 2015, a significant impact to the region economy and job loss and recovery statistics.
- Regional gaming executives have expressed apprehension about even more potential job losses due to increased casino competition in neighboring states. Legislative proposals are being considered to address this issue, including permitting a new casino in another part of the state. EWIB will continue to monitor the competitive pressures on the gaming industry,

What This Means for Regional Economic Growth Strategies

With a significant share of regional jobs, this cluster is and will continue to be an important part of the regional economy and should be included as a primary cluster to target. The region has many assets to continue to build on including strategic coastal location, a known history and reputation for visitation, considerable recreation amenities including the Mystic Aquarium, Seaport, and Village, casinos, retail outlets, numerous accommodation and food service businesses, outdoor recreation and open space, and stakeholders to support and advocate for its growth, including Chambers of Commerce. Future success will require strategies to continue investment to maintain and expand assets and infrastructure; providing increased transportation and pedestrian options, increasing wages and overall quality of service while remaining competitive, and solidifying and coordinating existing messages into unifying themes to market the region as a whole. Coordination with agriculture and fishing industries offers opportunities for growth around local food initiatives. Rejuvenation of downtowns and village centers as quality, mixed-use places offer further opportunities, as does building on recent growth in marine related tourism (tours, ferries, etc.).

Tourism Employment



Region	2011 Jobs	2016 Jobs	Change	% Change	2016 Average Earnings
seCTer Region	25,609	27,430	1,821	7%	$26,337
Connecticut	287,656	303,332	15,676	5%	$29,283
United States	25,744,297	28,779,411	3,035,114	12%	$27,543

Figure 6: Tourism Cluster Employment Trends

Table 56: Tourism Cluster, Change in Employment, 2011, 2016, 2021

Past, Present, and Projected Industry Jobs							
Total	2011 Jobs	2016 Jobs	2021 Jobs	2011 - 2016 Change	2011 - 2016 % Change	2016 - 2021 Change	2016 - 2021 % Change
Tourism Cluster	25,609	27,430	28,003	1,821	7%	573	2%
seCTer Region	148,747	146,184	146,417	(2,563)	(2%)	233	0%
Tourism as Percent of seCTer Region	17%	19%	19%	-	-	-	-
Connecticut	1,797,758	1,868,407	1,906,851	70,649	4%	38,444	2%
U.S.	145,672,482	158,866,954	166,098,861	13,194,472	9%	7,231,907	5%

Source: EMSI

Table 57: Tourism Cluster by 6-digit NAICS Industry

Tourism Cluster Detail									
NAICS (6-digit)	Description	2011 Jobs	2016 Jobs	2011-2016 Change	2011-2016 % Change	2016 Location Quotient	Multiplier	Estimated Employees per Establishment*	GRP
722511	Full-Service Restaurants	5,183	6,040	857	17%	1.22	1.1091	21	$156,728,165
722513	Limited-Service Restaurants	2,604	2,704	100	4%	0.69	1.1178	14	$81,989,755
445110	Supermarkets and Other Grocery (except Convenience) Stores	2,761	2,695	(66)	(2%)	1.14	1.1404	73	$129,578,183
721110	Hotels (except Casino Hotels) and Motels	1,703	1,714	11	1%	1.19	1.1927	29	$97,573,135
452910	Warehouse Clubs and Supercenters	1,432	1,427	(5)	(0%)	1.03	1.1608	317	$74,146,010
722515	Snack and Nonalcoholic Beverage Bars	1,299	1,372	73	6%	2.35	1.0490	12	$26,173,084
452112	Discount Department Stores	1,085	1,052	(33)	(3%)	1.34	1.1228	109	$45,116,641
448140	Family Clothing Stores	390	755	365	94%	1.93	1.1153	25	$12,763,355
446110	Pharmacies and Drug Stores	608	625	17	3%	0.94	1.2623	12	$43,584,723
447110	Gasoline Stations with Convenience Stores	450	535	85	19%	0.70	1.1289	6	$17,603,826
452990	All Other General Merchandise Stores	264	506	242	92%	1.31	1.1070	13	$16,986,562
713940	Fitness and Recreational Sports Centers	335	458	123	37%	0.79	1.0723	12	$7,849,218
722310	Food Service Contractors	390	404	14	4%	0.82	1.1029	17	$19,385,555
712110	Museums	348	393	45	13%	4.62	1.2288	45	$14,739,157
453220	Gift, Novelty, and Souvenir Stores	392	377	(15)	(4%)	2.39	1.0945	10	$12,846,642
448120	Women's Clothing Stores	310	364	54	17%	1.31	1.0935	11	$8,015,496
443142	Electronics Stores	437	339	(98)	(22%)	0.75	1.2231	8	$20,341,149
445310	Beer, Wine, and Liquor Stores	314	325	11	4%	2.17	1.1065	5	$13,779,478
722320	Caterers	280	314	34	12%	1.63	1.0515	28	$7,077,242
713930	Marinas	259	279	20	8%	7.51	1.2312	9	$17,909,218
452111	Department Stores (except Discount Department Stores)	391	265	(126)	(32%)	0.60	1.1132	96	$12,067,600
448210	Shoe Stores	113	264	151	134%	1.30	1.1141	10	$4,621,872
712130	Zoos and Botanical Gardens	209	263	54	26%	7.29	1.2560	263	$10,223,848
722410	Drinking Places (Alcoholic Beverages)	208	234	26	13%	0.65	1.0574	8	$5,526,447
448310	Jewelry Stores	193	208	15	8%	1.54	1.1952	7	$9,773,107
713910	Golf Courses and Country Clubs	167	207	40	24%	0.59	1.1915	25	$9,937,740
451120	Hobby, Toy, and Game Stores	226	197	(29)	(13%)	1.22	1.0864	11	$5,108,449
446120	Cosmetics, Beauty Supplies, and Perfume Stores	104	164	60	58%	1.18	1.1385	12	$6,239,694
451110	Sporting Goods Stores	202	161	(41)	(20%)	0.53	1.1200	6	$6,331,689
453310	Used Merchandise Stores	171	143	(28)	(16%)	0.69	1.0821	6	$7,939,621
711510	Independent Artists, Writers, and Performers	150	138	(12)	(8%)	0.51	1.0473	19	$6,901,779
445120	Convenience Stores	184	137	(47)	(26%)	0.83	1.0928	3	$6,027,767
442110	Furniture Stores	134	135	1	1%	0.63	1.2513	6	$10,110,942
444130	Hardware Stores	159	133	(26)	(16%)	0.90	1.1729	7	$6,457,011
453998	All Other Miscellaneous Store Retailers (except Tobacco Stores)	165	129	(36)	(22%)	0.87	1.1235	11	$10,551,116
713990	All Other Amusement and Recreation Industries	163	105	(58)	(36%)	0.56	1.0593	8	$3,846,412
451211	Book Stores	96	98	2	2%	1.33	1.1061	9	$3,001,868
721211	RV (Recreational Vehicle) Parks and Campgrounds	120	94	(26)	(22%)	3.31	1.2044	6	$5,885,912
442299	All Other Home Furnishings Stores	97	93	(4)	(4%)	0.55	1.1094	10	$3,103,721
445299	All Other Specialty Food Stores	48	88	40	83%	1.10	1.0941	6	$3,164,686
453210	Office Supplies and Stationery Stores	81	87	6	7%	0.77	1.2112	18	$4,275,642
448190	Other Clothing Stores	88	85	(3)	(3%)	0.69	1.1335	7	$3,034,958

447190	Other Gasoline Stations	110	85	(25)	(23%)	0.84	1.2224	7	$6,136,758
441228	Motorcycle, ATV, and All Other Motor Vehicle Dealers	41	80	39	95%	1.05	1.2037	15	$5,058,853
453110	Florists	83	79	(4)	(5%)	1.12	1.0747	6	$1,977,075
711211	Sports Teams and Clubs	57	71	14	25%	0.79	1.0523	32	$977,368
445292	Confectionery and Nut Stores	43	65	22	51%	2.76	1.1135	10	$2,245,178
711130	Musical Groups and Artists	50	64	14	28%	1.39	1.4365	13	$3,652,302
448320	Luggage and Leather Goods Stores	27	64	37	137%	4.14	1.1588	21	$1,391,878
711212	Racetracks	72	61	(11)	(15%)	1.66	1.0230	61	$645,201
451130	Sewing, Needlework, and Piece Goods Stores	62	60	(2)	(3%)	1.28	1.0762	10	$2,001,229
446199	All Other Health and Personal Care Stores	40	58	18	45%	1.05	1.2716	5	$5,041,811
448150	Clothing Accessories Stores	49	55	6	12%	0.82	1.0987	4	$1,722,806
711110	Theater Companies and Dinner Theaters	43	51	8	19%	0.74	1.2332	8	$2,665,360
451140	Musical Instrument and Supplies Stores	52	49	(3)	(6%)	1.52	1.1584	8	$2,617,746
448130	Children's and Infants' Clothing Stores	50	49	(1)	(2%)	0.67	1.0869	6	$1,167,929
713950	Bowling Centers	71	46	(25)	(35%)	0.74	1.0920	15	$1,412,228
711190	Other Performing Arts Companies	38	37	(1)	(3%)	4.57	1.2031	37	$838,209
446191	Food (Health) Supplement Stores	38	36	(2)	(5%)	0.71	1.0974	5	$1,133,466
448110	Men's Clothing Stores	27	33	6	22%	0.68	1.1991	7	$1,203,982
443141	Household Appliance Stores	46	31	(15)	(33%)	0.55	1.2165	7	$2,106,636
712190	Nature Parks and Other Similar Institutions	19	28	9	47%	2.96	1.1231	28	$545,087
445210	Meat Markets	29	26	(3)	(10%)	0.53	1.1271	14	$954,847
445220	Fish and Seafood Markets	57	25	(32)	(56%)	1.69	1.1076	4	$1,700,330
721214	Recreational and Vacation Camps (except Campgrounds)	36	23	(13)	(36%)	0.70	1.1203	23	$1,424,037
453991	Tobacco Stores	14	21	7	50%	0.39	1.0681	5	$2,661,183
711410	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures	<10	16	Insf. Data	Insf. Data	0.50	1.2490	16	$1,340,676
453920	Art Dealers	18	16	(2)	(11%)	0.73	1.1228	4	$2,368,136
445230	Fruit and Vegetable Markets	18	14	(4)	(22%)	0.33	1.0516	4	$492,381
441210	Recreational Vehicle Dealers	11	14	3	27%	0.36	1.1096	14	$606,307
713290	Other Gambling Industries	16	13	(3)	(19%)	0.28	1.1425	13	$7,687,976
	Total	25,609	27,430	1,821	7%				$1,032,095,450

*Employees per establishment estimates reflect 2015 establishment data from New London County

Note: Any industry with less than 10 jobs in 2016 is not individually listed in this table, a full list of all industries included in the cluster can be found in Appendix B

Source: EMSI

Table 58: Tourism Cluster, Top 25 Occupations by 5-digit SOC

Top 25 Occupations in Tourism Cluster										
SOC (5-digit)	Description	Employed in Industry Group (2011)	Employed in Industry Group (2016)	Employed in Industry Group (2021)	Change (2011 - 2016)	% Change (2011 - 2016)	Change (2016 - 2021)	% Change (2016 - 2021)	% of Total Jobs in Industry Group (2016)	Median Hourly Earnings (2016)
41-2031	Retail Salespersons	3,167	3,586	3,738	419	13%	152	4%	13%	$10.83
41-2011	Cashiers	2,971	3,023	3,041	52	2%	18	1%	11%	$9.98
35-3031	Waiters and Waitresses	2,469	2,797	2,882	328	13%	85	3%	10%	$9.36
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	2,209	2,354	2,520	145	7%	166	7%	9%	$9.98
35-2014	Cooks, Restaurant	1,176	1,397	1,508	221	19%	111	8%	5%	$11.99
43-5081	Stock Clerks and Order Fillers	1,245	1,266	1,298	21	2%	32	3%	5%	$11.15
41-1011	First-Line Supervisors of Retail Sales Workers	1,122	1,157	1,159	35	3%	2	0%	4%	$18.23
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	607	663	705	56	9%	42	6%	2%	$15.09
35-3011	Bartenders	566	658	698	92	16%	40	6%	2%	$9.38
35-2021	Food Preparation Workers	611	657	693	46	8%	36	5%	2%	$10.51
35-2011	Cooks, Fast Food	648	633	597	(15)	(2%)	(36)	(6%)	2%	$9.41
35-9021	Dishwashers	508	552	549	44	9%	(3)	(1%)	2%	$9.54
35-3022	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	467	502	522	35	7%	20	4%	2%	$9.38
37-2012	Maids and Housekeeping Cleaners	438	441	422	3	1%	(19)	(4%)	2%	$10.04
11-1021	General and Operations Managers	376	408	414	32	9%	6	1%	1%	$50.21
35-9031	Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	340	390	407	50	15%	17	4%	1%	$9.39
35-9011	Dining Room and Cafeteria Attendants and Bartender Helpers	295	332	345	37	13%	13	4%	1%	$9.32
43-1011	First-Line Supervisors of Office and Administrative Support	273	286	294	13	5%	8	3%	1%	$25.66
43-4081	Hotel, Motel, and Resort Desk Clerks	274	275	263	1	0%	(12)	(4%)	1%	$10.39
37-2011	Maids and Housekeeping Cleaners	224	241	247	17	8%	6	2%	1%	$12.76
43-4051	Representatives	234	236	237	2	1%	1	0%	1%	$16.33
11-9051	Food Service Managers	219	209	197	(10)	(5%)	(12)	(6%)	1%	$22.17
35-2015	Cooks, Short Order	191	199	196	8	4%	(3)	(2%)	1%	$10.86
29-2052	Pharmacy Technicians	187	199	210	12	6%	11	6%	1%	$15.08
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	190	189	182	(1)	(1%)	(7)	(4%)	1%	$13.83

Source: EMSI

Healthcare Services Cluster

This cluster is incudes all of health and social services industries but excludes biosciences which are examined as a separate cluster. Biosciences includes pharmaceutical and medical-related manufacturing, and research and development related to life sciences. The two are often related but also have unique characteristics, needs, and opportunities.

Key Findings

- This cluster currently makes up a significant 14% of the seCTer region economy with 20,846 jobs in 2016 and contributes about 8.4% or $1,217,181,099, to the entire seCTer region GRP.
- The largest 6-digit NAICS industry within the cluster is General Medical and Surgical Hospitals, with 4,565, or 22% of jobs in 2016. This industry specifically contributes $372 million to seCTer GRP. In terms of employment nursing care facilities with 2,773 employees and office of physicians (except mental health specialists) with 2,017 employees add significantly to this cluster.
- The Healthcare Services cluster within the seCTer region has shown slight growth over the past 5 years adding about 590 jobs, a 3% increase, and is projected to continue to grow by another 1,551 jobs in the upcoming 5-year period, a 7% increase. In comparison this cluster has grown in Connecticut by more than 17,000 jobs, a 6% increase, over the past 5-year period and by about 14% across the United States. Growth in the cluster was slowed by job losses within General Medical and Surgical Hospitals and nursing care facilities.
- Within this cluster, average earnings for 2016 in the seCTer Region were $56,880, which were on par with the cluster in the US but lower than that in Connecticut. The seCTer average in earnings in the cluster are also slightly lower than the average earnings overall, for all industries combined in the region.
- About 27% of employees, or 5,577 people, within this cluster work as Registered Nurses, Personal Care Aides, and Nursing Assistants, with median hourly earnings of $35, $12, and $14, respectively.

Findings from Focus Groups

Challenges

- Consolidation within the industry has forced smaller healthcare providers to scramble to align with regional providers, creating uncertainty around the future of small providers and job security for their employees.
- Workforce attraction and retention is a major issue with many organizations dealing with constant staff turnover and instability. Pay disparities make worker retention a challenge. Small practices lose staff to hospitals due to opportunities for higher pay through longer shifts and third-shift differentials as well as the perception of better pay outside Connecticut.
- Certified Medical Assistants are needed but the certification program is expensive. People opt to go straight to RN.
- Keeping up with state and federal mandates in an ongoing challenge.
- Limited cultural diversity among staff is misaligned with patient base and there is limited availability of qualified foreign language interpreters.
- The region has seen a growing number of young people who are homeless and in need or services.
- Global competition among non-profits for donations challenges local organizations to prove their value.

Opportunities

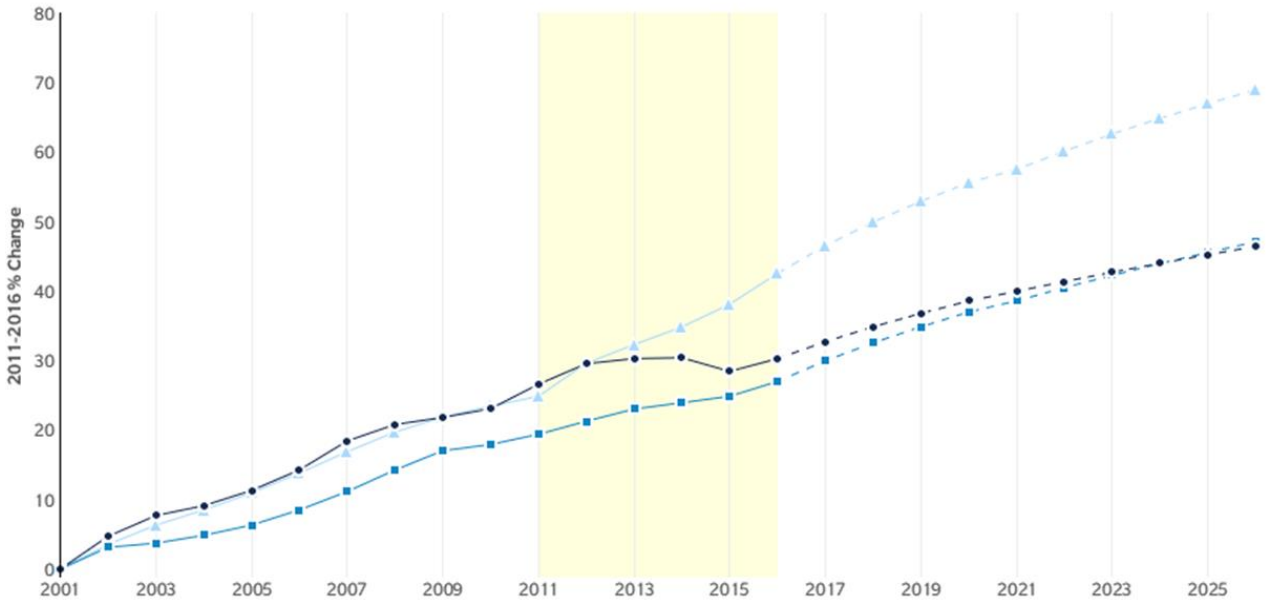
- Community paramedicine is an opportunity to provide better services to community residents

- Telemedicine is an opportunity for provider cost savings and allows better access to healthcare for rural residents
- United Community and Family Services (UCFS) is a community-based organization offering a variety of healthcare and outreach services that has experienced strong growth in recent years

What This Means for Regional Economic Growth Strategies

The size of the cluster in the region and projections for national and regional growth make this an important cluster as a primary target for seCTer. As consolidations and re-alignments among system providers stabilize, new opportunities to grow the cluster will emerge and take hold. Strategies should focus on workforce training, recruitment, and retention. Opportunities to leverage a region-wide, holistic initiative around health, workforce, economy, community, and food/agriculture through a "Healthy Region initiative" should be examined as it will serve residents, workers, providers, businesses and communities, and provide a positive brand around quality of place.

Healthcare Services Employment



Region	2011 Jobs	2016 Jobs	Change	% Change	2016 Average Earnings
seCTer Region	20,256	20,846	590	3%	$56,880
Connecticut	268,895	286,035	17,140	6%	$61,594
United States	18,484,253	21,103,373	2,619,120	14%	$57,812

Figure 7: Healthcare Services Cluster Employment Trends

Table 59: Healthcare Services Cluster, Change in Employment, 2011, 2016, 2021

Past, Present, and Projected Industry Jobs							
Total	2011 Jobs	2016 Jobs	2021 Jobs	2011 - 2016 Change	2011 - 2016 % Change	2016 - 2021 Change	2016 - 2021 % Change
Healthcare Services Cluster	20,256	20,846	22,397	590	3%	1,551	7%
seCTer Region	148,747	146,184	146,417	(2,563)	(2%)	233	0%
Healthcare Services as Percent of seCTer Region	14%	14%	15%	-	-	-	-
Connecticut	1,797,758	1,868,407	1,906,851	70,649	4%	38,444	2%
U.S.	145,672,482	158,866,954	166,098,861	13,194,472	9%	7,231,907	5%

Source: EMSI

Table 60: Healthcare Services Cluster by 6-digit NAICS Industry

Healthcare Services Cluster Detail									
NAICS (6-digit)	Description	2011 Jobs	2016 Jobs	2011-2016 Change	2011-2016 % Change	2016 Location Quotient	Regional Multiplier	Estimated Employees per Establishment*	GRP
622110	General Medical and Surgical Hospitals	4,766	4,565	(201)	(4%)	1.06	1.3656	1,923	$371,560,656
623110	Nursing Care Facilities (Skilled Nursing Facilities)	2,909	2,773	(136)	(5%)	1.82	1.1898	134	$141,090,886
621111	Offices of Physicians (except Mental Health Specialists)	1,985	2,107	122	6%	0.88	1.3783	12	$225,048,414
624310	Vocational Rehabilitation Services	1,362	1,458	96	7%	4.52	1.0719	17	$36,700,896
624120	Services for the Elderly and Persons with Disabilities	764	1,239	475	62%	0.78	1.0625	38	$27,906,783
624190	Other Individual and Family Services	920	1,151	231	25%	2.69	1.1126	20	$43,679,080
624410	Child Day Care Services	1,180	1,055	(125)	(11%)	0.90	1.0683	41	$24,167,277
623210	Developmental Disability Facilities	1,035	1,027	(8)	(1%)	2.79	1.1412	9	$40,594,768
621210	Offices of Dentists	985	959	(26)	(3%)	1.06	1.2439	13	$64,223,339
621610	Home Health Care Services	743	719	(24)	(3%)	0.53	1.1457	57	$39,934,236
623312	Assisted Living Facilities for the Elderly	399	427	28	7%	1.11	1.1443	31	$14,119,932
621340	Speech Therapists, and Audiologists	287	347	60	21%	0.98	1.1591	10	$18,834,702
621420	Substance Abuse Centers	235	308	73	31%	1.45	1.2388	41	$12,313,095
621112	Offices of Physicians, Mental Health Specialists	275	303	28	10%	4.98	1.2375	36	$20,736,417
621910	Ambulance Services	331	295	(36)	(11%)	1.76	1.1671	31	$12,823,101
621498	All Other Outpatient Care Centers	261	282	21	8%	1.91	1.3494	12	$19,857,149
623220	Substance Abuse Facilities	434	275	(159)	(37%)	1.34	1.1396	80	$10,583,039
623311	Continuing Care Retirement Communities	264	239	(25)	(9%)	0.54	1.1577	12	$9,981,567
623990	Other Residential Care Facilities	81	205	124	153%	1.35	1.1164	23	$5,944,273
621310	Offices of Chiropractors	96	126	30	31%	0.88		6	$6,305,152
621493	Emergency Centers	83	126	43	52%	0.98	1.4940	19	$13,728,115
621320	Offices of Optometrists	86	125	39	45%	0.95		7	$5,341,364
624110	Child and Youth Services	109	122	13	12%	0.62	1.4139	5	$5,980,805
624221	Temporary Shelters	112	121	9	8%	1.87	1.0713	14	$3,498,478
621399	Health Practitioners	84	106	22	26%	0.75	1.0965	7	$8,074,639
621330	Offices of Mental Health Practitioners (except Physicians)	91	105	14	15%	1.03	1.1769	20	$13,843,255
621511	Medical Laboratories	67	75	8	12%	0.41	1.2856	8	$4,921,129
621492	Kidney Dialysis Centers	73	51	(22)	(30%)	0.45	1.3173	21	$5,224,537
621410	Family Planning Centers	42	45	3	7%	2.05	1.3406	10	$3,457,475
624229	Other Community Housing Services	33	40	7	21%	1.17	1.0943	8	$1,563,576
621391	Offices of Podiatrists	35	27	(8)	(23%)	0.79	1.2346	3	$2,366,995
621512	Diagnostic Imaging Centers	54	19	(35)	(65%)	0.26	1.3323	22	$2,298,034
621999	Health Care Services	35	18	(17)	(49%)	0.26	1.0776	8	$477,932
	Total	20,256	20,846	590	3%				$1,217,181,099

*Employees per establishment estimates reflect 2015 establishment data from New London County

Note: Any industry with less than 10 jobs in 2016 is not individually listed in this table, a full list of all industries included in the cluster can be found in Appendix B

Source: EMSI

Table 61: Healthcare Services Cluster, Top 25 Occupations by 5-digit SOC

Top 25 Occupations in Healthcare Services Cluster										
SOC (5-digit)	Description	Employed in Industry Group (2011)	Employed in Industry Group (2016)	Employed in Industry Group (2021)	Change (2011 - 2016)	% Change (2011 - 2016)	Change (2016 - 2021)	% Change (2016 - 2021)	% of Total Jobs in Industry Group (2016)	Median Hourly Earnings (2016)
29-1141	Registered Nurses	2,196	2,166	2,256	(30)	(1%)	90	4%	10%	$34.88
39-9021	Personal Care Aides	1,521	1,837	2,125	316	21%	288	16%	9%	$12.00
31-1014	Nursing Assistants	1,630	1,574	1,594	(56)	(3%)	20	1%	8%	$14.07
31-1011	Home Health Aides	544	576	668	32	6%	92	16%	3%	$12.78
29-2061	Vocational Nurses	583	563	575	(20)	(3%)	12	2%	3%	$25.18
21-1093	Social and Human Service Assistants	478	531	590	53	11%	59	11%	3%	$16.36
39-9011	Childcare Workers	563	503	489	(60)	(11%)	(14)	(3%)	2%	$9.39
31-9092	Medical Assistants	464	487	540	23	5%	53	11%	2%	$15.24
43-4171	Receptionists and Information Clerks	417	439	481	22	5%	42	10%	2%	$14.11
29-1069	Physicians and Surgeons, All Other	352	359	382	7	2%	23	6%	2%	$80.48
25-2011	Preschool Teachers, Except Special Education	358	340	365	(18)	(5%)	25	7%	2%	$14.01
43-9061	Office Clerks, General	331	338	365	7	2%	27	8%	2%	$15.69
11-9111	Medical and Health Services Managers	312	307	318	(5)	(2%)	11	4%	1%	$47.41
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	277	286	306	9	3%	20	7%	1%	$17.88
43-6013	Medical Secretaries	280	285	317	5	2%	32	11%	1%	$17.77
29-2021	Dental Hygienists	276	280	293	4	1%	13	5%	1%	$40.60
31-9091	Dental Assistants	272	276	294	4	1%	18	7%	1%	$20.56
43-1011	First-Line Supervisors of Office and Administrative Support Workers	263	275	296	12	5%	21	8%	1%	$25.66
37-2012	Maids and Housekeeping Cleaners	262	254	260	(8)	(3%)	6	2%	1%	$10.04
21-1015	Rehabilitation Counselors	230	253	280	23	10%	27	11%	1%	$18.16
11-9151	Social and Community Service Managers	205	237	264	32	16%	27	11%	1%	$28.04
29-1123	Physical Therapists	219	237	263	18	8%	26	11%	1%	$39.07
21-1021	Child, Family, and School Social Workers	193	234	268	41	21%	34	15%	1%	$29.45
29-2041	Emergency Medical Technicians and Paramedics	240	230	241	(10)	(4%)	11	5%	1%	$19.11
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	220	226	241	6	3%	15	7%	1%	$12.76

Source: EMSI

Defense Cluster

This cluster includes ship building (driven by military ship and submarine manufacturing at Electric Boat) and federal government military related employment driven by the Federal Military Base. Because of its size, historic importance to the region, and unique needs relative to government and military operations we examine it as a separate cluster from advanced manufacturing. However, in many respects, particularly in terms of workforce, the clusters are related.

Key Findings

- This cluster currently makes up about 13% of the seCTer region economy with 19,319 jobs in 2016 and contributes about 15% or $2,232,344,853 to the entire seCTer region GRP, the largest of any cluster.
- The largest 6-digit NAICS industry within the cluster is Ship Building and Repairing, with 10,439, or 54% of jobs in 2016. This industry specifically contributes $1,014,373,966 to seCTer GRP.
- The Defense cluster within the seCTer region has shown growth over the past 5 years adding 1,795 jobs,[8] about a 10% increase, the cluster is projected to continue growing by about 3% adding 558 jobs in the upcoming 5-year period based on historical data, however, recent and expected future contracts point to growth that is much higher[9].
- This cluster has grown in Connecticut by more than 2,000 jobs, a 7% increase. However, this cluster has declined slightly across the United States, over the past 5-year period, which contributes to a 2% decrease.
- Average earnings for 2016 in the seCTer Region were $91,548, significantly higher than average earnings for all industry sectors.
- 35% of employees, or 6,694 people, within this cluster work in Military Occupations with median hourly earnings of nearly $19. The remaining occupations are made of many skilled trades and mechanical engineers making this cluster extremely important for supporting high-skilled, high wage jobs in the region.

What This Means for Regional Economic Growth Strategies

As a large historic base of the regional economy, with strong growth in the past five years and growth expected to continue, plus significantly higher than average earnings among jobs in skilled and STEM related trades, the defense cluster should be a primary cluster to target and leverage for regional economic growth. It also should be considered integral to and within efforts in the region to support and grow advanced manufacturing. To further leverage this cluster, regional economic development efforts should continue to focus on workforce development to support both new growth and replacement of retiring workers and also focus on quality of place factors integrating land use, housing, and transportation needs of employers in this cluster with communities and the region. Because of this cluster's reliance on federal military contracts it is important for the regional and local economic and workforce development community to maintain ongoing communications with employers and federal representatives regarding future employment projections and needs.

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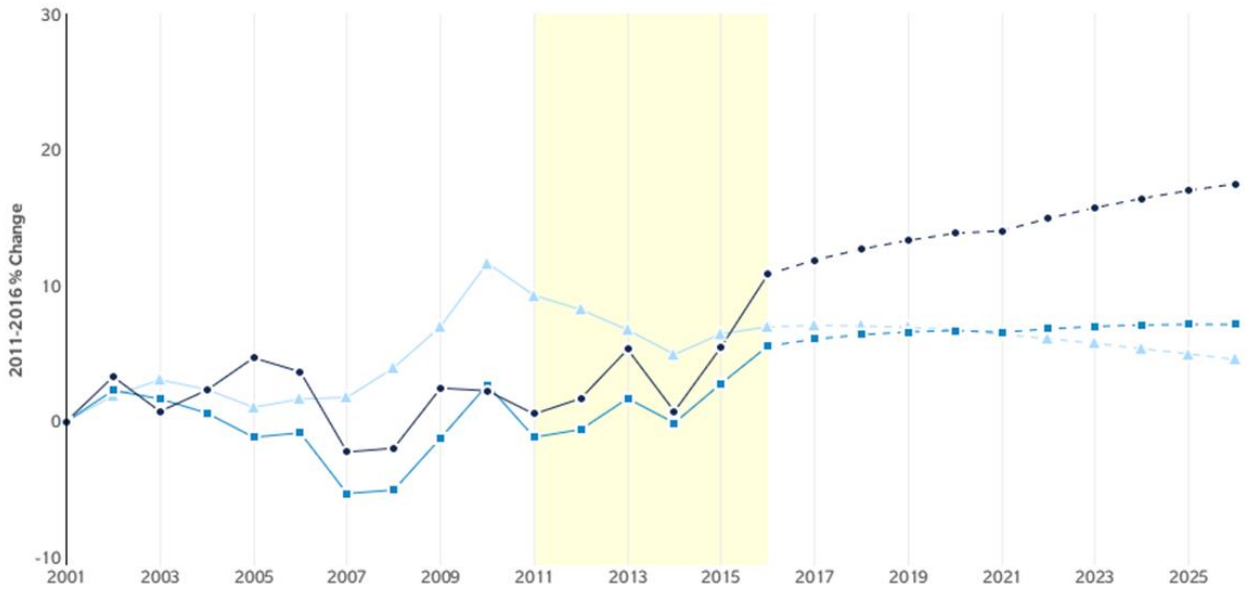
[8] Federal Government military jobs are not covered by the Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW). Camoin proprietary data provider EMSI attempts to cover jobs that fall under an employer-employee relationship but are not covered under QCEW. After reviewing data from the Commander, Navy Installations Command (CNIC) website, we are confident that EMSI is reporting Federal Government military jobs in a comparable manner.

[9] "Electric Boat expects to sustain this hiring surge, as the company forecasts adding 4,000 employees over the next 15 years. Electric Boat's supplier base also has begun to add staff to ensure the capacity to support Electric Boat's growth." From Eastern CT Workforce Investment Board (EWIB), Comprehensive Four-Year Plan: 2016-2020.

Defense Employment



Region	2011 Jobs	2016 Jobs	Change	% Change	2016 Average Earnings
seCTer Region	17,524	19,319	1,795	10%	$91,548
Connecticut	32,100	34,281	2,181	7%	$84,660
United States	4,485,714	4,390,626	-95,088	-2%	$84,449

Figure 8: Defense Cluster Employment Trends

Table 62: Defense Cluster, Change in Employment, 2011, 2016, 2021

Past, Present, and Projected Industry Jobs							
Total	2011 Jobs	2016 Jobs	2021 Jobs	2011 - 2016 Change	2011 - 2016 % Change	2016 - 2021 Change	2016 - 2021 % Change
Defense Services Cluster	17,524	19,319	19,877	1,795	10%	558	3%
seCTer Region	148,747	146,184	146,417	(2,563)	(2%)	233	0%
Defense as Percent of seCTer Region	12%	13%	14%	-	-	-	-
Connecticut	1,797,758	1,868,407	1,906,851	70,649	4%	38,444	2%
U.S.	145,672,482	158,866,954	166,098,861	13,194,472	9%	7,231,907	5%

Source: EMSI

Note: Based on recent and expected future military contracts employment increases significantly beyond what is projected in this data are anticipated.

Table 63: Defense Cluster by 6-digit NAICS Industry

Defense Cluster Detail									
NAICS (6-digit)	Description	2011 Jobs	2016 Jobs	2011-2016 Change	2011-2016 % Change	2016 Location Quotient	Regional Multiplier	Estimated Employees per Establishment*	GRP
336611	Ship Building and Repairing	8,058	10,439	2,381	30%	112.10	1.4797	1,894	$1,014,373,966
901200	Federal Government, Military	7,425	6,694	(731)	(10%)	3.59	1.5299	6,694	$987,569,082
901199	Federal Government, Civilian, Excluding Postal Service	2,041	2,186	145	7%	1.05	1.4883	63	$230,401,806
	Total	17,524	19,319	1,795	10%				$2,232,344,853

*Employees per establishment estimates reflect 2015 establishment data from New London County

Note: Any industry with less than 10 jobs in 2016 is not reflected in this table, a full list of all industries included in the cluster can be found in Appendix B

Source: EMSI

Table 64: Defense Cluster, Top 25 Occupations by 5-digit SOC

Top 25 Occupations in Defense Cluster										
SOC (5-digit)	Description	Employed in Industry Group (2011)	Employed in Industry Group (2016)	Employed in Industry Group (2021)	Change (2011 - 2016)	% Change (2011 - 2016)	Change (2016 - 2021)	% Change (2016 - 2021)	% of Total Jobs in Industry Group (2016)	Median Hourly Earnings (2016)
55-9999	Military occupations	7,425	6,694	6,696	(731)	(10%)	2	0%	35%	$18.75
51-4121	Welders, Cutters, Solderers, and Brazers	465	590	645	125	27%	55	9%	3%	$19.92
51-2092	Team Assemblers	425	557	596	132	31%	39	7%	3%	$13.84
51-1011	First-Line Supervisors of Production and Operating Workers	422	552	588	130	31%	36	7%	3%	$29.01
17-2141	Mechanical Engineers	387	518	556	131	34%	38	7%	3%	$38.98
47-2152	Plumbers, Pipefitters, and Steamfitters	357	462	490	105	29%	28	6%	2%	$26.12
17-3013	Mechanical Drafters	323	404	402	81	25%	(2)	(0%)	2%	$27.93
47-2111	Electricians	301	392	420	91	30%	28	7%	2%	$24.88
51-4041	Machinists	244	333	368	89	36%	35	11%	2%	$21.65
47-2031	Carpenters	225	295	313	70	31%	18	6%	2%	$20.52
43-5061	Production, Planning, and Expediting Clerks	193	250	264	57	30%	14	6%	1%	$22.36
11-1021	General and Operations Managers	174	220	229	46	26%	9	4%	1%	$50.21
51-9122	Painters, Transportation Equipment	142	183	196	41	29%	13	7%	1%	$27.38
51-9198	Helpers--Production Workers	142	178	184	36	25%	6	3%	1%	$12.53
51-2091	Fiberglass Laminators and Fabricators	141	177	197	36	26%	20	11%	1%	$17.84
13-1199	Business Operations Specialists, All Other	153	176	179	23	15%	3	2%	1%	$30.59
13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	138	170	174	32	23%	4	2%	1%	$28.59
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	129	167	177	38	29%	10	6%	1%	$13.83
51-2041	Structural Metal Fabricators and Fitters	129	166	182	37	29%	16	10%	1%	$23.14
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	127	165	174	38	30%	9	5%	1%	$20.51
11-9199	Managers, All Other	123	144	145	21	17%	1	1%	1%	$37.75
43-9061	Office Clerks, General	106	133	138	27	25%	5	4%	1%	$15.69
49-3051	Motorboat Mechanics and Service Technicians	102	132	136	30	29%	4	3%	1%	$22.95
43-5081	Stock Clerks and Order Fillers	100	129	137	29	29%	8	6%	1%	$11.15
11-3051	Industrial Production Managers	97	126	133	29	30%	7	6%	1%	$49.03

Source: EMSI

Energy and Environment Cluster

This cluster was defined broadly for this analysis and includes all utilities related to power generation; waste management; skilled trades typically relied upon including heating, plumbing, and electrical trades-intensive industries; manufacturing related to fuel/energy production including chemicals and fuel production, and equipment, machinery and devices; warehousing and distributions related to energy and environment; and professional services including engineering, testing, R&D, and consulting services. This sector is not specifically designated within the NAICS code system and includes a compilation of industries across many sectors which are typically included in energy and environment. As a result, the jobs and economic data in this section likely overstate the presence of the cluster in the region. For example, all "engineers" are included in this cluster while in fact many engineers work in completely different clusters including defense in the region. This challenge of measuring the energy and environment cluster is not unique to the seCTer region.

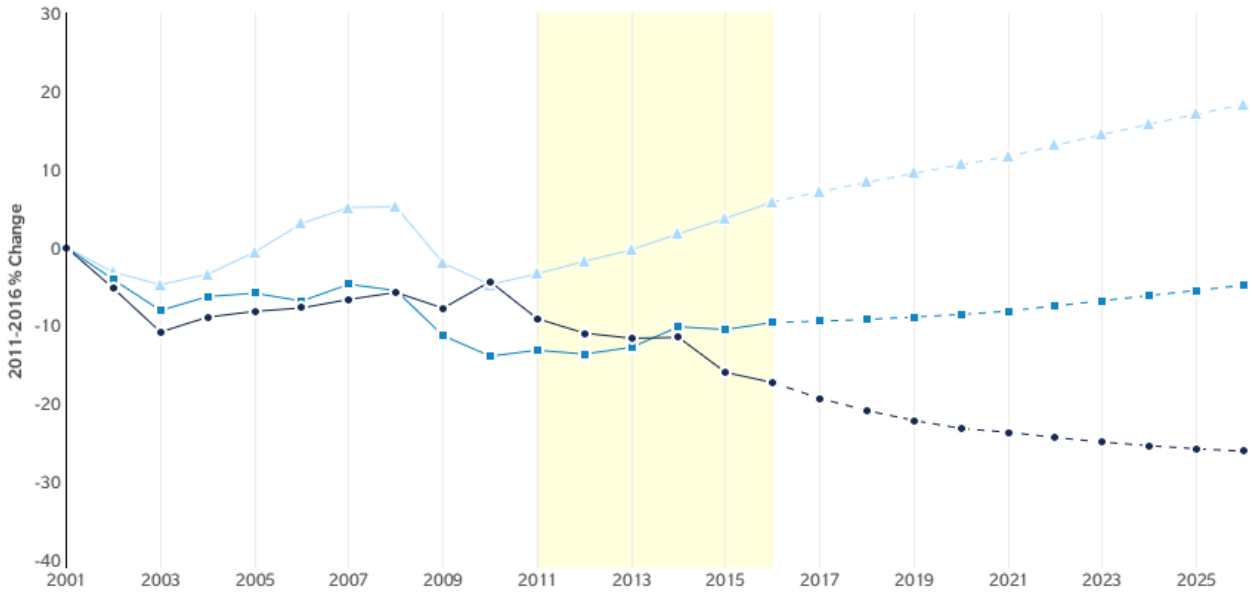
Key Findings

- This cluster makes up between 3% and 4% of the seCTer region economy with 5,513 jobs in 2016 and contributes 9% or $1,323,743,124 to the entire seCTer region GRP.
- The largest 6-digit NAICS industry within the cluster is Nuclear Electric Power Generation, with over 1,000 jobs, or 18% of jobs in 2016. This industry specifically contributes $757,449,697 to seCTer GRP.
- The Energy and Environment cluster within the seCTer region has declined over the past 5 years by 546 jobs, a 9% decrease and is projected to decrease by another 423 jobs in the upcoming 5-year period which would contribute to an 8% decrease. Job losses have been driven by losses in the nuclear industry, electrical distribution, and engineering services. Conversely, this cluster has shown growth and is also projected to continuing growing in Connecticut by over 1,000 jobs, a small 2% increase, over the next 5-year period. This cluster is also projected to grow 5% across the United States, adding over 400,000 jobs over the next 5-year period.
- The most prominent occupations within this cluster are Nuclear Engineers, Electricians, and Plumbers, Pipefitters, and Steamfitters, employing nearly 800 people, cumulatively in 2016.
- Average earnings for 2016, only within the seCTer Region are highest at $106,811, whereas earnings in Connecticut are $100,008 and $92,335 in the United States.

What This Means for Regional Economic Growth Strategies

The Energy and Environment cluster in the region is small and driven mostly by nuclear power generation and related industries. It also does not exhibit characteristics of a cluster in the region with related industries interacting within a network of stakeholders including businesses, entrepreneurs, educators, researchers, and service providers all supporting its growth. While this is an industry the region may want to continue to monitor as it is important globally and in other parts of the US, outside of its connections to other industry sectors such as manufacturing and skilled trades we do not recommend that this be a primary industry area for the region to focus on. Much more work in building regional assets to support its growth would need to occur relative to other focus areas.

Energy and Environment Employment



Region	2011 Jobs	2016 Jobs	Change	% Change	2016 Average Earnings
seCTer Region	6,059	5,513	-546	-9%	$106,811
Connecticut	78,582	81,805	3,223	4%	$100,008
United States	6,754,568	7,397,575	643,007	10%	$92,335

Figure 9: Energy and Environment Cluster Employment Trends

Table 65: Energy and Environment Cluster, Change in Employment, 2011, 2016, 2021

Past, Present, and Projected Industry Jobs							
Total	2011 Jobs	2016 Jobs	2021 Jobs	2011 - 2016 Change	2011 - 2016 % Change	2016 - 2021 Change	2016 - 2021 % Change
Energy and Environment Cluster	6,059	5,513	5,090	(546)	(9%)	(423)	(8%)
seCTer Region	148,747	146,184	146,417	(2,563)	(2%)	233	0%
as Percent of seCTer Region	4%	4%	3%	-	-	-	-
Connecticut	1,797,758	1,868,407	1,906,851	70,649	4%	38,444	2%
U.S.	145,672,482	158,866,954	166,098,861	13,194,472	9%	7,231,907	5%

Source: EMSI

Table 66: Energy and Environment Cluster by 6-digit NAICS Industry

Energy and Environment Cluster Detail									
NAICS (6-digit)	Description	2011 Jobs	2016 Jobs	2011-2016 Change	2011-2016 % Change	2016 Location Quotient	Multiplier	Estimated Employees per Establishment*	GRP
221113	Nuclear Electric Power Generation	1,223	1,012	(211)	(17%)	23.11	2.7416	546	$757,449,697
541330	Engineering Services	1,037	866	(171)	(16%)	0.94	1.4678	12	$113,268,202
238220	Plumbing, Heating, and Air-Conditioning Contractors	589	691	102	17%	0.66	1.2281	7	$49,855,448
238210	Electrical Contractors and Other Wiring Installation Contractors	553	558	5	1%	0.61	1.2062	7	$44,020,966
454310	Fuel Dealers	336	336	0	0%	4.67	1.3180	12	$27,926,447
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)	322	299	(23)	(7%)	0.71	1.8612	10	$52,688,014
335929	Other Communication and Energy Wire Manufacturing	231	230	(1)	(0%)	18.49	1.3468	230	$31,442,682
237130	Power and Communication Line and Related Structures Construction	172	228	56	33%	1.33	1.4882	37	$47,709,293
334514	Totalizing Fluid Meter and Counting Device Manufacturing	136	171	35	26%	18.21	1.2639	171	$23,713,223
423720	Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers	97	106	9	9%	1.23	1.3396	9	$11,293,128
562111	Solid Waste Collection	84	104	20	24%	0.74	1.4863	16	$16,722,366
541380	Testing Laboratories	152	101	(51)	(34%)	0.64	1.4129	7	$8,667,077
562213	Solid Waste Combustors and Incinerators	67	89	22	33%	17.13	1.5915	37	$11,696,961
335931	Current-Carrying Wiring Device Manufacturing	64	79	15	23%	2.59	1.2440	41	$4,688,691
221122	Electric Power Distribution	125	74	(51)	(41%)	0.37	1.8459	36	$34,588,187
423930	Recyclable Material Merchant Wholesalers	72	74	2	3%	0.64	1.2342	4	$8,645,863
221310	Water Supply and Irrigation Systems	68	61	(7)	(10%)	1.51	1.2560	9	$6,298,620
335313	Switchgear and Switchboard Apparatus Manufacturing	47	60	13	28%	1.84	1.2412	25	$7,647,704
423610	Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers	90	54	(36)	(40%)	0.36	1.3198	8	$8,570,745
541690	Other Scientific and Technical Consulting Services	39	51	12	31%	0.21	1.1803	4	$3,420,902
423690	Other Electronic Parts and Equipment Merchant Wholesalers	57	48	(9)	(16%)	0.37	1.5465	19	$9,592,214
562910	Remediation Services	15	36	21	140%	0.46	1.5403	7	$4,460,352
541620	Environmental Consulting Services	31	28	(3)	(10%)	0.30	1.1736	5	$2,122,755
237110	Water and Sewer Line and Related Structures Construction	58	26	(32)	(55%)	0.16	1.3623	4	$8,151,254
334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables	14	22	8	57%	0.37	1.1874	22	$723,193
221210	Natural Gas Distribution	<10	20	Insf. Data	Insf. Data	0.19	3.5549	20	$22,172,767
562991	Septic Tank and Related Services	18	19	1	6%	0.75	1.9401	4	$5,528,462
562119	Other Waste Collection	<10	12	Insf. Data	Insf. Data	1.12	1.1775	12	$677,911
	Total	6,059	5,513	(546)	(9%)				$1,323,743,124

*Employees per establishment estimates reflect 2015 establishment data from New London County

Note: Any industry with less than 10 jobs in 2016 is not individually listed in this table, a full list of all industries included in the cluster can be found in Appendix B
Source: EMSI

Table 67: Energy and Environment Cluster, Top 25 Occupations by 5-digit SOC

Top 25 Occupations in Energy and Environment Cluster										
SOC (5-digit)	Description	Employed in Industry Group (2011)	Employed in Industry Group (2016)	Employed in Industry Group (2021)	Change (2011 - 2016)	% Change (2011 - 2016)	Change (2016 - 2021)	% Change (2016 - 2021)	% of Total Jobs in Industry Group (2016)	Median Hourly Earnings (2016)
17-2161	Nuclear Engineers	367	306	147	(61)	(17%)	(159)	(52%)	6%	$54.96
47-2111	Electricians	265	272	205	7	3%	(67)	(25%)	5%	$24.88
47-2152	Plumbers, Pipefitters, and Steamfitters	171	206	205	35	20%	(1)	(0%)	4%	$26.12
17-2051	Civil Engineers	197	168	162	(29)	(15%)	(6)	(4%)	3%	$39.07
11-1021	General and Operations Managers	168	159	157	(9)	(5%)	(2)	(1%)	3%	$50.21
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	131	155	157	24	18%	2	1%	3%	$22.90
43-9061	Office Clerks, General	128	121	116	(7)	(5%)	(5)	(4%)	2%	$15.69
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	125	118	114	(7)	(6%)	(4)	(3%)	2%	$17.88
47-2061	Construction Laborers	107	114	133	7	7%	19	17%	2%	$16.27
53-3032	Heavy and Tractor-Trailer Truck Drivers	98	107	110	9	9%	3	3%	2%	$21.20
17-2141	Mechanical Engineers	121	106	106	(15)	(12%)	0	0%	2%	$38.98
33-9032	Security Guards	115	95	55	(20)	(17%)	(40)	(42%)	2%	$12.08
11-9041	Architectural and Engineering Managers	100	85	72	(15)	(15%)	(13)	(15%)	2%	$62.44
17-2071	Electrical Engineers	102	83	69	(19)	(19%)	(14)	(17%)	2%	$40.66
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	77	76	76	(1)	(1%)	0	0%	1%	$28.63
19-4051	Nuclear Technicians	92	76	44	(16)	(17%)	(32)	(42%)	1%	$40.29
51-1011	First-Line Supervisors of Production and Operating Workers	93	76	60	(17)	(18%)	(16)	(21%)	1%	$29.01
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	78	75	79	(3)	(4%)	4	5%	1%	$13.83
43-4051	Customer Service Representatives	76	67	66	(9)	(12%)	(1)	(1%)	1%	$16.33
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	79	66	71	(13)	(16%)	5	8%	1%	$27.22
43-3031	Bookkeeping, Accounting, and Auditing Clerks	72	65	60	(7)	(10%)	(5)	(8%)	1%	$18.73
51-2022	Electrical and Electronic Equipment Assemblers	78	64	68	(14)	(18%)	4	6%	1%	$14.60
51-8011	Nuclear Power Reactor Operators	74	63	45	(11)	(15%)	(18)	(29%)	1%	$50.56
11-9021	Construction Managers	64	59	56	(5)	(8%)	(3)	(5%)	1%	$34.53
43-1011	First-Line Supervisors of Office and Administrative Support Workers	60	55	53	(5)	(8%)	(2)	(4%)	1%	$25.66

Source: EMSI

Bioscience Cluster

This cluster is incudes the industries of pharmaceutical manufacturing, medical device manufacturing, research and development related to life sciences. It excludes healthcare and social services which are included within a separate healthcare cluster.

Key Findings

- This cluster currently makes up about 2% of the seCTer region economy with 2,994 jobs in 2016 and contributes about 8.5% or $1,244,529,655 to the entire seCTer region GRP.
- The largest 6-digit NAICS industry within the cluster is Medicinal and Botanical Manufacturing, with 1,367, or 46% of jobs in 2016 followed by 533 jobs within biotechnology R&D.
- The Bioscience cluster within the seCTer region has shown significant decline over the past 5 years by over 1,000 jobs, at 25% decrease. Much of this can attributed to the recent and noteworthy loss in jobs at Pfizer, which includes both manufacturing and R&D related employment. The industry is projected to continue to decline by another 961 jobs in the upcoming 5-year period which would contribute to another 32% decrease. This cluster has also shown decline in Connecticut between 2011 and 2016 by about 14% or the loss of 2,715 jobs. It is also expected to decline Connecticut by more than 1,000 jobs over the next 5 years. Therefore, decline within the seCTer region is more substantial than decline within the entire state. However, nationally this cluster has grown over the past 5 years and is expected to grow another 5% across the United States, adding about 61,300 new jobs over the next 5-year period.
- 334 persons in this cluster were employed as Medical Scientists (Except Epidemiologists) or Chemists, the largest two occupation groups.
- Average earnings for 2016 in the seCTer Region in this cluster were just about $195,000, far exceeding average earnings for most other industries. Average earnings in the seCTer Region for this cluster exceeded both Connecticut and the United States.

Findings from Focus Groups

Challenges

- Many biotech companies are moving or expanding in Cambridge, MA, due to the existing and growing cluster in the Boston area and existence of universities. Pfizer, also recently moved a substantial number of jobs from the seCTer Region to the Cambridge location.
- Almost all individuals and companies within the region's bioscience cluster are located in Southeastern Connecticut because of Pfizer.
- Lab space is not readily available in the region for entrepreneurs and small to medium companies.
- Access to Electronic Research Library is critical to entrepreneurs and small companies yet difficult to afford/access
- Starting a biotech company in the region is high risk.
- A lack of research institutions in the regions limits talent available. There is a lack of research anchor like that present in New Haven, Boston, and Providence
- Bioscience relies heavily on government funding; funding opportunities in Connecticut are lower than in other states like Massachusetts
- Current talent pool is aging, and there is no significant quality of place draw for new/younger talent.

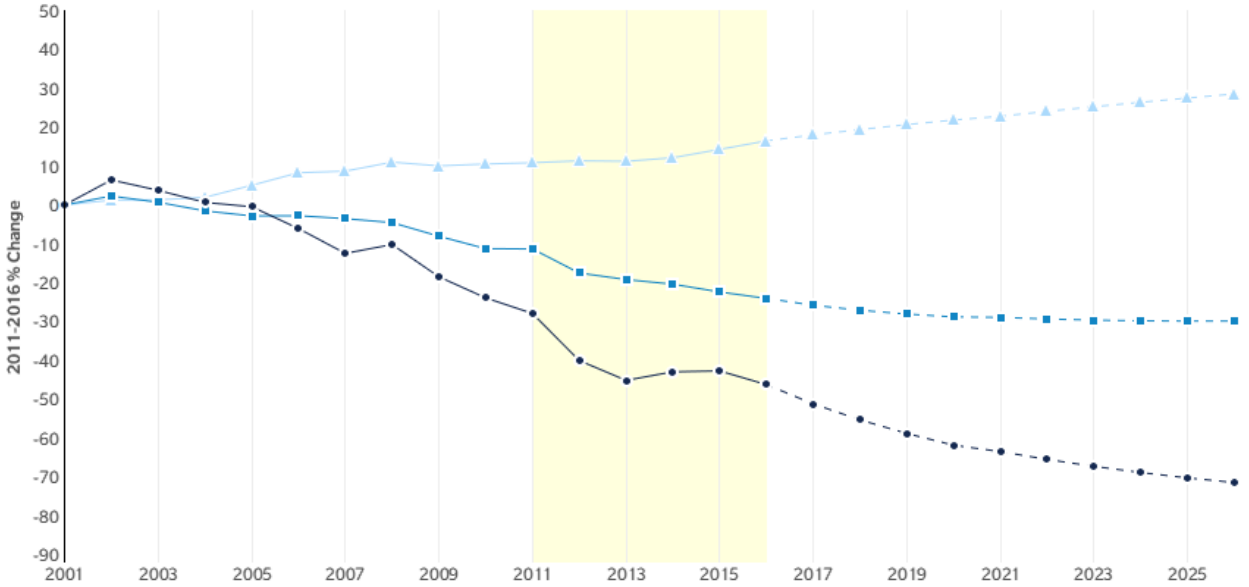
Opportunities

- The CURE Innovation Commons is an important new asset for recruiting and supporting startups.
- UConn–Avery Point has incubator lab space but is currently occupied by only one company, which may present an opportunity for attracting more companies. Access to the Electronic Research Library is a key advantage to locating there
- Sophisticated research can become more decentralized due to telecommuting and advances in instrumentation, meaning that location becomes less important. Businesses can start in the region even if the workforce isn't available.
- Southeastern Connecticut has a cost advantage over nearby bioscience hubs such as New Haven and Cambridge.
- Mentoring opportunities to help start and grow small businesses are needed.
- Support and strengthen the network of existing entrepreneurs in the region – there is a good small mix of talented bioscience related entrepreneurs committed to remaining in and growing the sector.

What This Means for Regional Economic Growth Strategies

Though small in terms of employment numbers, this is a niche cluster in which the region has had a historical strength, primarily due to the presence of Pfizer. It is characterized by high levels of skills and talent, high wages, and driven by innovation. Though there have been recent declines due to reductions in the region by Pfizer, there are several strong small firms in the region along with talent workers and entrepreneurs. Avery Point (though underutilized), the recent addition of CURE, and a small network of individuals committed to the success of the cluster represent assets to build on. Keys to success will be to further support and leverage these distinct assets, improve quality of life infrastructure and amenities in the region to be able to attract and retain talent and entrepreneurs, and begin to develop synergies with the growing healthcare cluster in the region. This should remain among the primary clusters to focus on in the region due to historic strength, global and national importance, innovation, and high wages.

Bioscience Employment



Region	2011 Jobs	2016 Jobs	Change	% Change	2016 Average Earnings
seCTer Region	4,014	2,994	-1,020	-25%	$194,974
Connecticut	18,899	16,184	-2,715	-14%	$152,963
United States	1,073,779	1,128,281	54,502	5%	$145,427

Figure 10: Bioscience Cluster Employment Trends

Table 68: Bioscience Cluster, Change in Employment, 2011, 2016, 2021

Past, Present, and Projected Industy Jobs							
Total	2011 Jobs	2016 Jobs	2021 Jobs	2011 - 2016 Change	2011 - 2016 % Change	2016 - 2021 Change	2016 - 2021 % Change
Bioscience Services Cluster	4,014	2,994	2,033	(1,020)	(25%)	(961)	(32%)
seCTer Region	148,747	146,184	146,417	(2,563)	(2%)	233	0%
Bioscience as Percent of seCTer Region	3%	2%	1%	-	-	-	-
Connecticut	1,797,758	1,868,407	1,906,851	70,649	4%	38,444	2%
U.S.	145,672,482	158,866,954	166,098,861	13,194,472	9%	7,231,907	5%

Source: EMSI

Table 69: Bioscience Cluster by 6-digit NAICS Industry

Bioscience Cluster Detail									
NAICS (6-digit)	Description	2011 Jobs	2016 Jobs	2011-2016 Change	2011-2016 % Change	2016 Location Quotient	Regional Multiplier	Estimated Employees per Establishment*	GRP
325411	Medicinal and Botanical Manufacturing	2,088	1,367	(721)	(35%)	54.32	2.2842	783	$774,992,365
541711	Research and Development in Biotechnology	1,015	533	(482)	(47%)	3.53	2.0059	101	$121,410,091
325412	Pharmaceutical Preparation Manufacturing	298	431	133	45%	2.29	2.1742	431	$254,851,761
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)	322	299	(23)	(7%)	0.71	1.8612	10	$52,688,014
339112	Surgical and Medical Instrument Manufacturing	173	270	97	56%	2.38	1.2639	125	$23,753,771
339113	Surgical Appliance and Supplies Manufacturing	119	92	(27)	(23%)	0.96	1.3734	15	$16,833,653
	Total	4,014	2,994	(1,020)	(25%)				$1,244,529,655

*Employees per establishment estimates reflect 2015 establishment data from New London County

Note: Any industry with less than 10 jobs in 2016 is not individually listed in this table, a full list of all industries included in the cluster can be found in Appendix B

Source: EMSI

Table 70: Bioscience Cluster, Top 25 Occupations by 5-digit SOC

Top 25 Occupations in Bioscience Industry Cluster										
SOC (5-digit)	Description	Employed in Industry Group (2011)	Employed in Industry Group (2016)	Employed in Industry Group (2021)	Change (2011 - 2016)	% Change (2011 - 2016)	Change (2016 - 2021)	% Change (2016 - 2021)	% of Total Jobs in Industry Group (2016)	Median Hourly Earnings (2016)
19-1042	Medical Scientists, Except Epidemiologists	279	197	131	(82)	(29%)	(66)	(34%)	7%	$56.66
19-2031	Chemists	193	142	79	(51)	(26%)	(63)	(44%)	5%	$38.42
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	138	111	69	(27)	(20%)	(42)	(38%)	4%	$20.51
51-9111	Packaging and Filling Machine Operators and Tenders	156	111	66	(45)	(29%)	(45)	(41%)	4%	$14.57
11-9121	Natural Sciences Managers	125	91	58	(34)	(27%)	(33)	(36%)	3%	$65.26
51-1011	First-Line Supervisors of Production and Operating Workers	99	80	50	(19)	(19%)	(30)	(38%)	3%	$29.01
11-1021	General and Operations Managers	99	75	50	(24)	(24%)	(25)	(33%)	3%	$50.21
51-9011	Chemical Equipment Operators and Tenders	96	75	40	(21)	(22%)	(35)	(47%)	2%	$18.30
19-4031	Chemical Technicians	87	64	36	(23)	(26%)	(28)	(44%)	2%	$23.60
17-2112	Industrial Engineers	77	61	42	(16)	(21%)	(19)	(31%)	2%	$40.07
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	85	60	36	(25)	(29%)	(24)	(40%)	2%	$17.17
51-2092	Team Assemblers	54	52	48	(2)	(4%)	(4)	(8%)	2%	$13.84
17-2141	Mechanical Engineers	71	50	37	(21)	(30%)	(13)	(26%)	2%	$38.98
19-4021	Biological Technicians	74	50	33	(24)	(32%)	(17)	(34%)	2%	$24.75
11-9199	Managers, All Other	62	44	28	(18)	(29%)	(16)	(36%)	1%	$37.75
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	62	44	30	(18)	(29%)	(14)	(32%)	1%	$17.88
11-3051	Industrial Production Managers	54	43	26	(11)	(20%)	(17)	(40%)	1%	$49.03
19-1021	Biochemists and Biophysicists	61	42	28	(19)	(31%)	(14)	(33%)	1%	$57.58
13-1041	Compliance Officers	48	36	22	(12)	(25%)	(14)	(39%)	1%	$33.08
11-2021	Marketing Managers	46	36	22	(10)	(22%)	(14)	(39%)	1%	$53.84
13-1199	Business Operations Specialists, All Other	51	35	23	(16)	(31%)	(12)	(34%)	1%	$30.59
43-9061	Office Clerks, General	47	35	25	(12)	(26%)	(10)	(29%)	1%	$15.69
11-9041	Architectural and Engineering Managers	47	35	24	(12)	(26%)	(11)	(31%)	1%	$62.44
13-2011	Accountants and Auditors	45	33	22	(12)	(27%)	(11)	(33%)	1%	$30.46
11-3031	Financial Managers	42	33	21	(9)	(21%)	(12)	(36%)	1%	$53.92

Source: EMSI

Agriculture, Fishing, and Food Production Cluster

This cluster is incudes all those related to food production and distribution including crop and animal production and fishing; and food and beverage related manufacturing, wholesale, and distribution. It excludes any retail and restaurant businesses. While they are part of the supply chain and ultimate end providers to the consumer market they are covered under a separate cluster.

Key Findings

- This cluster consistently makes up between 1% and 2% of the seCTer region employment with 2,144 jobs[10] and contributes about 1% or $175 million to the seCTer region GRP.
- The two largest 6-digit NAICS industry within the cluster is Animal Production and Aquaculture, with 846 jobs, or 39% of jobs in 2016, followed by Crop Production with 626 jobs, or 29%. Together, these industries contribute about $115 million to seCTer GRP.
- The Agriculture, Fishing, and Food Production cluster within the seCTer region has shown growth over the past 5 years adding about 181 jobs, about a 9% increase. Growth was driven by Animal Production and Aquaculture which added 314 jobs. The cluster is projected to continue growing by about 3% adding 60 jobs in the upcoming 5-year period. Similarly, this cluster is also expected to grow slightly in Connecticut by more than 360 jobs, a 2% increase. This cluster is also expected to grow slightly across the United States, adding about 46,000 jobs over the next 5-year period, which contributes to a 1% increase.
- Average earnings for the agriculture cluster in 2016 within the seCTer Region are the lowest at $41,233, compared to Connecticut at $52,203, and the United States at $48,755. Average earnings in this cluster are lower than average earnings for all sectors.
- The two most prominent occupation groups in the industry include Farmworkers and Laborers, Crop, Nursery and Greenhouse, as well as Farmers, Ranchers, and Other Agricultural Managers, employing 558 and 508 people, respectively, in 2016.

Findings from Focus Groups

Challenges

- Overall agriculture in Connecticut is shrinking, and large-scale agriculture has largely left the state.
- Factory farms have largely replaced small operations.
- Coast Guard regulations tightened and have impacted fishing operations.
- Difficult to site aquaculture facilities/areas
- Farmers markets are unsuccessful without a critical mass of farmers. Many of the farmer's markets in the region are more like craft markets.

"[10] Considering that farms do not have the same reporting requirements as other businesses, the number of jobs in the NAICS 11 industry sector is an estimate. The 2007 USDA County Estimates Book shows 1,855 farm workers in New London County and EMSI reports 1,614 in this industry sector for 2007, secondly the 2012 USDA County Estimates Book shows 1,983 farm workers in New London County and EMSI reports 1,495 in this industry sector for 2012. Therefore, after cross referencing this source, we can conclude that the estimates from EMSI are comparable and useful in our comparison among other industry clusters in the region. For more information regarding Agricultural Census data, please visit the following sources:
https://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/Connecticut/st09_2_007_007.pdf
https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Connecticut/st09_2_007_007.pdf

- Organic certification is a time-consuming process and precludes small farmers from entering health food stores that require it.
- Abutting neighbors complain about farms and create issues for farmers, even in right-to-farm jurisdictions.
- "Every farmer for him-/herself" mentality impedes ability to spread farming knowledge to younger farmers.
- A lack of slaughterhouses is a challenge for local meat production
- Lack of a pervasive "local food" mentality region.

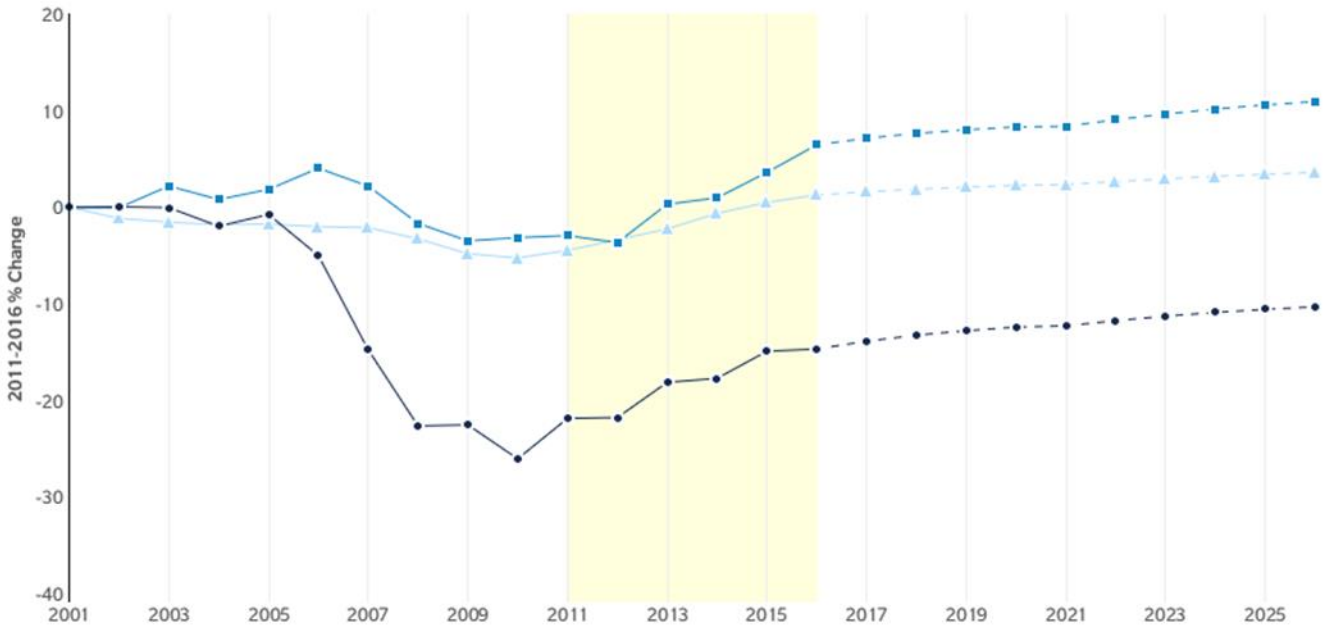
Opportunities

- Education of consumers on the benefits of locally sourced, humanely farmed agriculture is key to driving demand and boosting the industry in the state
- The geographic location of the region is a significant advantage given access to large population centers (NYC, Boston, etc.) within a relatively short distance.
- Larger regional farmers markets are more effective than small ones within each community. The customer base is present; it is the vendors that are lacking.
- Actual farmers need to be engaged alongside advocates.
- Food preservation programs and food hubs are an opportunity to reroute agriculture locally.
- Connecting farmers and restaurants is an opportunity to expand the agriculture market.
- The region can do a better job marketing agriculture assets by creating guides, organizing tours, and undertaking other marketing efforts.
- There are synergies between agriculture and health that should be leveraged. Communities can promote health and agriculture simultaneously.
- Audit and update local ordinances to allow greater agriculture opportunities – create model ordinances and education local officials

What This Means for Regional Economic Growth Strategies

Agriculture, fishing, and food production is a small cluster in the seCTer region with little recent growth. Though small it is important to the region for creating opportunities for local business and entrepreneurs, maintaining and improving land and open space, providing local goods to the region and beyond, and supporting quality of life. Though not a primary cluster to focus on, we recommend including initiatives to strengthen and connect these industries to regional economic growth strategies particularly in terms of local sustainability, connections to food culture, quality of life, visitation, and tourism. Focus should be placed upon supporting small farms and producers to be competitive, technical assistance with communities on land use strategies to support the industries, marketing and education to increase local and regional demand, and tying into regional health initiatives.

Agriculture, Fishing, and Food Production Employment



Region	2011 Jobs	2016 Jobs	Change	% Change	2016 Average Earnings
seCTer Region	1,963	2,144	181	9%	$41,233
Connecticut	18,252	20,019	1,767	10%	$52,203
United States	4,132,264	4,380,389	248,125	6%	$48,755

Figure 11: Agriculture, Fishing, and Food Production Cluster Employment Trends

Table 71: Agriculture, Fishing, and Food Production Cluster, Change in Employment, 2011, 2016, 2021

Past, Present, and Projected Industry Jobs							
Total	2011 Jobs	2016 Jobs	2021 Jobs	2011 - 2016 Change	2011 - 2016 % Change	2016 - 2021 Change	2016 - 2021 % Change
Agriculture, Fishing, and Food Production Cluster	1,963	2,144	2,204	181	9%	60	3%
seCTer Region	148,747	146,184	146,417	(2,563)	(2%)	233	0%
Agriculture, Fishing, and Food Production as Percent of seCTer Region	1%	1%	2%	-	-	-	-
Connecticut	1,797,758	1,868,407	1,906,851	70,649	4%	38,444	2%
U.S.	145,672,482	158,866,954	166,098,861	13,194,472	9%	7,231,907	5%

Source: EMSI

Table 72: Agriculture, Fishing, and Food Production Cluster by 6-digit NAICS Industry

Agriculture, Fishing, and Food Production Cluster Detail									
NAICS (6-digit)	Description	2011 Jobs	2016 Jobs	2011-2016 Change	2011-2016 % Change	2016 Location Quotient	Multiplier	Estimated Employees per Establishment*	GRP
112000	Animal Production and Aquaculture	532	846	314	59%	2.15	1.2370	27	$83,100,854
111000	Crop Production	885	626	(259)	(29%)	0.81	1.1926	32	$32,051,891
311811	Retail Bakeries	104	152	48	46%	1.74	1.1109	15	$3,445,845
312130	Wineries	31	69	38	123%	1.22	1.1887	9	$2,188,007
115115	Farm Labor Contractors and Crew Leaders	81	69	(12)	(15%)	0.23	1.0471	69	$1,386,733
424460	Fish and Seafood Merchant Wholesalers	25	59	34	136%	2.39	1.3072	59	$5,370,047
115210	Support Activities for Animal Production	42	50	8	19%	1.31	1.0974	7	$3,910,417
423820	Farm and Garden Machinery and Equipment Merchant Wholesalers	40	36	(4)	(10%)	0.37	1.4445	12	$5,378,339
424430	Dairy Product (except Dried or Canned) Merchant Wholesalers	24	32	8	33%	0.83	1.3396	32	$4,881,147
424440	Poultry and Poultry Product Merchant Wholesalers	35	30	(5)	(14%)	2.96	1.7279	15	$8,300,675
424450	Confectionery Merchant Wholesalers	<10	23	Insf. Data	Insf. Data	0.44	1.3364	Insf. Data	$2,395,019
114112	Shellfish Fishing	28	21	(7)	(25%)	1.56	1.3370	21	$12,899,673
311812	Commercial Bakeries	31	17	(14)	(45%)	0.14	1.0976	7	$782,130
311520	Ice Cream and Frozen Dessert Manufacturing	<10	17	Insf. Data	Insf. Data	0.92	1.4349	Insf. Data	$1,076,636
113310	Logging	<10	17	Insf. Data	Insf. Data	0.25	1.1602	17	$1,719,402
312120	Breweries	<10	15	Insf. Data	Insf. Data	0.30	1.4364	Insf. Data	$4,203,838
424470	Meat and Meat Product Merchant Wholesalers	13	14	1	8%	0.35	1.2620	14	$1,087,375
424480	Fresh Fruit and Vegetable Merchant Wholesalers	18	13	(5)	(28%)	0.14	1.1303	13	$569,180
333112	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	<10	10	Insf. Data	Insf. Data	0.69	1.2961	Insf. Data	$178,417
	Total	1,963	2,144	181	9%				$174,925,626

*Employees per establishment estimates reflect 2015 establishment data from New London County

Note: Any industry with less than 10 jobs in 2016 is not individually listed in this table, a full list of all industries included in the cluster can be found in Appendix B

Source: EMSI

Table 73: Agriculture, Fishing, and Food Production Cluster, Top 25 Occupations by 5-digit SOC

Top 25 Occupations in Agriculture, Fishing, and Food Production Cluster										
SOC (5-digit)	Description	Employed in Industry Group (2011)	Employed in Industry Group (2016)	Employed in Industry Group (2021)	Change (2011 - 2016)	% Change (2011 - 2016)	Change (2016 - 2021)	% Change (2016 - 2021)	% of Total Jobs in Industry Group (2016)	Median Hourly Earnings (2016)
45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	626	558	523	(68)	(11%)	(35)	(6%)	26%	$11.31
11-9013	Farmers, Ranchers, and Other Agricultural Managers	359	508	602	149	42%	94	19%	24%	$19.74
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	82	83	85	1	1%	2	2%	4%	$16.81
45-2091	Agricultural Equipment Operators	58	55	55	(3)	(5%)	0	0%	3%	$25.24
53-3032	Heavy and Tractor-Trailer Truck Drivers	39	45	44	6	15%	(1)	(2%)	2%	$21.20
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	34	41	41	7	21%	0	0%	2%	$27.22
51-3011	Bakers	33	35	36	2	6%	1	3%	2%	$11.70
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers	40	35	33	(5)	(13%)	(2)	(6%)	2%	$20.78
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	27	33	32	6	22%	(1)	(3%)	2%	$13.83
53-7064	Packers and Packagers, Hand	26	29	28	3	12%	(1)	(3%)	1%	$12.30
53-3033	Light Truck or Delivery Services Drivers	22	26	25	4	18%	(1)	(4%)	1%	$15.15
45-3011	Fishers and Related Fishing Workers	27	23	18	(4)	(15%)	(5)	(22%)	1%	$20.47
51-9111	Packaging and Filling Machine Operators and Tenders	13	20	22	7	54%	2	10%	1%	$14.57
53-3031	Driver/Sales Workers	17	20	20	3	18%	0	0%	1%	$12.26
11-1021	General and Operations Managers	14	19	19	5	36%	0	0%	1%	$50.21
45-2041	Graders and Sorters, Agricultural Products	25	18	15	(7)	(28%)	(3)	(17%)	1%	$18.22
43-5081	Stock Clerks and Order Fillers	13	18	17	5	38%	(1)	(6%)	1%	$11.15
43-3031	Bookkeeping, Accounting, and Auditing Clerks	17	17	17	0	0%	0	0%	1%	$18.73
43-9061	Office Clerks, General	14	16	16	2	14%	0	0%	1%	$15.69
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	14	16	16	2	14%	0	0%	1%	$17.88
39-2021	Nonfarm Animal Caretakers	18	15	18	(3)	(17%)	3	20%	1%	$10.12
41-2031	Retail Salespersons	<10	15	16	6	67%	1	7%	1%	$10.83
51-3092	Food Batchmakers	10	15	16	5	50%	1	7%	1%	$12.06
37-3011	Landscaping and Groundskeeping Workers	16	14	14	(2)	(13%)	0	0%	1%	$12.55
49-9071	Maintenance and Repair Workers, General	12	14	15	2	17%	1	7%	1%	$19.00

Source: EMSI

Creative Cluster

The Creative cluster was defined to include 39 NAICS codes identified by the The Creative Economy Coalition as commonly included in definitions of the creative economy.[11]

Key Findings

- This cluster makes up only about 1% of the seCTer region economy with 1,928 jobs in 2016 and contributes less than 1% or $112,972,887, to the entire seCTer region GRP.
- The two largest 6-digit NAICS industry within the cluster are Museums and Newspaper Publishers, with 393 and 333 jobs, respectively, together making up nearly 38% of jobs in 2016. These industries contribute $39,190,157 to seCTer GRP.
- The Creative cluster within the seCTer region has shown decline over the past 5 years by 175 jobs, an 8% decrease, and is projected to continue to decline by another 201 jobs in the upcoming 5-year period which would contribute to another 10% decrease. Similarly, this cluster has shown decline in Connecticut by more than 380 jobs, a marginal 1% increase, over the past 5-year period. Conversely, this cluster grew 5% across the United States, adding over 154,000 new jobs over the past 5-year period.
- Graphic designers, teachers, advertising sales agents, photographers, and musicians make up the top five occupations within Creative sectors in the region.
- Average earnings for 2016 in the seCTer Region being about $38,000 are substantially lower than that of Connecticut, and the United States being over $67,00 and $65,000, respectively. Average earnings for Creative sectors combined within the SeCTER region are also lower than the average for all industries.

Findings from Focus Groups

Challenges

- Finding and retaining skilled labor is a challenge across industries.
- There is little in the region that attracts/retains younger workers, such as place-based amenities, networks, housing and transportation options
- Quality of life is limited for Millennials due to lack of critical mass of young people, lack of interesting things to do, poor access to affordable housing, and few continuing education opportunities.
- Not a well-defined, dense cluster in the region. Region not known creative talent brand as a place for creative talent
- Employers must create their own culture to retain talent since the region as a whole lacks it.

Opportunities

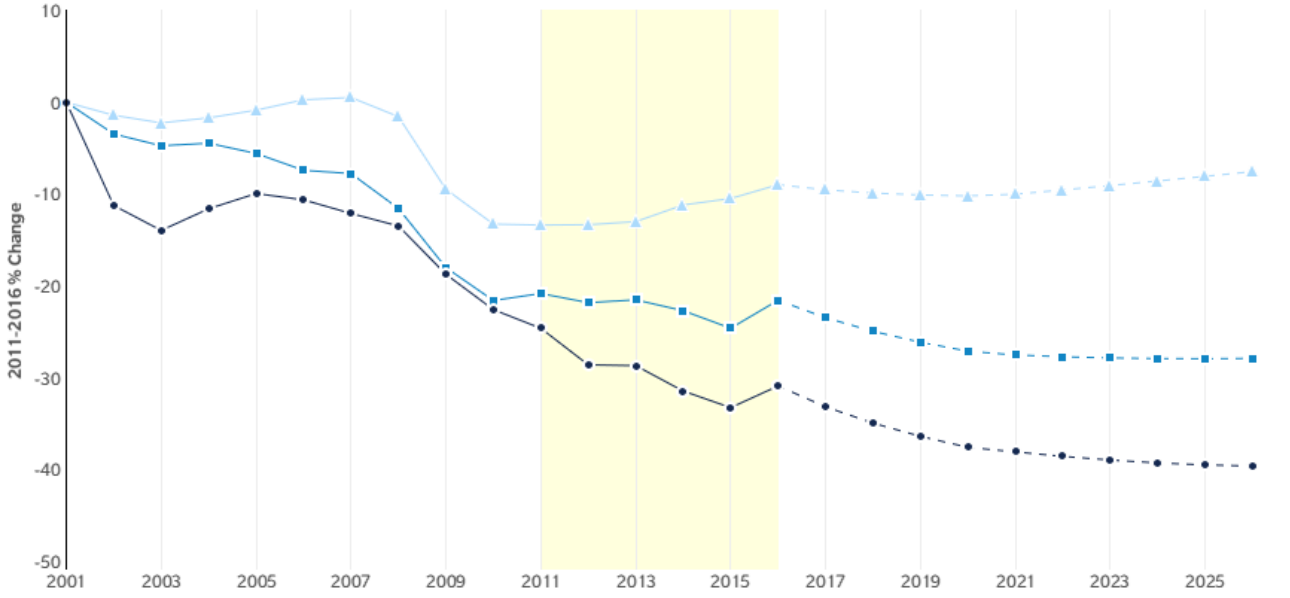
- Commitment to quality of place amenities and related investment in paces (infrastructure, housing, transportation)
- Marketing to change the perception of the area is an opportunity to attract Millennials.

[11] The Creative Economy Coalition produced a report entitled "America's Creative Economy," a meta-analysis of numerous documents analyzing the creative economy in various regions and states across the U.S. In the report, 39 NAICS codes are identified as having been included in the definition of the creative economy in at least 75% of these documents. These NAICS codes are used to define the seCTer's regions Creative cluster.

What This Means for Regional Economic Growth Strategies

The group of industries that make up the Creative cluster represent a relatively small portion of employment within the seCTer region. As a whole, this group has also experienced recent decline, while both the state and nation have experienced increases. Outside of a concentration of STEM-related occupations which exist primarily for the larger industries, namely defense, advanced manufacturing, and pharmaceuticals, the region lacks an identity as a creative economy region. We therefore do not recommend this as a primary industry focus area for the CEDS. However, many of the same needs exist within these creative industries to support future growth including quality of place amenities and infrastructure and stronger networks to attract and retain talent. Furthermore, there are opportunities for these industries to overlap with key sectors in the region including tourism, food and agriculture, and the STEM-intensive industries. It is therefore important that the region continue to assess opportunities and efforts to build capacity to support these creative industries and related occupations.

Creative Employment



Region	2011 Jobs	2016 Jobs	Change	% Change	2016 Average Earnings
seCTer Region	2,103	1,928	-175	-8%	$38,077
Connecticut	41,044	40,662	-382	-1%	$67,762
United States	3,048,810	3,203,582	154,772	5%	$65,372

Figure 12: Creative Cluster Employment Trends

Table 74: Creative Cluster, Change in Employment, 2011, 2016, 2021

Past, Present, and Projected Industry Jobs							
Total	2011 Jobs	2016 Jobs	2021 Jobs	2011 - 2016 Change	2011 - 2016 % Change	2016 - 2021 Change	2016 - 2021 % Change
Creative Cluster	2,103	1,928	1,727	(175)	(8%)	(201)	(10%)
seCTer Region	148,747	146,184	146,417	(2,563)	(2%)	233	0%
Creative as Percent of seCTer Region	1%	1%	1%	-	-	-	-
Connecticut	1,797,758	1,868,407	1,906,851	70,649	4%	38,444	2%
U.S.	145,672,482	158,866,954	166,098,861	13,194,472	9%	7,231,907	5%

Source: EMSI

Table 75: Creative Cluster by 6-digit NAICS Industry

Creative Cluster Detail									
NAICS (6-digit)	Description	2011 Jobs	2016 Jobs	2011-2016 Change	2011-2016 % Change	2016 Location Quotient	Multiplier	Estimated Employees per Establishment*	GRP
712110	Museums	348	393	45	13%	4.62	1.2288	45	$14,739,157
511110	Newspaper Publishers	417	333	(84)	(20%)	1.87	1.2152	58	$24,451,000
515112	Radio Stations	162	163	1	1%	2.36	1.2976	41	$10,971,319
611610	Fine Arts Schools	115	151	36	31%	1.23	1.0536	11	$3,131,268
711510	Independent Artists, Writers, and Performers	150	138	(12)	(8%)	0.51	1.0473	19	$6,901,779
519120	Libraries and Archives	93	80	(13)	(14%)	2.98	1.0654	12	$2,486,696
541430	Graphic Design Services	77	75	(2)	(3%)	0.60	1.1105	7	$4,067,685
541921	Photography Studios, Portrait	68	72	4	6%	1.36	1.1141	8	$4,955,277
323111	Commercial Printing (except Screen and Books)	166	71	(95)	(57%)	0.23	1.2061	7	$7,249,078
711130	Musical Groups and Artists	50	64	14	28%	1.39	1.4365	13	$3,652,302
541410	Interior Design Services	63	52	(11)	(17%)	0.59	1.0504	13	$1,433,093
711110	Theater Companies and Dinner Theaters	43	51	8	19%	0.74	1.2332	8	$2,665,360
512110	Motion Picture and Video Production	65	43	(22)	(34%)	0.16	1.4803	6	$8,658,114
711190	Other Performing Arts Companies	38	37	(1)	(3%)	4.57	1.2031	37	$838,209
541320	Landscape Architectural Services	32	34	2	6%	0.75	1.2180	7	$2,861,466
511120	Periodical Publishers	29	23	(6)	(21%)	0.22	1.2165	5	$1,577,220
541310	Architectural Services	30	22	(8)	(27%)	0.12	1.2351	6	$1,791,106
541810	Advertising Agencies	14	18	4	29%	0.09	1.2054	4	$1,550,010
711410	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures	<10	16	Insf. Data	Insf. Data	0.50	1.2490	16	$1,340,676
453920	Art Dealers	18	16	(2)	(11%)	0.73	1.1228	4	$2,368,136
511130	Book Publishers	35	14	(21)	(60%)	0.21	1.4079	10	$3,494,223
541420	Industrial Design Services	<10	13	Insf. Data	Insf. Data	0.57	1.1222	7	$731,358
515120	Television Broadcasting	23	10	(13)	(57%)	0.08	1.2146	5	$1,058,354
	Total	2,103	1,928	(175)	(8%)				$112,972,887

*Employees per establishment estimates reflect 2015 establishment data from New London County

Note: Any industry with less than 10 jobs in 2016 is not individually listed in this table, a full list of all industries included in the cluster can be found in Appendix B

Source: EMSI

Table 76: Creative Cluster, Top 25 Occupations by 5-digit SOC

Top 25 Occupations in Creative Cluster										
SOC (5-digit)	Description	Employed in Industry Group (2011)	Employed in Industry Group (2016)	Employed in Industry Group (2021)	Change (2011 - 2016)	% Change (2011 - 2016)	Change (2016 - 2021)	% Change (2016 - 2021)	% of Total Jobs in Industry Group (2016)	Median Hourly Earnings (2016)
27-1024	Graphic Designers	87	73	64	(14)	(16%)	(9)	(12%)	4%	$19.47
25-3021	Self-Enrichment Education Teachers	56	70	80	14	25%	10	14%	4%	$18.70
41-3011	Advertising Sales Agents	79	68	58	(11)	(14%)	(10)	(15%)	4%	$20.56
27-2042	Musicians and Singers	61	57	53	(4)	(7%)	(4)	(7%)	3%	$20.96
27-4021	Photographers	57	53	50	(4)	(7%)	(3)	(6%)	3%	$15.80
11-1021	General and Operations Managers	52	50	45	(2)	(4%)	(5)	(10%)	3%	$50.21
27-3011	Radio and Television Announcers	50	48	43	(2)	(4%)	(5)	(10%)	2%	$12.35
27-3041	Editors	58	47	36	(11)	(19%)	(11)	(23%)	2%	$22.68
43-9061	Office Clerks, General	46	44	39	(2)	(4%)	(5)	(11%)	2%	$15.69
27-3043	Writers and Authors	53	43	36	(10)	(19%)	(7)	(16%)	2%	$18.76
27-2012	Producers and Directors	45	41	39	(4)	(9%)	(2)	(5%)	2%	$26.37
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	38	39	36	1	3%	(3)	(8%)	2%	$17.88
27-1025	Interior Designers	42	38	36	(4)	(10%)	(2)	(5%)	2%	$18.23
51-5112	Printing Press Operators	62	36	21	(26)	(42%)	(15)	(42%)	2%	$15.64
43-4051	Customer Service Representatives	38	32	26	(6)	(16%)	(6)	(19%)	2%	$16.33
11-9199	Managers, All Other	38	32	28	(6)	(16%)	(4)	(13%)	2%	$37.75
27-3022	Reporters and Correspondents	40	30	27	(10)	(25%)	(3)	(10%)	2%	$15.56
27-2022	Coaches and Scouts	22	28	33	6	27%	5	18%	1%	$18.32
25-3099	Teachers and Instructors, All Other	22	27	32	5	23%	5	19%	1%	$22.86
25-4013	Museum Technicians and Conservators	22	24	23	2	9%	(1)	(4%)	1%	$24.37
33-9032	Security Guards	19	22	21	3	16%	(1)	(5%)	1%	$12.08
43-1011	First-Line Supervisors of Office and	23	22	18	(1)	(4%)	(4)	(18%)	1%	$25.66
39-2021	Nonfarm Animal Caretakers	19	21	20	2	11%	(1)	(5%)	1%	$10.12
43-3031	Bookkeeping, Accounting, and Auditing Clerks	24	21	17	(3)	(13%)	(4)	(19%)	1%	$18.73
41-2011	Cashiers	19	21	20	2	11%	(1)	(5%)	1%	$9.98

Source: EMSI

Advanced Manufacturing Cluster

This cluster includes all manufacturing industries that require advanced technologies or skills but excludes pharmaceutical and medical-related manufacturing, which is included under the examination of the Bioscience cluster, shipbuilding because it is included in the Defense cluster, and boat building which is included in in the Marine cluster.

Key Findings

- This cluster makes up about 1% of the seCTer region economy with 1,917 jobs in 2016 and contributes about 1.6% or $239,246,665 to the entire seCTer region GRP.
- Computer and Electronic Product Manufacturing; Electrical Equipment, Appliance, and Component Manufacturing, and Aerospace Product and Parts Manufacturing industries represent over half of the employment in this cluster.
- The Advanced Manufacturing cluster within the seCTer region has shown decline over the past 5 years, losing 135 jobs, a -7% decrease. Projected increases in the Defense Cluster due to federal contracts should allow this cluster to grow.
- Occupations in the industry include highly skilled machinists, assemblers, technicians and engineers
- Average earnings for 2016 in the seCTer Region at $79,998 are considerable higher than those within all industry sectors however are lower than Connecticut, and the United States for the same industries being $103,480 and $88,428 respectively.

Findings from Focus Groups

Challenges

- Lack of public transportation in certain parts of the region is a challenge for employers needing to access labor pools
- Housing and jobs within the region are isolated; better mix of uses is needed
- Making a career in manufacturing appealing to the younger generation (and their parents and guidance counselors) is a significant challenge, making it difficult to attract and retain workers.
- There is a shortage of skilled fabricators who want to work for a small company, in part because it is difficult for small companies to match the employee benefits of larger companies.
- Natural gas infrastructure is needed in certain parts of the region. Natural gas is in demand by energy-intensive companies because it is relatively inexpensive.
- Limited broadband options are available
- Keeping people, especially skilled workers, within Connecticut in increasingly becoming an issue.
- Access to capital for business renovation and/or expansion is an issue, as local businesses have had trouble securing loans from commercial banks.

Opportunities

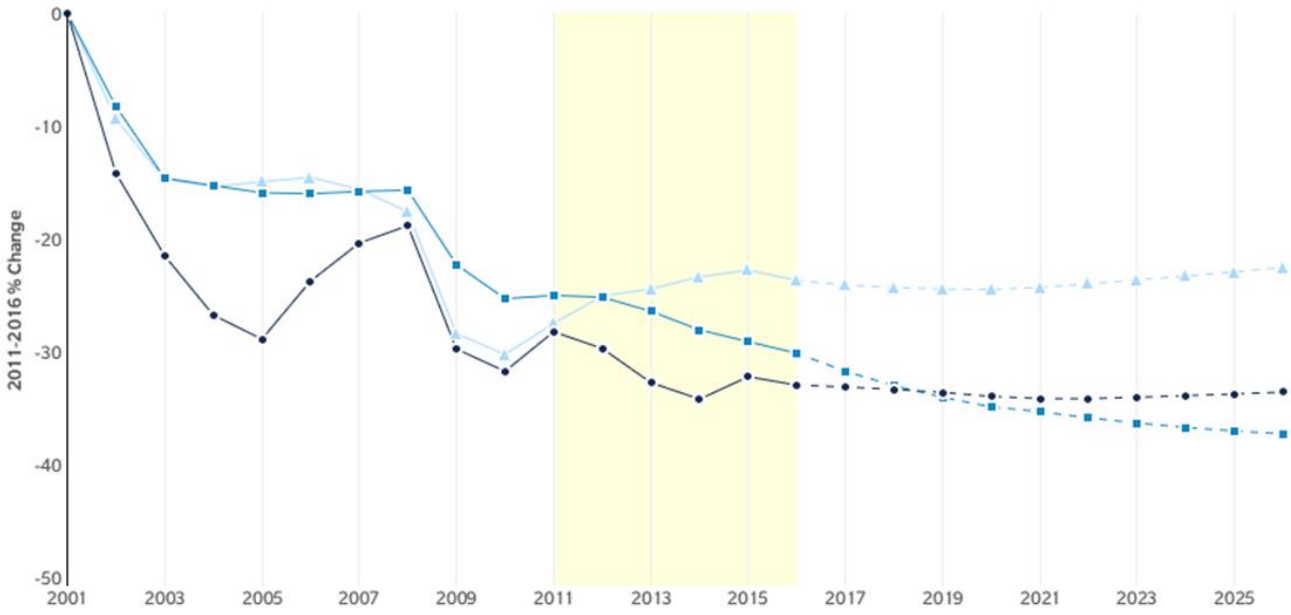
- Manufacturing training programs are largely in place through the Eastern Advanced Manufacturing Alliance (EAMA) and through solid reputation and performance of the Eastern CT Workforce Investment Board
- A mentor program to guide students through the process of becoming a manufacturing worker could help.

- Opportunity to change the narrative about Southeastern Connecticut and tout the benefits of being in the region.

What This Means for Regional Economic Growth Strategies

Because of its connection to the defense industry as well as supporting high-skill, high-wage jobs this is an important cluster for the seCTer region and should continue as a primary focus area. Efforts should focus on supporting EAMA and the Eastern Connecticut WIB in workforce development initiatives well as improving transportation, energy, broadband, and housing options in the region.

Advanced Manufacturing Employment



Region	2011 Jobs	2016 Jobs	Change	% Change	2016 Average Earnings
seCTer Region	2,052	1,917	-135	-7%	$79,998
Connecticut	101,828	94,870	-6,958	-7%	$103,480
United States	5,341,346	5,620,737	279,391	5%	$88,428

Figure 13: Advanced Manufacturing Cluster Employment Trends

Table 77: Advanced Manufacturing Cluster, Change in Employment, 2011, 2016, 2021

Past, Present, and Projected Industry Jobs							
Total	2011 Jobs	2016 Jobs	2021 Jobs	2011 - 2016 Change	2011 - 2016 % Change	2016 - 2021 Change	2016 - 2021 % Change
Advanced Manufacturing Cluster	2,052	1,917	1,883	(135)	(7%)	(34)	(2%)
seCTer Region	148,747	146,184	146,417	(2,563)	(2%)	233	0%
Advanced Manufacturing as Percent of seCTer Region	1%	1%	1%	-	-	-	-
Connecticut	1,797,758	1,868,407	1,906,851	70,649	4%	38,444	2%
U.S.	145,672,482	158,866,954	166,098,861	13,194,472	9%	7,231,907	5%

Source: EMSI

Table 78: Advanced Manufacturing Cluster by 6-digit NAICS Industry

Advanced Manufacturing Cluster Detail									
NAICS (6-digit)	Description	2011 Jobs	2016 Jobs	2011-2016 Change	2011-2016 % Change	2016 Location Quotient	Multiplier	Estimated Employees per Establishment*	GRP
333519	Rolling Mill and Other Metalworking Machinery Manufacturing	291	339	48	16%	30.82	1.3479	339	$42,463,182
335929	Other Communication and Energy Wire Manufacturing	231	230	(1)	(0%)	18.49	1.3468	57	$31,442,682
334514	Totalizing Fluid Meter and Counting Device Manufacturing	136	171	35	26%	18.21	1.2639	171	$23,713,223
336412	Aircraft Engine and Engine Parts Manufacturing	107	114	7	7%	1.60	1.6984	114	$20,728,055
335921	Fiber Optic Cable Manufacturing	84	114	30	36%	12.47	1.3302	Insf. Data	$15,481,268
332322	Sheet Metal Work Manufacturing	102	112	10	10%	1.16	1.2069	14	$7,691,582
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	101	101	0	0%	1.02	1.5897	52	$21,147,813
335931	Current-Carrying Wiring Device Manufacturing	64	79	15	23%	2.59	1.2440	41	$4,688,691
334416	Capacitor, Resistor, Coil, Transformer, and Other Inductor Manufacturing	54	69	15	28%	4.38	1.1489	69	$5,458,053
333244	Printing Machinery and Equipment Manufacturing	84	64	(20)	(24%)	10.03	1.3112	36	$7,433,734
332710	Machine Shops	56	62	6	11%	0.23	1.1784	3	$5,969,947
335313	Switchgear and Switchboard Apparatus Manufacturing	47	60	13	28%	1.84	1.2412	25	$7,647,704
332618	Other Fabricated Wire Product Manufacturing	36	53	17	47%	2.34	1.2735	53	$4,201,534
334210	Telephone Apparatus Manufacturing	75	46	(29)	(39%)	2.91	1.5665	46	$16,733,781
332313	Plate Work Manufacturing	41	39	(2)	(5%)	0.90	1.1785	39	$1,432,289
423820	Farm and Garden Machinery and Equipment Merchant Wholesalers	40	36	(4)	(10%)	0.37	1.4445	12	$5,378,339
332312	Fabricated Structural Metal Manufacturing	34	35	1	3%	0.42	1.3587	19	$4,762,539
333132	Oil and Gas Field Machinery and Equipment Manufacturing	23	22	(1)	(4%)	0.41	1.2690	Insf. Data	$2,026,316
334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables	14	22	8	57%	0.37	1.1847	22	$723,193
334613	Blank Magnetic and Optical Recording Media Manufacturing	13	21	8	62%	5.30	1.1694	Insf. Data	$1,488,779
333999	All Other Miscellaneous General Purpose Machinery Manufacturing	<10	20	Insf. Data	Insf. Data	0.54	1.3772	20	$1,298,893
336310	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	10	16	6	60%	0.27	1.4721	5	$2,337,707
334419	Other Electronic Component Manufacturing	<10	13	Insf. Data	Insf. Data	0.22	1.2229	Insf. Data	$676,181
335122	Commercial, Industrial, and Institutional Electric Lighting Fixture Manufacturing	<10	13	Insf. Data	Insf. Data	0.63	1.1603	13	$1,908,645
335991	Carbon and Graphite Product Manufacturing	16	10	(6)	(38%)	1.43	1.2132	10	$2,412,536
	Total	2,052	1,917	(135)	(7%)				$239,246,665

*Employees per establishment estimates reflect 2015 establishment data from New London County

Note: Any industry with less than 10 jobs in 2016 is not individually listed in this table, a full list of all industries included in the cluster can be found in Appendix B
Source: EMSI

Table 79: Advanced Manufacturing Cluster, Top 25 Occupations by 5-digit SOC

Top 25 Occupations in Advanced Manufacturing Cluster										
SOC (5-digit)	Description	Employed in Industry Group (2011)	Employed in Industry Group (2016)	Employed in Industry Group (2021)	Change (2011 - 2016)	% Change (2011 - 2016)	Change (2016 - 2021)	% Change (2016 - 2021)	% of Total Jobs in Industry Group (2016)	Median Hourly Earnings (2016)
51-4041	Machinists	108	112	111	4	4%	(1)	(1%)	6%	$21.65
51-2022	Electrical and Electronic Equipment Assemblers	108	97	101	(11)	(10%)	4	4%	5%	$14.60
51-2092	Team Assemblers	105	88	88	(17)	(16%)	0	0%	5%	$13.84
51-1011	First-Line Supervisors of Production and Operating Workers	73	69	67	(4)	(5%)	(2)	(3%)	4%	$29.01
17-2141	Mechanical Engineers	68	65	64	(3)	(4%)	(1)	(2%)	3%	$38.98
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	62	59	60	(3)	(5%)	1	2%	3%	$20.51
11-1021	General and Operations Managers	61	58	54	(3)	(5%)	(4)	(7%)	3%	$50.21
51-4111	Tool and Die Makers	48	49	44	1	2%	(5)	(10%)	3%	$28.55
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	47	45	41	(2)	(4%)	(4)	(9%)	2%	$16.51
17-2112	Industrial Engineers	44	43	45	(1)	(2%)	2	5%	2%	$40.07
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	41	43	47	2	5%	4	9%	2%	$20.56
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	38	34	32	(4)	(11%)	(2)	(6%)	2%	$27.22
43-5071	Shipping, Receiving, and Traffic Clerks	31	28	26	(3)	(10%)	(2)	(7%)	1%	$15.62
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	31	27	22	(4)	(13%)	(5)	(19%)	1%	$15.21
43-9061	Office Clerks, General	29	27	25	(2)	(7%)	(2)	(7%)	1%	$15.69
11-9041	Architectural and Engineering Managers	28	27	26	(1)	(4%)	(1)	(4%)	1%	$62.44
13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	28	26	26	(2)	(7%)	0	0%	1%	$28.59
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	29	26	27	(3)	(10%)	1	4%	1%	$13.83
51-4121	Welders, Cutters, Solderers, and Brazers	30	25	25	(5)	(17%)	0	0%	1%	$19.92
11-3051	Industrial Production Managers	27	25	24	(2)	(7%)	(1)	(4%)	1%	$49.03
51-2023	Electromechanical Equipment Assemblers	27	25	24	(2)	(7%)	(1)	(4%)	1%	$16.73
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	29	24	23	(5)	(17%)	(1)	(4%)	1%	$18.27
17-2071	Electrical Engineers	25	23	23	(2)	(8%)	0	0%	1%	$40.66
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	24	22	21	(2)	(8%)	(1)	(5%)	1%	$17.88
17-3023	Electrical and Electronics Engineering Technicians	22	22	22	0	0%	0	0%	1%	$27.59

Source: EMSI

Maritime Cluster

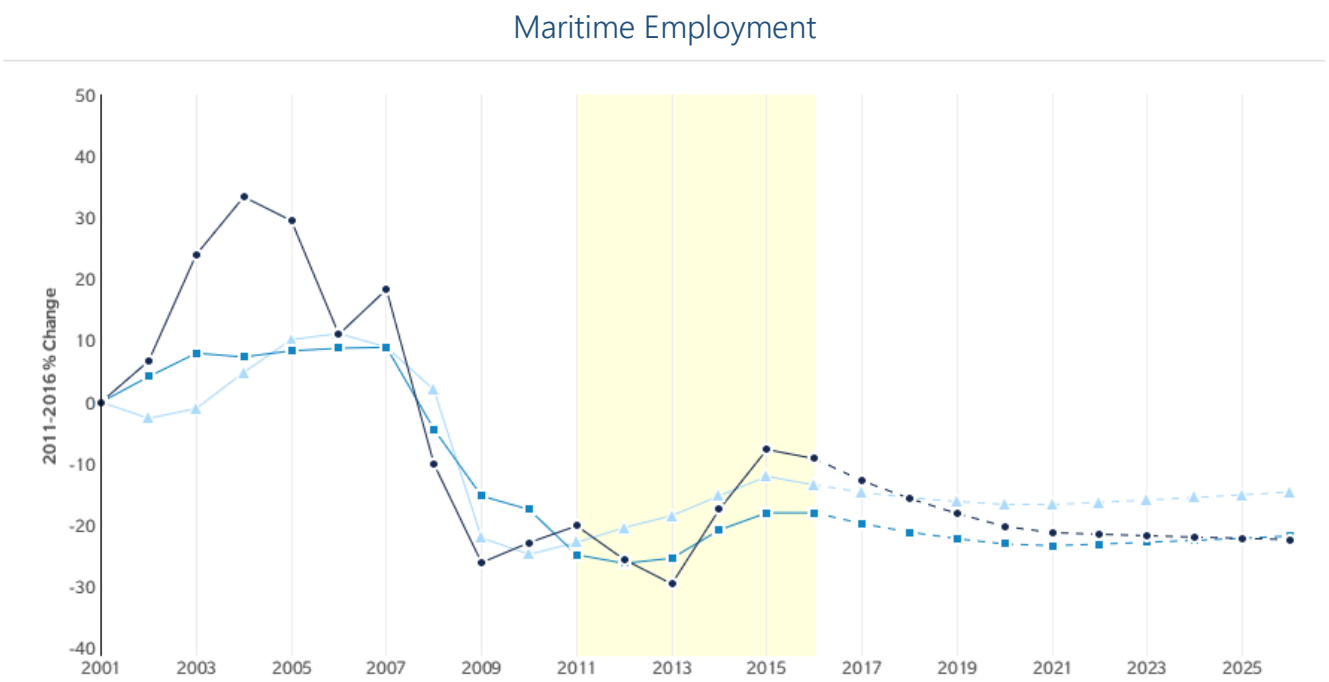
This cluster is incudes industries related to Boat Building (excluding Defense Ship Building), Boat Dealers, Marine Transportation, Scenic and Sightseeing Transportation, and Marine Cargo Handling.

Key Findings

- This cluster makes up less than 1% of the seCTer region economy with 422 jobs in 2016, and contributes less than 1% or $48,172,442, to the seCTer region GRP.
- The largest 6-digit NAICS industry within the cluster is Coastal and Great Lakes Passenger Transportation, with 165, or 39% of jobs in 2016. This industry specifically contributes $34,631,868 to seCTer GRP. Boat Dealers is the second largest industry employment 109 workers in 2016.
- The Maritime cluster within the seCTer region has shown growth over the past 5 years by about 51 jobs, a 14% increase, which exceeds the growth for this group of industries in Connecticut and the US.
- The most prominent occupation within this cluster is Captains, Mates, and Pilots of Water Vessels, employing 65 people in 2016 and having median hourly earnings of about $36.50.
- Average earnings for 2016, only within the seCTer Region are highest at $73,403, whereas earnings in Connecticut are $61,243 and $59,373 in the United States.

What This Means for Regional Economic Growth Strategies

This is a very small cluster, but it has higher than average wages and is important to the tourism-related economy given the region's coastal location. It should therefore be considered together with the Tourism cluster as a primary focus area for regional growth and also considered in relation to marine related manufacturing and food production.



Region	2011 Jobs	2016 Jobs	Change	% Change	2016 Average Earnings
seCTer Region	371	422	51	14%	$73,403
Connecticut	1,109	1,210	101	9%	$61,243
United States	128,263	143,817	15,554	12%	$59,373

Figure 14: Maritime Cluster Employment Trends

Table 80: Maritime Cluster, Change in Employment, 2011, 2016, 2021

Past, Present, and Projected Industry Jobs							
Total	2011 Jobs	2016 Jobs	2021 Jobs	2011 - 2016 Change	2011 - 2016 % Change	2016 - 2021 Change	2016 - 2021 % Change
Maritime Cluster	371	422	366	51	14%	(56)	(13%)
seCTer Region	148,747	146,184	146,417	(2,563)	(2%)	233	0%
Maritime as Percent of seCTer Region	0%	0%	0%	-	-	-	-
Connecticut	1,797,758	1,868,407	1,906,851	70,649	4%	38,444	2%
U.S.	145,672,482	158,866,954	166,098,861	13,194,472	9%	7,231,907	5%

Source: EMSI

Table 81: Maritime Cluster by 6-digit NAICS Industry

Maritime Cluster Detail									
NAICS (6-digit)	Description	2011 Jobs	2016 Jobs	2011-2016 Change	2011-2016 % Change	2016 Location Quotient	Multiplier	Estimated Employees per Establishment*	GRP
336612	Boat Building	22	79	57	259%	2.43	1.3756	40	$3,615,661
441222	Boat Dealers	91	109	18	20%	3.32	1.1915	10	$7,433,960
483114	Coastal and Great Lakes Passenger Transportation	194	165	(29)	(15%)	25.39	2.0366	165	$34,631,868
487210	Scenic and Sightseeing Transportation, Water	36	41	5	14%	2.84	1.1505	5	$992,871
488320	Marine Cargo Handling	28	28	0	0%	0.61	1.5540	28	$1,498,082
	Total	371	422	51	14%				$48,172,442

*Employees per establishment estimates reflect 2015 establishment data from New London County

Note: Any industry with less than 10 jobs in 2016 is not individually listed in this table, a full list of all industries included in the cluster can be found in Appendix B

Source: EMSI

Table 82: Maritime Cluster, Top 25 Occupations by 5-digit SOC

Top 5 Occupations in Maritime Cluster										
SOC (5-digit)	Description	Employed in Industry Group (2011)	Employed in Industry Group (2016)	Employed in Industry Group (2021)	Change (2011 - 2016)	% Change (2011 - 2016)	Change (2016 - 2021)	% Change (2016 - 2021)	% of Total Jobs in Industry Group (2016)	Median Hourly Earnings (2016)
53-5021	Captains, Mates, and Pilots of Water Vessels	71	65	57	(6)	(8%)	(8)	(12%)	15%	$36.49
41-2031	Retail Salespersons	20	25	23	5	25%	(2)	(8%)	6%	$10.83
11-1021	General and Operations Managers	16	16	14	0	0%	(2)	(13%)	4%	$50.21
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	13	14	11	1	8%	(3)	(21%)	3%	$13.83
49-3051	Motorboat Mechanics and Service Technicians	11	13	11	2	18%	(2)	(15%)	3%	$22.95

Note: All other occupations had <10 people employed

Source: EMSI

Appendix A: Data Sources

The following proprietary and public sources were used to collect data for this report:

Economic Modeling Specialists International (EMSI)

To analyze the industrial makeup of a study area, industry data organized by the North American Industrial Classification System (NAICS) is assessed. Camoin Associates subscribes to Economic Modeling Specialists Intl. (EMSI), a proprietary data provider that aggregates economic data from approximately 90 sources. EMSI industry data, in our experience, is more complete than most or perhaps all local data sources (for more information on EMSI, please see www.economicmodeling.com). This is because local data sources typically miss significant employment counts by industry because data on sole proprietorships and contractual employment (i.e. 1099 contractor positions) is not included and because certain employment counts are suppressed from BLS/BEA figures for confidentiality reasons when too few establishments exist within a single NAICS code.

Esri Business Analyst Online (BAO)

ESRI is the leading provider of location-driven market insights. It combines demographic, lifestyle, and spending data with map-based analytics to provide market intelligence for strategic decision-making. ESRI uses proprietary statistical models and data from the U.S. Census Bureau, the U.S. Postal Service, and various other sources to present current conditions and project future trends. Esri data are used by developers to maximize their portfolio, retailers to understand growth opportunities, and by economic developers to attract business that fit their community. For more information, visit www.esri.com.

American Community Survey (ACS), U.S. Census

The American Community Survey (ACS) is an ongoing statistical survey by the U.S. Census Bureau that gathers demographic and socioeconomic information on age, sex, race, family and relationships, income and benefits, health insurance, education, veteran status, disabilities, commute patterns, and other topics. The survey is mandatory to fill out, but the survey is only sent to a small sample of the population on a rotating basis. The survey is crucial to major planning decisions, like vital services and infrastructure investments, made by municipalities and cities. The questions on the ACS are different than those asked on the decennial census and provide ongoing demographic updates of the nation down to the block group level. For more information on the ACS, visit http://www.census.gov/programs-surveys/acs/

Local Area Unemployment Statistics (LAUS), U.S. Bureau of Labor Statistics (BLS)

The Local Area Unemployment Statistics (LAUS) program estimates total employment and unemployment for approximately 7,500 geographic areas on a monthly basis, from the national level down to the city and town level. LAUS data is developed through U.S. Bureau of Labor Statistics (BLS) by combining data from the Current Population Survey (CPS), Current Employment Statistics (CES) survey, and state unemployment (UI) systems. More information on LAUS can be found here: http://www.bls.gov/lau/lauov.htm

OnTheMap, U.S. Census

OnTheMap is a tool developed through the U.S. Census Longitudinal Employer-Household Dynamics (LEHD) program that helps to visualize Local Employment Dynamics (LED) data about where workers are employed and where they live. There are also visual mapping capabilities for data on age, earnings, industry distributions, race, ethnicity, educational attainment, and sex. The OnTheMap tool can be found here, along with links to documentation: http://onthemap.ces.census.gov/

Census Flows Mapper, U.S. Census

The Census Flows Mapper is a web mapping application that provides users with an interface to view county-to-county migration flow maps of the United States, as well as download the underlying data. The tool shows migration

inflows, outflows, and net flows and can be cross-tabulated by demographic characteristics such as place of birth, English-speaking ability, and number of years in the U.S. It utilizes American Community Survey (ACS) data.

Business Dynamics Statistics (BDS), U.S. Census Center for Economic Studies

The Business Dynamics Statistics (BDS) program provides annual measures of business dynamics (such as job creation and destruction, establishment births and deaths, and firm startups and shutdowns) for the economy and aggregated by establishment and firm characteristics. It covers the entire U.S. economy and is available at the national, state, and MSA levels.

PwC MoneyTree™ Report, PricewaterhouseCoopers

The PricewaterhouseCoopers MoneyTree™ Report, based on data from Thomson Reuters, provides information on emerging companies that receive financing and the venture capital firms that provide it. The report is updated quarterly and provides investment data by region, industry, stage of development, and financing sequence. More at https://www.pwcmoneytree.com/

Other Sources

Regional data for municipality grant list values, bond ratings, and mill rates, have been collected from the State of Connecticut Office of Policy Management. For more information, visit www.ct.gov. The Connecticut Department of Labor data was also used for labor force information, for more information, visit www.ctdol.state.ct.us/.

The Small Business Innovation Research (SBIR) program was used to find venture capital and research and development data in the region. For more information visit www.sbir.gov/.

Appendix B: EMSI Region Definition

The map below shows the delineation of the seCTer region for data sourced from EMSI, and for which the "seCTer Region" is specified as the geography. This region was approximated using ZIP codes, as this is the only sub-county geographic unit for which EMSI provides data. The black boundaries show the ZIP codes that were used to approximate the seCTer region in EMSI. The blue shaded area is the official extent of the seCTer region. Note that while the ZIP code definition does not align exactly with the official definition, it is a very close approximation, and it does not exclude any of the seCTer territory.

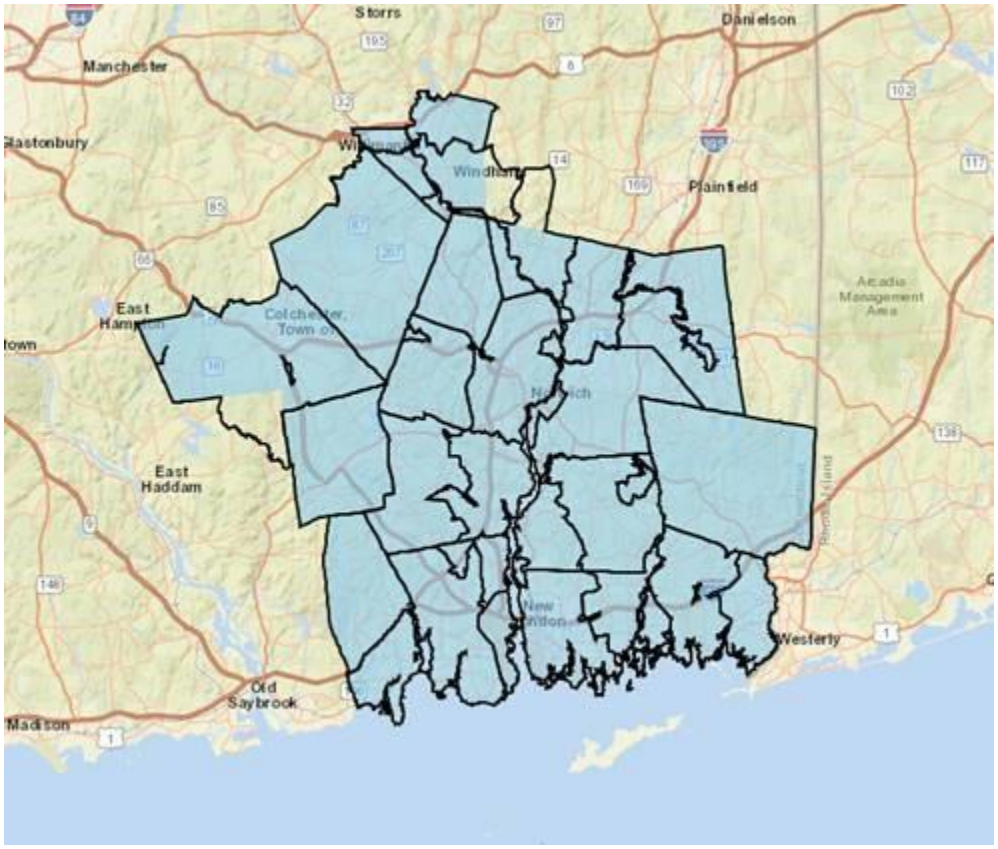


Figure 15: seCTer Region Definition for EMSI Data

Appendix C: Cluster Definitions

Tourism Cluster	
NAICS (6-digit)	Description
441210	Recreational Vehicle Dealers
441228	Motorcycle, ATV, and All Other Motor Vehicle Dealers
442110	Furniture Stores
442299	All Other Home Furnishings Stores
443141	Household Appliance Stores
443142	Electronics Stores
444130	Hardware Stores
445110	Supermarkets and Other Grocery (except Convenience) Stores
445120	Convenience Stores
445210	Meat Markets
445220	Fish and Seafood Markets
445230	Fruit and Vegetable Markets
445291	Baked Goods Stores
445292	Confectionery and Nut Stores
445299	All Other Specialty Food Stores
445310	Beer, Wine, and Liquor Stores
446110	Pharmacies and Drug Stores
446120	Cosmetics, Beauty Supplies, and Perfume Stores
446191	Food (Health) Supplement Stores
446199	All Other Health and Personal Care Stores
447110	Gasoline Stations with Convenience Stores
447190	Other Gasoline Stations
448110	Men's Clothing Stores
448120	Women's Clothing Stores
448130	Children's and Infants' Clothing Stores
448140	Family Clothing Stores
448150	Clothing Accessories Stores
448190	Other Clothing Stores
448210	Shoe Stores
448310	Jewelry Stores
448320	Luggage and Leather Goods Stores
451110	Sporting Goods Stores
451120	Hobby, Toy, and Game Stores
451130	Sewing, Needlework, and Piece Goods Stores
451140	Musical Instrument and Supplies Stores
451211	Book Stores
451212	News Dealers and Newsstands
452111	Department Stores (except Discount Department Stores)
452112	Discount Department Stores

452910	Warehouse Clubs and Supercenters
452990	All Other General Merchandise Stores
453110	Florists
453210	Office Supplies and Stationery Stores
453220	Gift, Novelty, and Souvenir Stores
453310	Used Merchandise Stores
453920	Art Dealers
453991	Tobacco Stores
453998	All Other Miscellaneous Store Retailers (except Tobacco Stores)
711110	Theater Companies and Dinner Theaters
711120	Dance Companies
711130	Musical Groups and Artists
711190	Other Performing Arts Companies
711211	Sports Teams and Clubs
711212	Racetracks
711219	Other Spectator Sports
711310	Promoters of Performing Arts, Sports, and Similar Events with Facilities
711320	Promoters of Performing Arts, Sports, and Similar Events without Facilities
711410	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures
711510	Independent Artists, Writers, and Performers
712110	Museums
712120	Historical Sites
712130	Zoos and Botanical Gardens
712190	Nature Parks and Other Similar Institutions
713110	Amusement and Theme Parks
713120	Amusement Arcades
713210	Casinos (except Casino Hotels)
713290	Other Gambling Industries
713910	Golf Courses and Country Clubs
713920	Skiing Facilities
713930	Marinas
713940	Fitness and Recreational Sports Centers
713950	Bowling Centers
713990	All Other Amusement and Recreation Industries
721110	Hotels (except Casino Hotels) and Motels
721120	Casino Hotels
721191	Bed-and-Breakfast Inns
721199	All Other Traveler Accommodation
721211	RV (Recreational Vehicle) Parks and Campgrounds
721214	Recreational and Vacation Camps (except Campgrounds)
721310	Rooming and Boarding Houses
722310	Food Service Contractors

722320	Caterers
722330	Mobile Food Services
722410	Drinking Places (Alcoholic Beverages)
722511	Full-Service Restaurants
722513	Limited-Service Restaurants
722514	Cafeterias, Grill Buffets, and Buffets
722515	Snack and Nonalcoholic Beverage Bars

Source: EMSI

Healthcare Services Cluster	
NAICS (6-digit)	Description
621111	Offices of Physicians (except Mental Health Specialists)
621112	Offices of Physicians, Mental Health Specialists
621210	Offices of Dentists
621310	Offices of Chiropractors
621320	Offices of Optometrists
621330	Offices of Mental Health Practitioners (except Physicians)
621340	Offices of Physical, Occupational and Speech Therapists, and Audiologists
621391	Offices of Podiatrists
621399	Offices of All Other Miscellaneous Health Practitioners
621410	Family Planning Centers
621420	Outpatient Mental Health and Substance Abuse Centers
621491	HMO Medical Centers
621492	Kidney Dialysis Centers
621493	Freestanding Ambulatory Surgical and Emergency Centers
621498	All Other Outpatient Care Centers
621511	Medical Laboratories
621512	Diagnostic Imaging Centers
621610	Home Health Care Services
621910	Ambulance Services
621991	Blood and Organ Banks
621999	All Other Miscellaneous Ambulatory Health Care Services
622110	General Medical and Surgical Hospitals
622210	Psychiatric and Substance Abuse Hospitals
622310	Specialty (except Psychiatric and Substance Abuse) Hospitals
623110	Nursing Care Facilities (Skilled Nursing Facilities)
623210	Residential Intellectual and Developmental Disability Facilities

623220	Residential Mental Health and Substance Abuse Facilities
623311	Continuing Care Retirement Communities
623312	Assisted Living Facilities for the Elderly
623990	Other Residential Care Facilities
624110	Child and Youth Services
624120	Services for the Elderly and Persons with Disabilities
624190	Other Individual and Family Services
624210	Community Food Services
624221	Temporary Shelters
624229	Other Community Housing Services
624230	Emergency and Other Relief Services
624310	Vocational Rehabilitation Services
624410	Child Day Care Services
902622	Hospitals (State Government)
903622	Hospitals (Local Government)

Source: EMSI

Defense Cluster	
NAICS (6-digit)	Description
336611	Ship Building and Repairing
901199	Federal Government, Civilian, Excluding Postal Service
901200	Federal Government, Military

Source: EMSI

Energy and Environment Cluster	
NAICS (6-digit)	Description
211111	Crude Petroleum and Natural Gas Extraction
211112	Natural Gas Liquid Extraction
212111	Bituminous Coal and Lignite Surface Mining
212112	Bituminous Coal Underground Mining
221111	Hydroelectric Power Generation
221112	Fossil Fuel Electric Power Generation
221113	Nuclear Electric Power Generation
221114	Solar Electric Power Generation
221115	Wind Electric Power Generation
221116	Geothermal Electric Power Generation
221117	Biomass Electric Power Generation
221118	Other Electric Power Generation
221121	Electric Bulk Power Transmission and Control
221122	Electric Power Distribution
221210	Natural Gas Distribution
221310	Water Supply and Irrigation Systems
221320	Sewage Treatment Facilities
221330	Steam and Air-Conditioning Supply
237110	Water and Sewer Line and Related Structures Construction
237130	Power and Communication Line and Related Structures Construction
238210	Electrical Contractors and Other Wiring Installation Contractors
238220	Plumbing, Heating, and Air-Conditioning Contractors
325120	Industrial Gas Manufacturing
325193	Ethyl Alcohol Manufacturing
325194	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing
325199	All Other Basic Organic Chemical Manufacturing
332410	Power Boiler and Heat Exchanger Manufacturing
333413	Industrial and Commercial Fan and Blower and Air Purification Equipment Manufacturing

333414	Heating Equipment (except Warm Air Furnaces) Manufacturing
333415	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing
333611	Turbine and Turbine Generator Set Units Manufacturing
333613	Mechanical Power Transmission Equipment Manufacturing
333911	Pump and Pumping Equipment Manufacturing
333912	Air and Gas Compressor Manufacturing
333913	Measuring and Dispensing Pump Manufacturing
333994	Industrial Process Furnace and Oven Manufacturing
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing
334512	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use
334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables
334514	Totalizing Fluid Meter and Counting Device Manufacturing
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals
334516	Analytical Laboratory Instrument Manufacturing
334517	Irradiation Apparatus Manufacturing
334519	Other Measuring and Controlling Device Manufacturing
335110	Electric Lamp Bulb and Part Manufacturing
335311	Power, Distribution, and Specialty Transformer Manufacturing
335312	Motor and Generator Manufacturing
335313	Switchgear and Switchboard Apparatus Manufacturing
335314	Relay and Industrial Control Manufacturing
335911	Storage Battery Manufacturing
335912	Primary Battery Manufacturing
335929	Other Communication and Energy Wire Manufacturing
335931	Current-Carrying Wiring Device Manufacturing
423610	Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers
423690	Other Electronic Parts and Equipment Merchant Wholesalers
423720	Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers
423730	Warm Air Heating and Air-Conditioning Equipment and Supplies Merchant Wholesalers
423740	Refrigeration Equipment and Supplies Merchant Wholesalers
423930	Recyclable Material Merchant Wholesalers
454310	Fuel Dealers
486110	Pipeline Transportation of Crude Oil
486210	Pipeline Transportation of Natural Gas
486910	Pipeline Transportation of Refined Petroleum Products
486990	All Other Pipeline Transportation
541330	Engineering Services
541360	Geophysical Surveying and Mapping Services
541380	Testing Laboratories
541620	Environmental Consulting Services
541690	Other Scientific and Technical Consulting Services

541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)
562111	Solid Waste Collection
562112	Hazardous Waste Collection
562119	Other Waste Collection
562211	Hazardous Waste Treatment and Disposal
562212	Solid Waste Landfill
562213	Solid Waste Combustors and Incinerators
562219	Other Nonhazardous Waste Treatment and Disposal
562910	Remediation Services
562920	Materials Recovery Facilities
562991	Septic Tank and Related Services
562998	All Other Miscellaneous Waste Management Services

Source: EMSI

Bioscience Cluster	
NAICS (6-digit)	Description
325411	Medicinal and Botanical Manufacturing
325412	Pharmaceutical Preparation Manufacturing
325413	In-Vitro Diagnostic Substance Manufacturing
325414	Biological Product (except Diagnostic) Manufacturing
339112	Surgical and Medical Instrument Manufacturing
339113	Surgical Appliance and Supplies Manufacturing
339114	Dental Equipment and Supplies Manufacturing
339115	Ophthalmic Goods Manufacturing
339116	Dental Laboratories
541711	Research and Development in Biotechnology
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)

Source: EMSI

Agriculture, Fishing, and Food Production Cluster	
NAICS (6-digit)	Description
111000	Crop Production
112000	Animal Production and Aquaculture
113110	Timber Tract Operations
113210	Forest Nurseries and Gathering of Forest Products
113310	Logging
114111	Finfish Fishing
114112	Shellfish Fishing
114119	Other Marine Fishing
114210	Hunting and Trapping
115111	Cotton Ginning
115112	Soil Preparation, Planting, and Cultivating

115113	Crop Harvesting, Primarily by Machine
115114	Postharvest Crop Activities (except Cotton Ginning)
115115	Farm Labor Contractors and Crew Leaders
115116	Farm Management Services
115210	Support Activities for Animal Production
115310	Support Activities for Forestry
311111	Dog and Cat Food Manufacturing
311119	Other Animal Food Manufacturing
311211	Flour Milling
311212	Rice Milling
311213	Malt Manufacturing
311221	Wet Corn Milling
311224	Soybean and Other Oilseed Processing
311225	Fats and Oils Refining and Blending
311230	Breakfast Cereal Manufacturing
311313	Beet Sugar Manufacturing
311314	Cane Sugar Manufacturing
311340	Nonchocolate Confectionery Manufacturing
311351	Chocolate and Confectionery Manufacturing from Cacao Beans
311352	Confectionery Manufacturing from Purchased Chocolate
311411	Frozen Fruit, Juice, and Vegetable Manufacturing
311412	Frozen Specialty Food Manufacturing
311421	Fruit and Vegetable Canning
311422	Specialty Canning
311423	Dried and Dehydrated Food Manufacturing
311511	Fluid Milk Manufacturing
311512	Creamery Butter Manufacturing
311513	Cheese Manufacturing
311514	Dry, Condensed, and Evaporated Dairy Product Manufacturing
311520	Ice Cream and Frozen Dessert Manufacturing
311611	Animal (except Poultry) Slaughtering
311612	Meat Processed from Carcasses
311613	Rendering and Meat Byproduct Processing
311615	Poultry Processing
311710	Seafood Product Preparation and Packaging
311811	Retail Bakeries
311812	Commercial Bakeries
311813	Frozen Cakes, Pies, and Other Pastries Manufacturing
311821	Cookie and Cracker Manufacturing
311824	Dry Pasta, Dough, and Flour Mixes Manufacturing from Purchased Flour
311830	Tortilla Manufacturing

311911	Roasted Nuts and Peanut Butter Manufacturing
311919	Other Snack Food Manufacturing
311920	Coffee and Tea Manufacturing
311930	Flavoring Syrup and Concentrate Manufacturing
311941	Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing
311942	Spice and Extract Manufacturing
311991	Perishable Prepared Food Manufacturing
311999	All Other Miscellaneous Food Manufacturing
312111	Soft Drink Manufacturing
312112	Bottled Water Manufacturing
312113	Ice Manufacturing
312120	Breweries
312130	Wineries
312140	Distilleries
312230	Tobacco Manufacturing
333111	Farm Machinery and Equipment Manufacturing
333112	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing
423820	Farm and Garden Machinery and Equipment Merchant Wholesalers
424430	Dairy Product (except Dried or Canned) Merchant Wholesalers
424440	Poultry and Poultry Product Merchant Wholesalers
424450	Confectionery Merchant Wholesalers
424460	Fish and Seafood Merchant Wholesalers
424470	Meat and Meat Product Merchant Wholesalers
424480	Fresh Fruit and Vegetable Merchant Wholesalers
424510	Grain and Field Bean Merchant Wholesalers
424520	Livestock Merchant Wholesalers
424590	Other Farm Product Raw Material Merchant Wholesalers
424910	Farm Supplies Merchant Wholesalers

Source: EMSI

Creative Cluster	
NAICS (6-digit)	Description
323111	Commercial Printing (except Screen and Books)
453920	Art Dealers
511110	Newspaper Publishers
511120	Periodical Publishers
511130	Book Publishers
512110	Motion Picture and Video Production
512120	Motion Picture and Video Distribution
512191	Teleproduction and Other Postproduction Services
512210	Record Production
512220	Integrated Record Production/Distribution
512230	Music Publishers
512240	Sound Recording Studios

512290	Other Sound Recording Industries
515111	Radio Networks
515112	Radio Stations
515120	Television Broadcasting
519120	Libraries and Archives
541310	Architectural Services
541320	Landscape Architectural Services
541410	Interior Design Services
541420	Industrial Design Services
541430	Graphic Design Services
541490	Other Specialized Design Services
541810	Advertising Agencies
541850	Outdoor Advertising
541860	Direct Mail Advertising
541890	Other Services Related to Advertising
541921	Photography Studios, Portrait
541922	Commercial Photography
611610	Fine Arts Schools
711110	Theater Companies and Dinner Theaters
711120	Dance Companies
711130	Musical Groups and Artists
711190	Other Performing Arts Companies
711310	Promoters of Performing Arts, Sports, and Similar Events with Facilities
711410	Agents and Managers for Artists, Athletes, Entertainers, and Other Public Figures
711510	Independent Artists, Writers, and Performers
712110	Museums
712120	Historical Sites

Source: EMSI

Advanced Manufacturing Cluster	
NAICS (6-digit)	Description
331110	Iron and Steel Mills and Ferroalloy Manufacturing
332111	Iron and Steel Forging
332112	Nonferrous Forging
332114	Custom Roll Forming
332117	Powder Metallurgy Part Manufacturing
332119	Metal Crown, Closure, and Other Metal Stamping (except Automotive)
332215	Metal Kitchen Cookware, Utensil, Cutlery, and Flatware (except Precious) Manufacturing
332216	Saw Blade and Handtool Manufacturing
332311	Prefabricated Metal Building and Component Manufacturing
332312	Fabricated Structural Metal Manufacturing
332313	Plate Work Manufacturing
332321	Metal Window and Door Manufacturing
332322	Sheet Metal Work Manufacturing
332323	Ornamental and Architectural Metal Work Manufacturing
332410	Power Boiler and Heat Exchanger Manufacturing

332420	Metal Tank (Heavy Gauge) Manufacturing
332431	Metal Can Manufacturing
332439	Other Metal Container Manufacturing
332510	Hardware Manufacturing
332613	Spring Manufacturing
332618	Other Fabricated Wire Product Manufacturing
332710	Machine Shops
332721	Precision Turned Product Manufacturing
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing
332811	Metal Heat Treating
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring
332911	Industrial Valve Manufacturing
332912	Fluid Power Valve and Hose Fitting Manufacturing
332913	Plumbing Fixture Fitting and Trim Manufacturing
332919	Other Metal Valve and Pipe Fitting Manufacturing
332991	Ball and Roller Bearing Manufacturing
332992	Small Arms Ammunition Manufacturing
332993	Ammunition (except Small Arms) Manufacturing
332994	Small Arms, Ordnance, and Ordnance Accessories Manufacturing
332996	Fabricated Pipe and Pipe Fitting Manufacturing
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing
333111	Farm Machinery and Equipment Manufacturing
333120	Construction Machinery Manufacturing
333131	Mining Machinery and Equipment Manufacturing
333132	Oil and Gas Field Machinery and Equipment Manufacturing
333241	Food Product Machinery Manufacturing
333242	Semiconductor Machinery Manufacturing
333243	Sawmill, Woodworking, and Paper Machinery Manufacturing
333244	Printing Machinery and Equipment Manufacturing
333249	Other Industrial Machinery Manufacturing
333314	Optical Instrument and Lens Manufacturing
333316	Photographic and Photocopying Equipment Manufacturing
333318	Other Commercial and Service Industry Machinery Manufacturing
333413	Industrial and Commercial Fan and Blower and Air Purification Equipment Manufacturing
333414	Heating Equipment (except Warm Air Furnaces) Manufacturing
333415	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing
333511	Industrial Mold Manufacturing
333514	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing
333515	Cutting Tool and Machine Tool Accessory Manufacturing
333517	Machine Tool Manufacturing

333519	Rolling Mill and Other Metalworking Machinery Manufacturing
333611	Turbine and Turbine Generator Set Units Manufacturing
333612	Speed Changer, Industrial High-Speed Drive, and Gear Manufacturing
333613	Mechanical Power Transmission Equipment Manufacturing
333618	Other Engine Equipment Manufacturing
333911	Pump and Pumping Equipment Manufacturing
333912	Air and Gas Compressor Manufacturing
333913	Measuring and Dispensing Pump Manufacturing
333921	Elevator and Moving Stairway Manufacturing
333922	Conveyor and Conveying Equipment Manufacturing
333923	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing
333924	Industrial Truck, Tractor, Trailer, and Stacker Machinery Manufacturing
333991	Power-Driven Handtool Manufacturing
333992	Welding and Soldering Equipment Manufacturing
333993	Packaging Machinery Manufacturing
333994	Industrial Process Furnace and Oven Manufacturing
333995	Fluid Power Cylinder and Actuator Manufacturing
333996	Fluid Power Pump and Motor Manufacturing
333997	Scale and Balance Manufacturing
333999	All Other Miscellaneous General Purpose Machinery Manufacturing
334111	Electronic Computer Manufacturing
334112	Computer Storage Device Manufacturing
334118	Computer Terminal and Other Computer Peripheral Equipment Manufacturing
334210	Telephone Apparatus Manufacturing
334220	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing
334290	Other Communications Equipment Manufacturing
334310	Audio and Video Equipment Manufacturing
334412	Bare Printed Circuit Board Manufacturing
334413	Semiconductor and Related Device Manufacturing
334416	Capacitor, Resistor, Coil, Transformer, and Other Inductor Manufacturing
334417	Electronic Connector Manufacturing
334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing
334419	Other Electronic Component Manufacturing
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing
334512	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use
334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables
334514	Totalizing Fluid Meter and Counting Device Manufacturing
334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals
334516	Analytical Laboratory Instrument Manufacturing
334517	Irradiation Apparatus Manufacturing

334519	Other Measuring and Controlling Device Manufacturing
334613	Blank Magnetic and Optical Recording Media Manufacturing
334614	Software and Other Prerecorded Compact Disc, Tape, and Record Reproducing
335110	Electric Lamp Bulb and Part Manufacturing
335121	Residential Electric Lighting Fixture Manufacturing
335122	Commercial, Industrial, and Institutional Electric Lighting Fixture Manufacturing
335129	Other Lighting Equipment Manufacturing
335210	Small Electrical Appliance Manufacturing
335221	Household Cooking Appliance Manufacturing
335222	Household Refrigerator and Home Freezer Manufacturing
335224	Household Laundry Equipment Manufacturing
335228	Other Major Household Appliance Manufacturing
335311	Power, Distribution, and Specialty Transformer Manufacturing
335312	Motor and Generator Manufacturing
335313	Switchgear and Switchboard Apparatus Manufacturing
335314	Relay and Industrial Control Manufacturing
335911	Storage Battery Manufacturing
335912	Primary Battery Manufacturing
335921	Fiber Optic Cable Manufacturing
335929	Other Communication and Energy Wire Manufacturing
335931	Current-Carrying Wiring Device Manufacturing
335932	Noncurrent-Carrying Wiring Device Manufacturing
335991	Carbon and Graphite Product Manufacturing
335999	All Other Miscellaneous Electrical Equipment and Component Manufacturing
336111	Automobile Manufacturing
336112	Light Truck and Utility Vehicle Manufacturing
336120	Heavy Duty Truck Manufacturing
336211	Motor Vehicle Body Manufacturing
336212	Truck Trailer Manufacturing
336213	Motor Home Manufacturing
336214	Travel Trailer and Camper Manufacturing
336310	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing
336320	Motor Vehicle Electrical and Electronic Equipment Manufacturing
336330	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing
336340	Motor Vehicle Brake System Manufacturing
336350	Motor Vehicle Transmission and Power Train Parts Manufacturing
336360	Motor Vehicle Seating and Interior Trim Manufacturing
336370	Motor Vehicle Metal Stamping
336390	Other Motor Vehicle Parts Manufacturing
336411	Aircraft Manufacturing
336412	Aircraft Engine and Engine Parts Manufacturing

336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing
336414	Guided Missile and Space Vehicle Manufacturing
336415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing
336510	Railroad Rolling Stock Manufacturing
336991	Motorcycle, Bicycle, and Parts Manufacturing
336992	Military Armored Vehicle, Tank, and Tank Component Manufacturing
336999	All Other Transportation Equipment Manufacturing
423820	Farm and Garden Machinery and Equipment Merchant Wholesalers

Source: EMSI

Maritime Cluster	
NAICS (6-digit)	Description
336612	Boat Building
441222	Boat Dealers
483114	Coastal and Great Lakes Passenger Transportation
487210	Scenic and Sightseeing Transportation, Water
488320	Marine Cargo Handling

Source: EMSI

Camoin Associates, Inc.
120 West Avenue, Suite 303
Saratoga Springs, NY 12866

518.899.2608
www.camoinassociates.com
@camoinassociate

camoin associates
ECONOMIC DEVELOPMENT

Appendix B

Summary of Public Input

Southeastern Connecticut Enterprise Region

CEDS Strategy Committee

December 2016

Southeastern CT Enterprise Region2016 Comprehensive Economic Development Strategy Public Input Summary

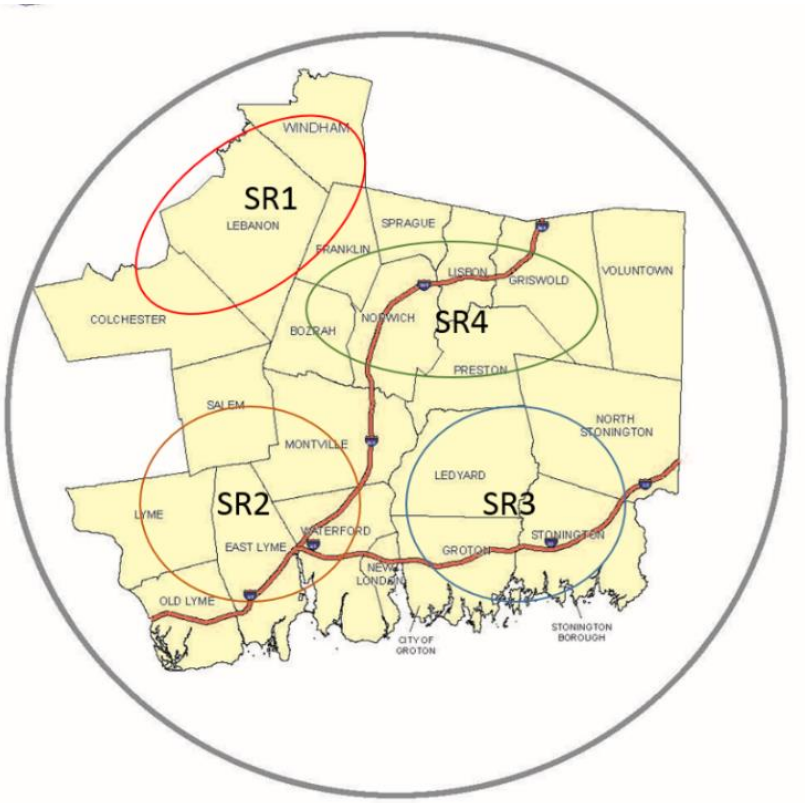
CEDS Steering Committee

Southeastern CT Enterprise Region

December 2016

seCTer, in partnership with many local and regional organizations, stakeholders, and economic development professionals, conducted a number of events in the region to provide ample opportunity for all residents and stakeholders to provide their valuable input. The following is summary of the public input gathered to inform and strengthen the **2017 Comprehensive Economic Development Strategy** for Southeastern Connecticut.

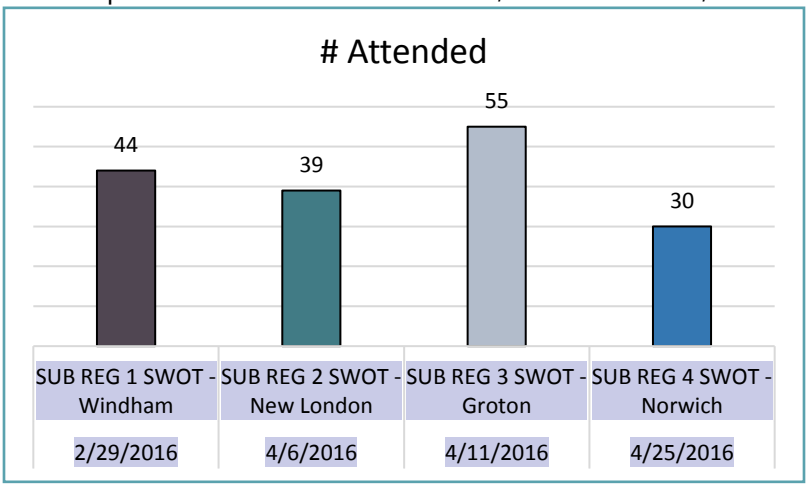
A particularly common theme that emerged in all the different discussions was, in order to remain competitive/relevant and maintain any vibrancy in our communities, we need to attract and retain young professionals, innovative entrepreneurs as well as affluent retirees by aggressively marketing our assets, and investing in programs and infrastructure that create or facilitate connections to economic, social and recreational opportunities here in Southeastern Connecticut (SECT). The primary barriers identified were a lack of coordination and operative networks between organizations (governmental, nonprofit, private); and a lack of integrated and streamlined systems (transportation, education/career pathways, regulatory). This results in damaging inefficiencies and in competition for increasingly scarce resources. The fiscal instability and uncertainty at all levels of government, and locally in the form of lower incomes and less profit have dramatically diminished the social and financial capital available to invest in the infrastructure, institutions, organizations, programs and projects designed to strengthen the communities in SECT and facilitate prosperity and growth.



It is widely recognized that the economy will not recover from the significant structural change that has occurred over the last eight to ten years. The techniques and best practices of the past are also no longer as relevant and will therefore not be as effective to repair the damage. The changing demographics and constantly evolving technology bring a new set of criteria for attraction and retention and a concurrent need for continual innovation, adaptation and a new mindset that will successfully disrupt the 20th Century thought and practices that continue to confine and constrain. Knowledge, human capital/collaboration, and efficiency are the new resources for economic development and the art of attraction a valued skill.

Sub-regional SWOT Analyses

The public input process began with four sub-regional SWOT analyses to determine the region's strengths, weaknesses, opportunities and threats. The sessions were held in Willimantic, New London, Norwich and Mystic and were facilitated/moderated by members of the CEDS Strategy Committee. The following chart shows the number of participants per event. Participants included business owners, elected officials, state representatives, residents, board and commission members, representatives from local and regional non-profit and governmental agencies and industry representatives. A regional SWOT analysis was also conducted by The Southeastern CT Council of Governments in April 2015, with 24 in attendance.



Participants were broken into four groups and asked to identify regional strengths and weaknesses internal to the region as well as external threats impacting the region. Participants were then asked to suggest opportunities based on the items identified. During the final 15 minutes of the break-out session, participants were given 20 stickers and asked to use 10 stickers to vote on the Strengths and Opportunities they felt were higher priority and 10 stickers to identify the top Threats and Weaknesses. The votes were tallied and each group reported their top Strengths, Weaknesses, Threats and Opportunities to the re-convened participants.

All the data received was summarized and the following emerging themes, clusters and skills were identified:

Emerging Themes - Strengths

- **Sense of Place**: History, Location between NY and Boston, quality of life, recreational opportunities, villages / shoreline / open space
- **Existing economic diversity** on which to build (mature business and new economy)
- Ready **economic development resources**: workforce, available investment opportunities
- **Infrastructure** assets and possibilities: rail, air, marine, utilities, broadband
- Strong **training and education** institutions

Emerging Themes - Opportunities

- Develop **Community Leaders** – increase involvement from millennials to retirees
- **Diversify the economic base** beyond Pfizer, EB, casinos – supply chain, small business, technology, entrepreneurs
- Core components exist for efficient, integrated **infrastructure** – transportation and utilities
- Benefits for **Regionalization** seen: regulatory, government, education, shared services
- Streamlined **Regulations** can promote economic development, particularly zoning
- Define SECT's **'Sense of Place'** – and promote it!

Emerging Themes - Weaknesses

- **Lack of leaders / visionaries** or coordinated leadership
- Too dependent on a few businesses (e.g. Electric Boat, Pfizer); need for **business diversity**
- Not addressing **skill sets** needed for the new economy; **brain drain**
- **Fragmented transportation** networks and **utility** service
- Failure to **regionalize**; provincialism hampers realizing economies of scale
- **Outdated regulations** stymie development
- **Regional marketing** efforts inadequate; Sense of Place not obvious

Emerging Themes - Threats

- **Resiliency**: over-reliance on large companies like Electric Boat, Pfizer, casinos
- **Economic insecurity** drives workforce exodus
- **Sea-level rise** threatens coast-line resources
- **Resistance to change**, e.g. consider regionalized approaches or reform regulations
- **Uncertainty over state budget** for local support; burden for towns falls on inefficient property tax system
- Without a 'Sense of Place', **civic pride is undermined**

ECONOMIC CLUSTERS STRENGTHS: SUPPORTING INSTITUTIONS (SPECIFICALLY IDENTIFIED)

- Agriculture / aquaculture / open space: farm-to-table movement
  - Haley Farm, Patchaug State Forest (North Stonington and Voluntown), Last Green Valley, Lebanon preserved land
- Bioscience / Healthcare:
  - Pfizer, CURE, UCONN TIP, Entrepreneurs, SPARK Makerspace; Lawrence & Memorial Hospital, William C. Backus Hospital, Windham Hospital, Yale and Hartford Hospital affiliations, Cancer Centers, Senior Care facilities
- Defense Industry:
  - Electric Boat, U.S. Naval Submarine Base, Quonset Point (synergy), TASMG (Helicopter Repair) and other supply chain businesses
- Education: technical and higher education
  - U.S. Coast Guard Academy and R&D Center, UCONN Avery Point, Eastern Connecticut State University, Connecticut College, Mitchell College, Three Rivers Community College, Quinebaug Valley Community College, Windham Technical High School, Ella Grasso Technical High School, Charter and Magnet Schools
- Maritime: New London deep-water port, fishing
  - State Pier, Mystic Seaport, LI Ferry
- Tourism / Hospitality: history, culture, and recreation
  - Mystic Seaport, Mystic Aquarium, Foxwoods Resort Casino, Mohegan Sun Casino; proposed U.S. Coast Guard Museum, Dodd Stadium, Groton Bank, Noank, Thames River Region and Thames River Heritage Park, Herry's

Supporting Foundation: Skills

- Bio-pharmaceutical Scientists, Computer Scientists
- Nuclear, Acoustic, Electrical, Structural, Civil and Mechanical Engineers; IT Professionals; Advanced manufacturing; pipe-fitters; machinists; robotics;
- Doctors, Nurses; Physical Therapists; Specialists; Lawyers;
- Educators; Researchers; Economists; Financial Advisors; Accountants; Regulatory Professionals;
- Entrepreneurs; Designers; Media
- Artists; Interpreters; Actors; Animal Trainers;
- Agri-scientists; Soil Scientists; Land Surveyors;

Stakeholder Prioritization

The following are the combined results of the prioritization exercises conducted (the number in parentheses is the total number of votes associated with the broad theme identified.)

STRENGTHS	WEAKNESSES
Quality of Life (265): arts, cultural, historic and natural resources; tourism and recreational opportunities; rural-urban mix; quality schools and healthcare Economic Development Resources & Competitive Advantages (145): proximity to larger urban centers; skilled, productive & educated workforce; convenient location with lower operating costs (than larger urban centers) Transportation Systems and Existing Infrastructure (71): multiple transportation modes (passenger & freight rail, airports, deep water port w/ rail connection, Port Authority, ferry, highway system Water/Maritime Resources (52): rivers, LI Sound, ocean/coastline; recreational and economic opportunities; shipbuilding/Mystic Seaport Existing Businesses and Institutions (37): Millstone, educational institutions, USCGA, Quonset Point synergy, national IT/digital media hub; military presence - defense industry	Regulatory Environment/ Government (138): state & local regulatory situation; restraints to development; commissioners unfamiliar with trends and not familiar with private sector needs; resistance to development; imbalanced land-use policies throughout region; outdated complex regulations; taxes in general; tax system; over-reliance on property tax; SECT not recognized in Hartford Quality of Life/Sense of Place (134): lack of marketing and education about assets and attractions; poor perception/image; high COL/taxes/doing business etc.; lack of jobs and opportunities; stagnant employment; lack of a regional brand; not millennial friendly; lack home ownership opportunities/housing affordability; need to build future workforce Transportation & Infrastructure (112): lack of convenient public transit, available connections to larger urban centers, and coordinated regional transportation system; disconnected, deteriorated, and underutilized infrastructure; lack of shovel ready sites & no one willing to pay to make them so Diversification & Resilience (53): not adapting to the needs of the new economy; need to diversify – fail to capture talent when large industries downsize; lack of coordinated leadership and visionaries; no engagement from younger generations or area educational institutions Regionalization (43): region not united- silo mentality; competition for resources Environmental (3): heavily reliant on septic systems; too many brownfields

OPPORTUNITIES	THREATS
Business Expansion & Retention (101): more support for entrepreneurs; expand manufacturing supply chain; Invest in technology and green energy Regionalization (75): regional authority, schools; shared services; regional marketing opportunities Development & Re-development (60): mixed-use/cluster development; walkable neighborhoods; marketing and redevelopment/infill of existing old buildings & mills; repurpose and reuse historic buildings and urban areas Tourism & Marketing (51): one regional marketing and branding campaign; build our regional pride, promote our success and assets; more organized and coordinated effort to market events and attractions for a more holistic experience; better signage Location & Industry Specific (47): leverage and expand assets related to the ocean/harbor/waterfront; Leverage US Coast Guard Museum and Thames River Heritage Park Attracting & Retaining Millennials & Retirees (41): become millennial friendly; advertise assets; expand geriatric support, facilities/networks Regulatory – Planning for Economic Development (41): streamline/improve regulatory process & gov't services; increase # of shovel-ready properties; ease regulations for businesses Transportation (29): local use of rail ; expansion of freight and passenger rail; utilize & improve existing transportation infrastructure, capacity & connections Education & Workforce Development (28): train for future (diversify students); pilot programs for technical education in middle schools & high schools; teach technical schools in ALL high schools, not just technical schools; further integrate K-12 with technical schools, community colleges & universities Diversification of the Economy (24): diversify the economy – explore advanced nuclear manufacturing; need to diversify economic base to increase resiliency; opportunities for diverse businesses due to diverse demographics; diversity breakthrough Agriculture: Innovation & Sustainability (22): food security – more local farms and processing; greenhouses and value-added products; agricultural infrastructure development; utilize technology to expand agricultural industries; increase farm-to-table programs; expand shellfish/aquaculture industries Building Social Capital (15): integrate minorities onto boards & commissions; get millennials involved with Chambers, civic organizations, boards & commissions	Regulatory & Government related (203): tax situation – prohibitive to growth and attraction of new business and people; State budget/fiscal instability; over taxation and regulation; zoning – barrier to growth Diversification/Economic Resilience (104): overreliance on large employers – not resilient to downsizing or changes in the economy; out-migration of young talent and retirees; possible 3rd Casino Sense of Place/Quality of Life (46): lack of mixed-use areas with housing; SECT a forgotten place; poor image and disinvestment in some areas; lack jobs and housing for millennials Environmental Threats (21): climate change- sea level rise and shoreline erosion; water quality and commercial impacts Lack of Regionalism (17): lack of regional collaboration and coordination; silo mentality; towns competing with each other for resources and tax revenue; Infrastructure Related (16): lack of municipal sewers; weak infrastructure supporting the PORT/transportation barriers; not resilient – slow to recover from power outages; energy grid vulnerability Global Threat (1): Millstone

Southeastern Connecticut Council of Governments: Regional Plan of Conservation and Development Initial Public Input Workshop

On June 24, 2015 the Southeastern CT Council of Governments (SCCOG) held a public workshop at the Montville Town Hall to kick-off the process to update the 2007 Regional Plan of Conservation and Development. Approximately 24 people attended from: Lebanon, East Lyme, Windham, Stonington, North Stonington, Ledyard, Groton, Groton City, Lisbon, Preston and Montville. Attendees were broken into two groups and brainstormed the region's strengths, weaknesses and opportunities. Each attendee then selected their top three strengths, top three weaknesses and top three opportunities. The groups reconvened and shared their results.

REGION'S TOP STRENGTHS:

- History and historic sites
- Open space and agriculture
- Quality of life
- Roads, highways, and connectivity
- Skilled workforce
- Variety in physical environment / landscapes

REGION'S TOP WEAKNESSES:

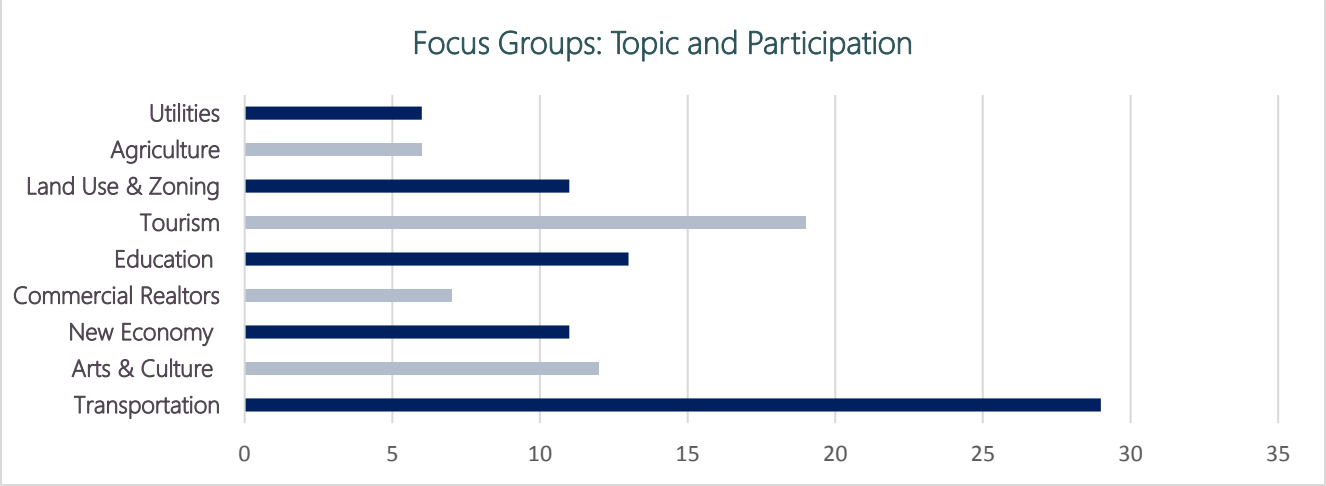
- Lack of employment opportunities
- Failing infrastructure
- Economic and employment stability
- Size and cost of government
- Lack of local mass transit
- Lack of personal responsibility to maintain and invest in properties

REGION'S TOP OPPORTUNITIES:

- Regionalization and cost sharing (e.g., fire, education). The SCCOG is proactive, non-partisan.
- Potential for urban revival – people want to live in cities, so let's market them and attract young people
- Take advantage of our historic resources for preservation and for economic development
- Infrastructure – power, water, and gas
- Marketing – tourism and businesses
- Railroad, marine

A Closer Look: Targeted Focus Groups

In addition to the 4 Sub-regional SWOT Events, seCTer hosted a series of targeted focus groups to explore select topics identified in the SWOT analyses as having a significant impact to Economic Development.



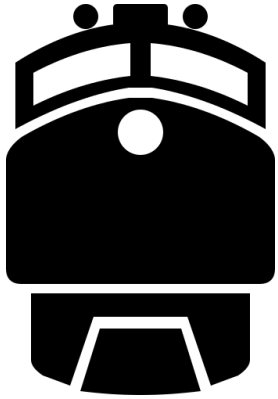
TRANSPORTATION

CONNECTICUT AIRPORT AUTHORITY

The Transportation Focus Group was held at the Groton – New London Airport, Mystic Jet Center on March 30, 2016. There were 29 participants in the focus group discussion with two moderators: Catherine Young, from the Connecticut Airport Authority and Juliet Hodge from the Southeastern CT Enterprise Region.

Major Themes

- Need to meet the access and mobility needs of residents, visitors, students, commercial enterprises and industry by creating a more integrated and efficient transportation system that addresses the changing demographics, our rural-suburban landscape and lack of population density, and that provides a more seamless transition from different transit and non-motorized modes (last mile connections; housing, employment, healthcare and social opportunities that is accessible (ADA and by transit and walking) - particularly for those without a car (e.g. students, aging populations, low-income populations and those who prefer alternative modes of transportation).
- Utilize new technologies to increase efficiency and access; one-payment option, mobile apps, better connectivity, headways, signage and information (both digital and print). Study the capacity and redundancy of transit modes and paratransit as well as local special transit (school, senior) to enable efficiencies and better coordination. Better way finding (signage, apps, marketing), better coordination between transportation agencies/modes.
- Reduce conflicts between transportation modes – e.g. rail and water uses; passenger vs. freight use of tracks, etc. Eliminate access barriers for cyclists and pedestrians and improve safety for non-motorists to enable biking and walking (seen as a tourism asset and a reasonable alternative to car ownership/use).
- Embrace a mindset that values regional benefits over local benefits with a guiding principle or goal of serving the public; one that is open to new technologies and new modes of transportation.
- Challenged with finding ways (and funds) to accommodate one mode of transportation without negatively impacting another. Also challenges related to how to adapt existing physical infrastructure to accommodate cyclists and pedestrians, new bigger submarines, greater freight loads/car widths, expanded passenger rail, and charging stations (narrow built-out streets, channel depth, rail siding height, etc.).
- Assess climate change impacts on storm drainage systems and roadways which in the event of an emergency could fail and develop a plan to mitigate the dangers.



Education

The Education Focus Group took place at UCONN Avery Point on May 24th. Steve MacKenzie and Juliet Hodge of seCTer moderated the session. There were 13 participants mostly representing area high schools and secondary educational facilities.

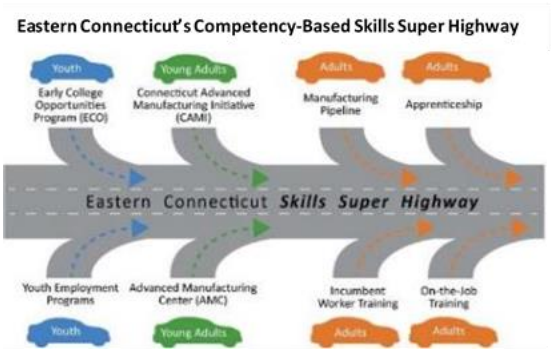
Major Themes

- Mindset and resistance to change: **Many have fixed an antiquated mindset** that does not align with or prepare for likely future scenarios or paradigms. **Fear of change – resistant to remove existing "structure."**
- Critical Skills – Preparedness – Growth Mindset: **Must transition from an educational system designed for the industrial age to a system designed for the future business needs and that focuses on preparedness, competency, design and creativity.** Paint a clear picture of the future and plan accordingly – create curriculum to support emerging trends.
  - Success in the 21st Century requires a "growth mindset" which recognizes the importance of **critical thinking, collaboration, creativity and communication**. The lack of this growth mindset and over-reliance on structure is prohibitive with respect to entrepreneurship.
  - **Common core standards are shifting** and will focus on preparing the student. Invest in students, then brand the message that we are investing in our students. **Need to stop creating careers that actively avoid critical skills.** High school students lack math skills to fill engineering jobs available in the region.
- Regional Schools: This region is too small to be competitive at the k-12 level. **Charter schools need to partner with public schools and share resources.**
- Education – Entrepreneurship - Messaging: Kids taught that failure if bad (test score as measurement). Entrepreneurship involves failure (often multiple failures) which goes against what they have been taught. **Process is too structured**. Taught to go to college and **get** a job. Not told often to acquire basic skills, be creative and start your own company. Removing the structure is uncomfortable to many. Some do want to be entrepreneurs, but **lack the basic skills needed to be a successful entrepreneur** as these are not always taught. **Soft-skills training** necessary.
- Partnership and funding challenges - impact on education: **Lack of Angel Networks in SECT** make entrepreneurship difficult. Need to create an angel fund and brand it: **"People in the community investing in community". Collaboration needed to create pathways and networks to attract investors**.
  - **Void in the region** identified. EB and Pfizer no longer as engaged with the community. This lack of funding highlights the importance of **being more efficient** – sharing resources – **cooperating vs competing.**

- The value is not clear to investors or partners. Need to do a better job of packaging (and marketing) the opportunities and assets we have here to compel them to act. Sometimes there is enthusiasm within an industry, but a reluctance to give resources necessary to achieve strategies.
- Diversity a plus in SECT – many opportunities for collaboration.

- Education – Business Connection: Some marketing needed to educate businesses about the resources and opportunities that could result from a partnership with area schools. Joint responsibility between schools and businesses to ensure that students are prepared. Work-place learning key.

  Challenge: Need to replace aging workforce. When the need becomes obvious and compelling, companies more likely to engage with ED Institutions in training programs.



- Career Pathways: SECT is focused on Manufacturing, but there are other opportunities. Clear education to career pathways must be developed for the other industries in SECT. "Mapping" the path for hospitality, tourism, healthcare, theater or arts, etc. Create a "hot bed" of activity here in SECT
  - Progressive emersion programs with local business needed.
  - "Country Club Generation" – challenging generation – not willing to start at the "bottom" (low wage job) despite opportunities here in SECT. They want to be successful right out of the gate and have the freedom to try multiple careers and are in fact likely to have 7-12 careers.

Arts and Culture

The Arts and Cultural Focus group was held on May 16, 2016 in partnership with the Southeastern CT Cultural Coalition. Steve MacKenzie and Juliet Hodge of seCTer moderated the session. There were 12 participants in attendance.

SOUTHEASTERN CONNECTICUT CULTURAL COALITION

windham ARTS

Why support the Arts?

Help with employee retention

Will help diversify the age of the population

Talent pool- interns and potential labor pool

Will improve region's (or local) brand

Potential for on-site programs (internal)

Team-building aspect

Arts contribute to a high QOL which will help attract talent by creating an environment that young people/new employees want to live in

Major Themes - Strengths

- Abundance of arts & cultural assets in the Region- many choices for young and old audiences. "Mystic" name recognition powerful.
- Dedicated people involved in the arts & culture community and a wide-range of talent - all mediums. Self-driven and self-contained.
- Arts and culture can provide opportunities to diversify; creative design industries in SECT; SPARK Makerspace work attempting to build the economy by building capacity.
- NPOs feed the for profit businesses.

Major Themes – Threats and Weaknesses

- Lack of suitable, available, affordable, and code compliant facilities for the arts; renovation cost prohibitive and not an investment priority for state and towns; better collaboration to utilize the space that is available.
- Mindset that Arts are a luxury – subject to budget cuts - reduces future audience for arts; lack of public transportation also threatens the arts.
- Location between Boston and NYC – detrimental (hard to compete with larger urban areas with thriving arts and cultural sector).
- Information needed on how to maneuver the tax system, regulatory system, etc. when transitioning from hobby to actual business; artists protective of artistic freedoms.

- Marketing efforts not as effective as they could be - not always reaching the right audience or already captive audience – Not telling our story here in SECT.
- Not enough collaboration and/or communication between all arts and cultural organizations. Over-reliance on grants. Competition for scarce resources.
- Silo effect - arts and technology type curriculums are very separate in schools. Need to bring them together (e.g. sculpture and analytic geometry); art is an expression - we are not valuing all the "pockets" of art.

Major Themes – Opportunities

- Attract and retain new audiences and new talent - (millennials) by blending new technology and traditional mediums; include technological displays and approaches - (competing with FB, Snapchat etc.); increase internship or competition opportunities in the arts.
- Promote "story-telling" Need to develop "OUR" REGIONAL story and promote on a REGIONAL scale. Communicate the arts/cultural resources to the military community, realtors and corporations. Encourage them in turn to promote our rich arts and cultural assets; leverage the robust a platform for the creative economy; Good diverse economic climate necessary for all sectors to thrive.
- Communicate the arts/cultural resources to the military community, realtors and corporations. Encourage them in turn to promote our rich arts and cultural assets; Harness our strong global connections; link with Providence, Boston, Windham, Hartford etc.
- Corporate buy-in and support through career pathway programs (curriculums); encourage cross pollination - e.g. engineers/arts/technology.
- Quantify the cultural and economic impact of Arts on the economy- promote as an economic driver; educate educators, municipal officials, commissions etc. of the importance and contribution to the economy; bring arts into the conversation via representation on boards and commissions in all 22 towns.
- Collaboration and mindset: more horizontal communication and coordination between venues; regional approach; funding through regional agency vs. individual entities; expand synergy between tourism and businesses – expand tourism markets; offer package deals for employees to help with recruitment.

Entrepreneurship and the New Economy

Juliet Hodge of seCTer moderated the Entrepreneurship and New Economy Focus group that was held on May 16, 2016 in partnership with the SPARK Makerspace. There were 11 participants in attendance.

Major Themes: Threats and Weaknesses

- Outdated and limiting "Walmart Mentality" – i.e. sticking with what works even if we don't like it. We fear revolution and "settle" out of need; all the ideas are out there, but there is no network for implementation. Things only change when we want them to change. Passion necessary.
- Most problems are not black and white - cannot get rid of one thing without replacing it with another.
- Shift away from "the job" where people are just widgets/interchangeable part. People are willful and creative and the current system doesn't work for them. Concept of "jobs" is outdated. People now are interested in "work" - doing lots of different things rather than one "job."
- Technology and education - dehumanization of work and education; not looking at the skills of the existing people. People also undervalue/underutilize existing inherent skills. We teach old lessons to the new generation.
- Debt is a huge part of the 99% and given at the most vulnerable time. Hard enough to start things (education, business, etc.) - shouldn't add debt to the picture.
- Education system not aligned with reality and therefore hard to keep current. Education is a sorting system - stronger ideas/motivation survive. Education system is designed for the industrial age - or serving itself. Standardized tests vs. critical thinking, active participation and hands on learning.

Major Themes - Opportunities

- Re-localization - local production for local consumption to create economic opportunities. Reinvent "the commons"; focus on renewable energy as a capital resource; local food; support programs like FRESH - Magnet School; asset focused story-telling - keep the "capital" under local control.
- Education System: Need to modernize education system - curriculums cannot keep up with the changing technology; need more disruptive education: skills vs degree – discovery vs. memorization - learning for the sake of learning at school vs. skills application to a job (these concepts need to be joined).
- Opportunity to create learning hubs – accreditation for individual on-line courses/programs.
- Need educational programs to build entrepreneurship; bring multiple skills to a problem – build networks; shape work around people; teach collaboration and critical thinking.
- Capacity Building: bring automation available for larger industries to the small entrepreneurs and small businesses to allow them to be competitive; provide access to tools, robotics, equipment, 3-D printers etc. for everyone to free up time for creativity.
- Brand the "movement!" Raise awareness - create networks -leverage internet technology platforms; continue having discussions with polite friction.

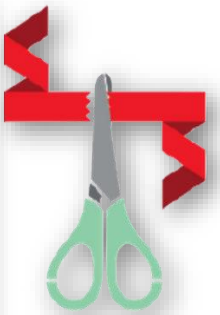
Commercial Realtors

seCTer staff conducted a mini-SWOT analysis with the Commercial Realtor group at their regular monthly meeting in June, 2016. There were only seven brokers in attendance. Though further discussions have occurred with the commercial brokers at other monthly meetings hosted by the Eastern CT Association of Realtors (ECAR).

Strengths	Weaknesses
▶ Mom & Pops are driving economy	▶ Hartford sentiment is poor; legislature is complacent and arrogant; no bipartisanship ▶ Taxes and over regulation are crushing businesses; too much government in CT ▶ Chamber of Commerce for Eastern CT is a shill for Hartford/Governor; need more candor ▶ Lack of affordable housing in region
Opportunities	**Threats**
▶ Streamline permitting and regulations, on a regional level where possible ▶ Continue to support small business, Mom & Pops ▶ Widening of I-95 ▶ Regionalism - more cooperation between Norwich - New London - Groton	▶ It has been 10 years since real estate has appreciated in SECT ▶ Public and real estate community are not being kept informed about the I-95 Widening project; not participating in the process ▶ Companies will not locate to CT given uncertainty in Hartford (taxes, regulations)

Final Focus Groups

The last three focus groups were held at the conference center in the Mohegan Sun Casino on September 1st. Staff from multiple organizations facilitated discussions on Agriculture, Land-Use and Zoning and Tourism. Having the three sessions on the same evening allowed for networking opportunities and cross-sharing of discussion results. There were approximately 40 in attendance.



Land-Use and Zoning

Juliet Hodge and Ned Hammond, City of New London, facilitated this lively session. The 11 attendees included area land-use planners, commercial realtors and local developers.

Major Themes: Threats and Weaknesses

- Multiple boards and commission reviews for simple projects. Not enough trust in professional staff to allow more administrative review/approval.
- Lengthy and costly permitting and review process. The market conditions have changed by the time you get through the process. "Guilty until proven innocent" attitude toward applicants. Regulations inflexible and not aligned with existing market conditions and/or emerging trends.
- Outdated, confusing/conflicting regulations that commissions are slow to fix– can kill a project. Excessive requirements that add to time and cost to project.
- Too many boards and commissions – uncoordinated planning efforts and often at odds with each other.
- Too many different zone categories and too many Special Permits as a tool to control development; overkill. Zoning is a barrier to development.
- Disconnect between commissions and professionals.
- Volunteer board and commission members untrained. Terms too long. Members not representative of whole community (lack diversity). Real and perceived barriers to participation on boards and commissions.
- NIMBYism is a barrier to growth. Planning has become reactionary not intentional.

Major Themes – Opportunities

- Simplify the Zoning Regulations and streamline the permitting and review process. Add flexibility and work toward regional uniformity. Begin with regional zoning categories, definitions, and language pertaining to the permitting process.
- Enable the private sector to take advantage of opportunities. Provide active town guidance/customer service through the whole development process.
- Align risk management sensibilities to economic realities. Develop an advocacy tool necessary to get regulations to align with the market conditions and trends.
- Vet the prospective members of planning and zoning commissions to ensure more progressive thinkers who consider the greater good of the community, and to find members with key skills.
- Allow more administrative review and approvals. Reduce the number of land-use agencies.
- Combine EDC and PZC as part of a larger effort to reduce the number of boards and commissions and address the disconnect between the two often differing groups.
- Create job descriptions for board and commission members, provide training, and consider term limits for board and commission members.
- Utilize technology to facilitate greater participation on boards and commission from a more diverse demographic (age, ethnicity, core competency/experience). Find ways to influence the planning process without having to be a part of the process directly.
- Plan for millennials – zoning needs to be more open to change – more flexible. Incentivize the type of development that millennials want.
- Actively and intentionally plan how to make better use of available space and opportunities. Create a sense of place and use it as a unifier.

Agriculture

Bob Mills, NCDC and Ann Chambers, seCTer facilitated this session. The six attendees included four local farmers and two from agriculture related organizations.

Major Themes: Challenges

- Very few USDA licensed slaughterhouses or processing facilities nearby – and not a single one in CT for meat producers. Diversification of product is a problem. Getting to all the farmers' markets is too costly and time consuming.
- Availability, cost, and quality of seasonal labor.
- Finances. Capital investments needed to succeed or diversify product – business model.
- Food safety a concern as microbes change.

Major Themes – Strengths and Opportunities

- Available Department of Agriculture funds for farmers' markets and direct market sales.
- Eastern CT a good place to be located due to proximity to 45,000,000 people. Great opportunities for agriculture. Old warehouses available for indoor urban farming. Quality water.
- Agro-tourism as an alternative to Farmers' Markets. Bring people to the farm.
- Cost saving opportunities with new technology (e.g. greenhouse monitoring systems, new and more efficient vehicles and systems for spreading manure and fertilizer).
- SECT a great place to do business. UCONN School of Agriculture is an asset.

Tourism

Ed Dombroskas and Rita Rivera of the Eastern Regional Tourism District/Mystic Country facilitated the discussion. There were 19 passionate attendees representing many subsets of the tourism industry. Senator Paul Formica was also in attendance.

Major Themes: Challenges

- Lack of technology to effectively market the assets/attractions in the region – especially the smaller attractions/businesses.
- Need real leadership for tourism (not DECD) with meaningful budget.
- Lacking necessary data (stats) on the impact or contribution of tourism on (to) the economy.
- Lack of transportation/shuttles to get groups who come for business out into the region to explore. I-95 and transportation woes in general.
- We are in "brand limbo" – have lost our sense of place.
- Hotel taxes not used for tourism promotion. Tax money hijacked by Hartford.
- "CT is 300 years of uninterrupted non-progress." Distrust in the State. Shrinking budgets.

Major Themes - Opportunities

- Create a centralized APP – utilize technology to market sites. Grow the number of visitors.
- Regional branding effort to tie all the assets together – one regional – consistent- message applicable to diverse audiences – stay on the message. Create a strong sense of place – one that is distinctive.
- Market to the millennials – the next market. Shift the marketing model toward "Authentic Branding" model. Also need to market to local residents so that they may share knowledge with family and friends who visit.
- Create an ongoing forum – or opportunities for people in tourism industry to meet and discuss issues. "Urban Workshop."
- Opportunities for many diverse types of attractions – not always good to paint an area with one brush. SECT is many things.
- Change the way we do business – fund tourism locally (by region) – not through centralized office of tourism.
- Hospitality training to increase skilled workforce.
- Increase public safety – real or perceived.
- Casinos attract many to the region which has a potential advantage for all other attractions. Again – need to market the region as a whole.
- Re-open State operated visitor centers. People do stop and look for information about area attractions.

Utilities

Six people attended the discussion on the utility infrastructure in the region with resilience and competitiveness in mind. Representatives from area utility companies were invited to participate but not all were able to attend the discussion. They were invited to provide comments to supplement the input gathered at this focus group.

Major Themes – Strengths

- Unique to have an area so rural yet so connected with so much infrastructure. Several local utility companies advantageous.
- Strong utility infrastructure and sensitivity to evolving customer needs. Great collaborative efforts between local utilities and strong investments being made in SECT.
- Disaster preparedness is exemplary in CT vs other states. Past storms and trend toward more extreme weather has prompted resiliency and disaster preparedness work across all utilities.
- Resiliency programs resulted in reduction in number and duration of outages. Ongoing monitoring and systems upgrades.

Broadband – Fiber Networks

Strengths/Opportunities:

- SECT competitive with respect to BB capacity in the State (Several companies operating within the SECT Region), CT is one of the top states in US with respect to fiber network/capacity. Good competition for service in SECT. Can have multiple carriers for redundancy purposes.
- Consider ways to increase wireless capability – such as micro-cell development. Install "wireless cells" on streetlamps.

Weaknesses/Threats:

- Need more flexibility at the town level to utilize less expensive means of installing infrastructure (e.g. "micro-trenching") to increase the number of feet installed per day and to facilitate faster expansion of service to rural areas.

Water

Strengths/Opportunities:

- Several examples of coordinated connected water systems throughout the region (e.g. Groton and Ledyard, Waterford, New London and East Lyme)
- Possibilities to increase the water supply to Windham and Preston.
- Excellent water volume and quality in SECT.

Weaknesses/Threats:

- Extreme weather and drought both big concerns.
- Old infrastructure in the ground with only a "repair plan" and no "replacement plan" in place.
- New state requirements (relating to taxes) making costly upgrades necessary.
- Utilities pay high legal and lobbying fees to protect companies from increased legislation. CT a highly regulated state.
- Water supply system easily accessible increasing vulnerability to terrorism.

Electric - Gas

Strengths/Opportunities:

- Unique to have an area so rural yet so connected with so much infrastructure.
- Gas line expansion has greatly increased supply (E-lateral line)
- Regional Planning Study underway identifying the need for upgrades

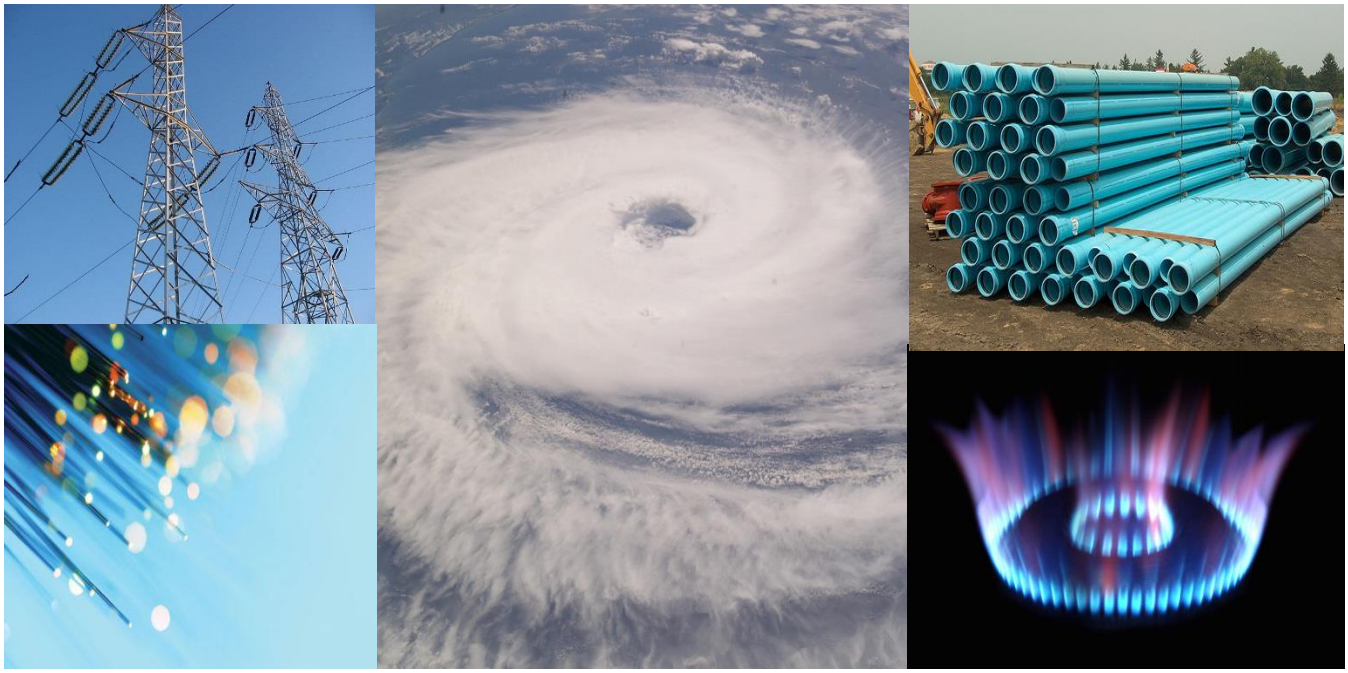
Weaknesses/Threats:

- Long cycle for transmission upgrades.
- Wholesale energy cost is much higher in SECT. Cost and reliability are important factors for customers. Demand for fast, cheap and reliable service NOW.

- The cost of construction (infrastructure) is high – not the cost of the utilities themselves. State does not help with the cost
- No flexibility and not enough lead-time for projects (to comply with state initiatives, or budget for upgrade).
- Disconnect between state and local plans.

General Comments:

- Big disconnect between state and local plans which affects project timeframe for completion, cost etc. The bigger issue here is that the permitting/installation/inspection process can be done faster in other states – making CT less desirable in this respect. Local knowledge needs to influence state plans with respect to underlying logic and timeframes.
- State has their own rules – they are not accountable to a timeframe; processes are inflexible and lengthy. Interest rates, construction costs and the overall market conditions could actually change during the permitting process!
- State regulations with respect to utilities often have a high cost associated with them which is passed on to the customer.
- SECT not marketing ourselves well. There is lots to do here – a lot of good energy!
- State regulatory process a barrier to new, and expansion of existing businesses.
- Gridlock on I-95 a huge deterrent to economic development in the area.



Participants in SWOT and Focus Group Events

(Does not include participants of the SCCOG Regional Plan of Conservation and Development SWOT)

Abby Piersall	Town of Waterford, Planning Director
Al Valente	Groton Business Association/ACI Merchant Systems
Alejandro Melendez-Cooper	Executive Director, Hispanic Alliance
Alicia Mcavay	Fresh New London
Allyn Brown Iii	Maple Lane Farms/ Norwich Beverage - Preston/Norwich
Amanda Ljubicic	Mitchell College
Ana Gonzales	Three Rivers Community College
Andre Trudelle	Grant Writer Town of Sprague
Andy Wood	Mystic Aquarium
Angelo Lluberes	CT Department of Transportation
Ann Scheibner	St. Francis House/SPARK
Annie Chambers	Southeastern CT Enterprise Region
Barbara Crouch	The Hygienic
Barbara Goodrich	City of Groton, Planning Director
Barry Pallanck	Connecticut Airport Authority
Bergin O'malley	Town of Stonington
Beth Tillman	FireFly Farms, North Stonington
Beth Hogan	Town of East Lyme, Board of Finance and Board of Selectmen
Bill Cornish	New London, Business Owner
Bill Gash	Executive Director at Connecticut Maritime Coalition, Inc.
Bill Sheehan	Town of Waterford, Board of Finance/seCTer BOD
Bill Smith	Greater Mystic Area Chamber of Commerce/ Groton Business Association
Bill Steinberg	TVCConnect
Bill Stover	Director of Family & Community Partnerships, Windham Public Schools
Bing Bartick	Town of North Stonington, Economic Development Commission
Bob Congdon	Town of Preston, 1st Selectman
Bob Hayward	Mashantucket Pequot Tribal Nation
Bob Mills	Norwich Community Development Corporation, seCTer BOD
Bonnie Nault	Shutters & Sails Real Estate on the Sound/ Town of Groton
Brad Sheridan	Entrepreneur
Bradford W. Currier Ii	Bradford and Co., Realtor
Brett Mastroianni	Town of North Stonington, Economic Development Commission
Bruce Miner	Mohegan Sun Casino
Bryan Chesebrough	Stonington Resident
Bud Mcallister	Partners in Health Communities
Camille Taylor	Taylor Realty Group
Carl Holte	Town of Sprague, Economic Development Commission
Carlee Drummer	President, Quinebaug Valley Community College
Mark Carlino	CTDOT Bureau of Planning
Carly Myers	Milone and MacBroom
Carol Kruse	Niantic Main Street
Cary White	The Nature Conservancy
Catherine L Young	Business Development, Connecticut Airport Authority/ Town of Groton, EDC

Chad Renshaw	Town of Bozrah, Director of Operations
Charles Hanley	Atlantic Broadband
Charles Maric	UCONN
Charles Rennick	P&W Railroad
Charlie Chase	Norwich Arts Center
Cheryl Auerbach	City of Groton, Economic Development Commission
Cheryl Molina	Psychotherapist, Waterford
Chris Pianta	AgroSci - Colchester
Christelle Lachapelle	SPARK Makerspace
Christopher Larose	Norwich Public Utilities
Christopher Jewell	Collins and Jewell - Bozrah
Christopher Regan	Regan Enterprises, LLC
Cindy Morrison	Groton Senior Center
Conrad Heede	City of Groton, City Council
Patrick Daley	Chief, Norwich Police Department
Danielle Chesebrough	Town of Stonington, Economic Development Commission
Dave Hammond	Town of Stonington, Economic Development Commission, seCTer Board
Dave Labrie	Inn at Harbor Hill Marina
David Boyle	Town of Stonington
David Brown	Groton Business Association
David Howes	ISAAC School
David Mieczynski	National Realty Advisors LLC
David Noble	School of Business, UCONN
David Paige	Preston - Emergency Services
David Preka	Town of Groton/Advanced Improvements
David Rathbun	Town of Stonington, PZC
Deb Mathiasen	SE CT Cultural Coalition
Diane Holmberg	Holmberg Orchards
Diane Nadeau	President, Greater Windham Chamber of Commerce
Donna Skaats	Attorney - Bozrah
Dottie Nauer	New London Resident
Douglas Low	New England Central Rail
Dr. Mary Ellen Jukoski	Three Rivers Community College
Dudley Molina	E Path Learning
Elaine Boissevain	Town of North Stonington, Planning and Zoning Commission
Elaine Stattler	City of New London, City Council
Ellen Parent	Program Director, Northeast Alliance
Eva Csejtey	Director of Volunteer Engagement, Access Agency
Felicia Stevens	TDP Arts Studio
Frank Mclaughlin	Assistant Executive Director, Renaissance City Development Agency
Frank Rogers	P&W Railroad
Gabe Stern	CT Municipal Electric Energy Cooperative
Gardner Young	Town of Stonington
Gary Evans	Director of Community Development, City of Norwich
Gary Goeschel	Planning Director, East Lyme/seCTer Board of Directors
Gary Mckeon	Joshua's Limousine
George Hernandez	Grow Windham
George Ryan	SPARK Makerspace

George Sprecace	City of New London, Economic Development Commission
Glenn Carberry	TCORS
Glenn Pianka	Town of Bozrah, 1st Selectman
Chris Guzzi	Providence and Worcester Railroad Company
Hal Zod	Hal Zod, AIA
Hanah Gant	SPARK Makerspace
Harold Hopkins	Director, Windham Materials
Heather Harris	Hyatt Mystic
Heather Somers	State Commission on Economic Competitiveness
Holly Cheeseman	Children's Art Museum of SECT
Jacob Orenstein	Nature's Art Village
James Finger	Planning Director, Town of Windham
James Ford	Town of Colchester, Economic Development Commission
Janet Clancy	Town of Preston, Board of Education
Janet Farquhar	New London Early College Opportunity Director
Jason Vincent	Town of Stonington, Planning Director
Jean De Smet	Windham Energy Commission
Jean Walsh	Town of Colchester Economic Development Commission
Jeanne Kurasz	Norwich Public Utilities
Jesse Wenzel	Eastern Savings Bank
Jill Rusk	City of Groton, City Council
Jim Bell	Preston Riverwalk Agency - Preston
Jim Bellano	Director of Economic Development Town of Windham
Jim Butler	Executive Director, SCCOG/New London Resident
Jim Smith	Town of Lebanon, Economic Development Commission
Jim Toner	Atlantic Broadband
Jim Turner	President, Willimantic Whitewater Partnership
Joan Racicot	Preston Resident
John Harrold	Retired Freeport
John Jensen	Pequot Commercial, Realtor
John Johnson	Thames River Properties
John Olsen	Sound Mind Designs, North Stonington
John Protz	Town of Montville, Economic Development Commission
John Scott	State Representative, 40th District
Jon Foster	CT Department of Transportation
Jon Froncak	Mohegan Sun Casino
Jon Vrabel	Enterprise Holdings
Jonathan Reiner	Town of Groton, Planning Director
Jonathan Rodgers	Entrepreneur
Joseph Miller	Curtain Livery/Yellow Cab
Joyce Resnikoff	Olde Mystick Village
Julie Soto	Town of Voluntown, Economic Development Commission
Juliet Hodge	Director of Economic Development, Southeastern CT Enterprise Region
Kate Rattan	Southeastern CT Council of Governments
Kathleen Amrein	Thames Yacht Club
Kathleen Smith	Town of Lebanon, Planning and Zoning Commission
Kathy Lacombe	Norwich Community Development Corporation
Kathy Rocha	Entrepreneurship and Innovation Consortium, UCONN

Kayla Hedman	Miranda Creative
Keith Hedrick	City of Groton, Deputy Mayor
Keith Laporte	Town of Lebanon, Planning and Zoning Commission
Kenneth Bondi	Bondi Commercial Real Estate
Kerry O'keefe	Slater Museum - Norwich
Kimberly Silcox	Center for Community Engagement, Eastern CT State University
Kimberly Simone	Foxwoods Resort Casino
Kristin Hartnett	Greater Mystic Chamber of Commerce
Larry Kucharski	Enterprise
Lian Obrey	Remax Real Home Team/ Groton
Liisa Lang	Spark Makerspace /Electric Boat
Lilli Rhodes	Director of Development, Community Foundation of ECT
Linda Phillips	Nature's Art Village
Linda Riquier	Business Services Representative, Quinebaug Valley Community College
Lisa Hastings	UCONN, Avery Point
Lisa Konicki	Ocean Community Chamber
Lori Potter	Mashantucket Pequot Tribal Nation
Lori Robishaw	LaGrua Center
Lou Steinbrecher	Town of North Stonington, Planning and Zoning Commission
Luann Dinihanian	Eversource
Lynwood Crary	Town of Preston, Board of Selectmen
Marian Galbraith	City of Groton, Mayor
Mark Berry	Town of Groton, Director of Parks and Recreation
Mark Nickerson	East Lyme, First Selectman
Mark Oefinger	Town of Groton, Town Manager
Mark Roberts	1st Venture Partners
Mark Schultz	US Naval Submarine Base
Martin Olsen	New London
Mary Ann Ricker	Town of North Stonington, Affordable Housing Committee
Mary Oliver	Windham Arts
Matt Beaudoin	Mystic Knotwork
Matthew Vertefeuille	Town of Windham, Zoning Official
Maureen Crowley	Director of Planning, East Conn
Merrill Gerber	Preston Riverwalk Agency- Preston
Michael Carroll	SEAT Transit
Michael Kaiser	Norwich Technical High School
Michael Kmec	Connecticut College
Michael Nauer	New London
Michael Sinko	Town of Preston, Board of Selectman
Michelle Kallen	Electric Boat
Migdalia Salas	MS17 Art Project, Hispanic Alliance
Joseph Miller	Curtain Livery/Yellow Cab
Mose Berymon	Bootlegger's Media/Mosmusik
Nancy Cowser	UCFS/ Montville
Neal Beets	Town of Windham, Town Manager
Ned Connell	Southeastern CT Council of Governments
Ned Hammond	City of New London, Director of Economic Development
Neftali Soto	Town of Voluntown, EDC /Waterford Public Works

Neida Rosado	Windham Resident
Paige Bronk	Town of Groton, Community and Economic Development Manager
Pamela Devivo	Town of Windham, Economic Development Commission
Pat Glynn	Southeastern CT Enterprise Region
Patricia Feeney	Ella T. Grasso Southeastern Technical High School
Paul Robillard	Town of Salem, Economic Development Commission
Penny Parsekian	Thames River Heritage Park
Penny Parsekian	Thames River Heritage Park
Peter Davis	Executive Director, Renaissance City Development Agency
Peter Debiasi	CEO, Access Agency
Peter Gardner	Deiter and Gardner
Peter Legnos	LBI / Town of Groton, Economic Development Commission
Phil Chester	Planning Director, Town of Lebanon
Phyllis Nelson	Town of Sprague, Economic Development Commission
Sgt. Darren Powers	Norwich Police Department
Reginald Preston	U.S. Navy
Ricard Matters	First Selectman, Town of Franklin
Richard Holmberg	Holmberg Orchards
Richard Lacombe	Town of Waterford, Economic Development Commission
Richard Waterman	East Lyme Puppetry Project Inc.
Rick Nassiff	Keller Williams Realty
Rita Rivera	Mystic Country
Robert Horrocks	Town of Windham, Economic Development Commission
Robert Lang	William Raveis Real Estate
Robert Vogel	SECONN
Robert Webb	CEO & Director of Sales at Charter Oak Scanning
Robin Chesmer	Owner/Operator Graywall Farms
Robin Kerlin	Morningstar Meadows, North Stonington
Roy Kerlin	Morningstar Meadows, North Stonington
Ryan Blessing	Norwich Bulletin
Sam Eisenbeiser	Town of Groton, Economic Development Coordinator
Sarah Mckay	The Hygienic
Sean Nugent	Preston Riverwalk Agency, seCTer Board
Sharon Hansen	East Lyme, Democratic Town Committee
Shawn Johnston	Community Relations Specialist, Eversource
Shawn Murphy	Town of North Stonington, First Selectman
Stacy Ritchette	Columbia Air Services
Stan Mickus	Cross Sound Ferry
Stella Elbaum	Town of North Stonington, Realtor
Stephanie Barber	Informed Citizens of North Stonington
Stephanie Clark	Grow Windham
Stephen Olbrys Gencarella	Professor – Folklorist fir CT River Museum
Steve Finton	Enrollment Management & Workforce Development , TRCC
Steve Mackenzie	Ex. Director, Southeastern CT Enterprise Region
Susan Bailey	Groton Business Association
Suzanne Lane	Town of Stonington, Economic Development Commission
Suzanne Moore	S R M Realty

Sybil Tetteh	City of New London, Planner
Tammy Daugherty	City of New London, Office of Planning and Development
Theresa Broach	Writer's Block & Emerson Theater Collaborative
Tim Londregan	Londregan Commercial Real Estate Group
Timothy Bowles	Preston, Former Selectman
Todd Postler	Green Home Solutions - Norwich
Tom Kasprzak	Eversource
Tom Devivo	Windham Town Council
Tom Maziarz	CT Department of Transportation
Tom Zanarini	Town of North Stonington, Planner
Tricia Walsh	Greater Mystic Chamber of Commerce
Van Brown	FireFly Farms, North Stonington
Victor Filepp	SPARK Makerspace
Ward Smith	Town of Stonington, Planning and Zoning
Wendy Bury	SE CT Cultural Coalition
Wendy Mikolinski	Pharmacist, Salem
William Ricker	Town of North Stonington, Conservation Commission
William Hosley	Terra Firma, Cultural Resources Department
William Pieniadz	P&H Construction
Winifred Bellefleur	SPARK Makerspace
Zachary Tomblin	Frontier Communications

Appendix C

Southeastern Connecticut Regional Resilience Vision Master Report (Draft)

Coastal Resilience Program

The Nature Conservancy

Publication 17-05. New Haven, Connecticut.

White, C. and A.W. Whelchel (2017)

The Southeastern Connecticut Regional Resilience Vision and Guidebook

DRAFT

Regional Challenges Workshop – DRAFT Summary of Findings

Water

Top challenges:

- **The impacts of nonpoint source pollution on the health of the region's surface and ground water.** Nonpoint sources of pollution as defined under the Clean Water Act are those sources that do not originate from a single location. These include runoff from human-made impervious surfaces such as roads, parking lots, rooftops. As this water enters lakes, rivers, oceans, and wetlands certain chemicals that are picked up can poison organisms or lead to algal blooms that destabilize ecosystems. Current climate change scenarios predict an increase in volume and intensity of precipitation in the Northeast. Without further actions to reduce nonpoint source pollutions, this issues will only continue to intensify in the region.
- **Aging and outdated stormwater systems are more easily overburdened by intense rainfall and the effects of sea level rise.** Reducing flooding in populated areas and along transportation corridors requires pipes, culverts, drainage ditches, infiltration basins, outfalls, and a number of other systems designed to move water away from natural landscape depressions. All of these infrastructural components require routine maintenance in order to function properly. Often municipalities fail or are unable to prioritize these activities in their budgets, which leads to increased flood risk in these communities. These challenges are exacerbated by the fact that this infrastructure was often not engineered to a standard that can meet the demands of a changing climate. The overall capacity of these systems cannot handle the short, intense rainfall events that the region will likely face, and as sea level continues to rise, these systems lose the hydraulic head required to convey stormwater away from developed areas. In some cases, this infrastructure may work against itself, sending ocean water back up the pipes and flooding developed areas from the drains. In addition to challenges facing the engineered stormwater infrastructure, landscape features such as forests and wetlands have always played a critical role in reducing downstream flooding. However, as development increases, the ability of this "green" infrastructure to perform its past function becomes compromised.
- **Important infrastructure vulnerable to storm surge:** The high pressure at the edge of a hurricane system creates abnormally high sea levels referred to as the "storm surge." This can often lead to flooding much further inland than communities generally experience. Much of the coastal transportation and wastewater treatment infrastructure is vulnerable to physical damage from hurricane storm surge. Such damage has the ability to cut off emergency access, cripple the region's economy, and jeopardize the habitability of some neighborhoods and villages. In addition to flooding, the force of high energy waves hitting buildings and infrastructure can cause significant structural damage. These threats are magnified when structures

are placed in close proximity to the ocean or when coastal erosion and/or sea level rise bring the shoreline closer to existing structures.

- **Rising sea levels intruding into aquifers and septic systems:** As sea level rises salt water will enter into water that was previously fresh. These changes could also contaminate of drinking wells and compromise home septic systems. For communities that do not have access to public drinking water, well contamination could render some coastal neighborhoods unlivable without significant infrastructure investments. If rising water infiltrates septic systems, this could cause these systems to fail and leach contaminated water into water bodies, aquifers, and downstream ecosystems.
- **Lack of clear policies in place to handle water shortages:** Water availability for communities is influenced by a number of factors including precipitation, population size, infrastructural capacity, the absence of water contamination, and the requirements of regional industries, agriculture, and ecosystems. Additionally, in periods of drought farmers may need to increase irrigation, which could exacerbate existing shortages in other parts of the region. While southeastern Connecticut has not faced any region-wide shortages in recent memory, the uncertainty around climate change and future population pressures could pose a threat to this surplus. The drought of the last few years has noticeably lowered a few individual reservoirs in Norwich, Stonington, and Niantic. Possibly because water shortages have not hurt the region in the past, there is no clear plan in place to handle this if the event arises. Lack of awareness in communities around this issue could hinder investments in more infrastructure and prevent more efficient water distribution in the future should rationing be required.
- **Homeowners most vulnerable to coastal storms impacts are often some of the town's highest tax payers.** Development in many coastal neighborhoods often requires private funds to support the necessary roads, utilities, and flood protection infrastructure. As a result, many of these coastal areas were settled over the past century by some of the wealthiest residents, who are among the top tax payers in some municipalities. This means that many municipalities are reliant on these coastal communities as major sources of revenue. The increasing flood insurance rates, storm threats, and sea level rise compound the vulnerability for municipal budgets if these residents move out of the region en mass.

Other challenges discussed in the workshop include:

- Brokering water sharing deals between municipalities and service areas
- Apathy among regional residents towards water quality issues
- Insufficient wastewater and drinking water infrastructure for when coastal residents evacuate further inland.
- Insufficient septic system capacity in some areas to handle the growing trend from seasonal to year-round residents in some areas.

- Environmental impacts of drought on lobster populations and the timing and distribution of fish populations.
- Conflicts in some coastal communities between the need to raise homes for flood insurance purposes and height restrictions in building code.
- Beach closures from water contamination
- Limited water backup supplies in case of drought
- Increasing temperatures in Long Island Sound are decreasing the ability for Millstone to cool its reactors, which may eventually lead to the plant permanently shutting down.

Food

The regional food system is deeply tied with producers and consumers outside of the region. This allows a greater abundance of food to reach local consumers throughout the year; however, it also means that the region is more vulnerable to disruptions in external food production and distribution. As fossil fuel costs increase and heightened climate hazards threaten to disrupt production and distribution networks, it is critical that the region maintain a firm foundation in local food production. Also, because inadequate nutrition can have a severe impact on worker performance, there is an economic incentive to ensure that healthy food can be available to all members of society.

Like many post-agricultural regions of the US, the food system of southeastern Connecticut lacks some of the cohesive management and oversight that other systems such as water and energy might. While there is a resurgence of interest in farming and local food, there appears to be a shortage of infrastructure to support these farmers and their business operations.

In building towards a more resilient and just food system, workshop participants identified five top challenges:

- **Regulatory hurdles faced by producers:** New farmers often find that one of their largest challenges is navigating the regulatory hurdles from multiple state and local agencies to get their product to market. These regulations include those that come from The Department of Agriculture, the Department of Public Health, consumer protection groups, local health districts, and farmers' markets. These regulations are largely intended to keep consumers safe, prevent harm to local ecosystems, and maintain the particular aesthetic character of a community. Additionally, farmers may run into limitations from local zoning ordinances on what they can grow. New farmers often lack the time or resources to navigate these regulatory processes and, in some cases, regulations have not yet caught up to innovative business models and agricultural practices. This creates a significant barrier to increasing local food production.
- **Limited infrastructure for producers and distributors:** Many local farmers feel limited in what they can produce by a lack of nearby processing facilities. In particular, there is no meat processing facility in southeastern Connecticut, and

some farmers choose to go to cheaper facilities in Rhode Island. These increases in transportation costs for farmers are a significant burden. However, setting up a meat processing a facility is very complex legal endeavor from a public health and environmental standpoint. In addition, these facilities often require large amounts of natural gas, which is in short supply in the region. Smaller-scale farmers also face difficulty distributing their final product as many farms are located outside of the more densely developed consumer hubs and there is no centralized facility to store local food products in bulk.

- **Competition for farmland with other, more profitable land-uses:** While local food production is clearly valuable for regional resilience, this value does not always translate into revenue for local farmers. Residential developments or solar farms can bring in significantly more tax revenue for a town than keeping the land in agricultural use. Therefore, the economic incentives often encourage municipalities to convert previously zoned farmland into other land-uses. In this way, regional governance can reduce the total amount of farmable land.
- **Food deserts in Groton and Norwich:** While the region as a whole may currently have enough food supply from local and non-local sources to meet the demands of its population, there are a few areas where lack of vehicle access prevents residents from accessing this supply. According to the USDA's Food Access Research Atlas, these food deserts are located in the Fort Trumbull neighborhood of New London, the City of Groton, the Town of Groton surrounding the US Naval Base, and downtown Norwich.
- **Environmental threats to agriculture:** The on-the-ground viability of local agriculture is also undermined by human- and naturally induced changes in the environment. Currently, lawn chemicals and road runoff into waterways has a detrimental effect on aquaculture operations. Lobsters in particular are declining due to warming temperatures and hypoxia. Observers document nationally collapsing bee populations—a trend that poses a serious risk to the viability of most of our plant-based crops. Additionally, the general unpredictability of future hardiness zones, frosts, and precipitation patterns makes planning very difficult for farmers today.

Other challenges to a more resilient and just food system include:

- Incentivizing farmers to sell products to schools and hospitals where they may get a lower return than farmers markets.
- Limited funding opportunities for new farmers
- Resistance in communities to more flexible uses of farmland such as breweries and agro-tourism
- State testing of waterways after rain events is not always timely which can lead shellfish beds closures that last a day or two longer than necessary.
- Channel dredging can cause siltation that smothers shellfish beds
- Future drought conditions threaten on farm water availability

- For some lower-income residents, the only access to protein is through fishing. As fish stocks are depleted through overfishing and invasive species in Long Island Sound, these residents lose this important part of their diet.
- Power outages could affect the ability for recipients of subsidized groceries to access this system.
- Disconnect between a need for reliable help from farmers and lack of access to transportation by employable residents
- Few training opportunities for on-farm jobs
- With little interest in farming from younger generations, many older farmers have no succession plans, which increases the likelihood of farms being zoning away from agricultural use.
- Increase in invasive species and parasites in Long Island Sound
- Meeting the demands of changing demographics and cultures in the region
- Farming today often requires investments in high cost technology
- Volunteer planning and zoning commissions can be pressured by large farms and agri business into making environmental unsound decisions.
- Inconsistent zoning between towns for uses accessory to farming (e.g. farm store, winery, petting zoo, brewery).
- Effects of power outage on local seafood storage

Ecosystems

The ecosystem services in southeastern Connecticut help to provide the clean air and water, healthy soils, flood control, and wind protection for the region's towns and cities. For participants the prime concerns in this regard was flood control and clean water. With Hurricane Irene and Superstorm Sandy still fresh in people's consciousness, communities have a strong interest in finding alternative, ecosystem-based ways of protecting coastal peoples and properties.

Additionally, many participants expressed concern about the water quality. As a culture that historically derived much of its wealth from fishing, many residents retain a strong connection to the water. The degradation of the region's estuaries and of Long Island Sound poses a significant challenges and reduces many potential opportunities for economic growth.

Top Challenges

- **Impacts of changing water quality and quantity on ecosystems:** Even in a water rich area such as southeastern Connecticut, human communities continually make decisions about how water is allocated between their own uses and the needs of the ecosystems around them. By damming reservoirs, communities take water away from downstream rivers and floodplains. In constructing more efficient storm sewers, communities are helping to transport water faster to local water bodies but at the risk of carrying warmed, over-nutrified, and potentially toxic water that wetland ecosystems would naturally filter out. I-95, Amtrak, and Groton-New

London Airport are all major vectors of nonpoint source water contamination located adjacent to important ecosystems such as tidal wetlands. As sea level rises, the region may begin to face water quality challenges that we have not in the past. These include the inundation of septic tanks which can leach large amounts of nitrogen into waterways and lead to hypoxia.

- **Loss of or alteration in ecosystem services:** Even where open space is preserved, environmental and human impacts reduce the ability of ecosystems to provide the same services they have in the past. As sea level rise erodes coastal ecosystems, these natural buffers such as salt marshes and eelgrass beds lose their ability to protect communities from storm waves and erosion. Land use decisions can also have large effects on ecosystem services. For instance, cutting down forests for development can lead to increased downstream flooding. Other times, a lack of active management by humans can reduce ecosystem function. As salt marshes migrate inland, landowners and land managers must take care to ensure that the site hydrology does not end up over inundating certain areas or that invasive species do not outcompete a more resilient native plant community. The decisions to reserve land for salt marsh migration is not always taken into account when planning. However, the benefits derived from these ecosystem services can often be difficult to quantify, making decisions to protect them sometimes difficult to sell.
- **Lack of smart, balanced, and resilient built environment:** Early European settlers in the region planned and constructed their towns for easy access to water ways for transportation, trade, fishing, hydro power, and later tourism. As a result, many of the communities in the region are built in floodplains and on top of historic wetlands. This both puts today's built environment at greater risk of flooding and compromises the ability of wetland soils and vegetation to purify water entering the region's waterbodies. The physical and chemical balance of ecosystem suffers when the built environment is not planned around these processes.

Other challenges facing ecosystems services as identified in the workshop include:

- Limited amount and distribution of natural resources and ecosystem services/benefits currently in the region. Further impacts from natural disasters, climate change, and/or further development would reduce the amount and distribution of this natural asset even further. The challenge becomes to retain as much of the existing ecological services/benefits as possible.
- Current development rarely factors in the complete suite of services and benefits provided to communities in the region by ecosystems and natural infrastructure. The need becomes rectifying the lack of ecosystem integration in existing development and instituting measure in future development. Currently, there are limited attempts to do so.
- Concerns about immediate and longer term impact on natural resources from sea level rise – particularly all tidally influenced wetlands.

- Future upgrades or additions to transportation infrastructure and systems (rail, roads, ports, and ferries) may impact existing ecosystem services/benefits if these considerations are not integrated.
- Impacts from storm surge on shoreline stabilization
- Balancing using ecosystems for recreation and public access with protecting ecosystem function and habitat corridors.
- Legal challenges as salt marshes advance inland. These include drainage/runoff regulations, post-flood redevelopment, and flooding of private and public assets.
- Challenges to current cooperative water sharing agreements between CT and RI posed by drought
- Limited stormwater treatment capacity which is exacerbated by rising sea levels
- Tourism attraction and quality of life in region decreases with degradation of natural resources.
- Lack of conversation around water conservation and how to allocate resources between natural, agricultural, and developed areas.
- Threats of water pollution caused by many wastewater treatments being in low-lying areas
- Limited awareness and educational opportunities within communities with regards to ecosystem services.
- Plants and animal species migrating into the region from the south are and may further disrupt local ecosystems
- Too little information and too much "indigestible" data.

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During the solutions workshop, participants elaborated on some of these challenges when bringing up the multi-generational nature of coastal properties in the region and long-term connections with the land. This connection while providing strength of community amongst residents in some cases presents a challenge to thinking progressively about how parcels will change in the future and how natural resources can be used to reduce risk. The multi-generation connections and approaches ("this is the way we have always done it") may limit the use of ecosystem services without education as to alternatives.

Transportation

Top Challenges:

- **Flood vulnerability to New London transportation center:** Downtown New London is home to a regional transportation hub for the Amtrak, regional trains and buses, and ferries with service to Long Island, Block Island, and Fishers Island. This center also boasts one of the state's three deepwater ports and is easily accessed from I-95 and the Groton-New London Airport. Due to its low-lying position, flood

models suggest that this transportation center could become inaccessible in a large storm. Photographs from the Hurricane of 1938 show significant flood damage in most of this area. Furthermore, the above ground electrical system that powers the trains is vulnerable to high winds and flying debris. Such a disruption in these transportation services could have far reaching consequences for not only southeastern Connecticut but for New England and the mid-Atlantic states.

- **Primary arterial roads are vulnerable to flooding, tree falls, and ice impacts:** While I-95 and I-395 are built to the standards of a 500-year storm, many of the main state roads in southeastern Connecticut such as Route 1 and Route 156 are vulnerable to the impacts of more common storms. These roads host a good deal of regional traffic and many serve as evacuation routes for shoreline communities. This vulnerability has implications for both regional economic activity and human safety.
- **Unreliable public transportation to emergency shelters and employment centers:** If roads become inaccessible for public bus service, residents who lack access to a car could become stranded in their homes. These issues are exacerbated as the elderly population of the region increases. Furthermore, even non-emergency disruptions in public transportation can prevent transit-dependent employees from reporting to work. This could lead to reduced economic output and to these employees losing their jobs.
- **Aging infrastructure:** The state department of transportation and many municipalities often lack adequate funding to maintain or even conduct safety assessments of roads, bridges, and other public infrastructure. In extreme weather conditions, this could pose a serious risk to residents and could put a damper on long-term economic and community recovery.
- **Conflict between use of Thames River Amtrak bridge and access to the Groton Submarine Base.** In the event of an emergency that required the Groton Submarine Base to have access to Long Island Sound, the moveable Amtrak bridge would be required to stay open. This could present significant challenges for not just southeastern Connecticut but all train travel along the Eastern Seaboard.

Other challenges to transportation:

- Underperforming communications technology that would warn residents of road closures, etc.
- Lack of plans to re-track freight trains and to utilize New London-Worcester line for evacuation in the case of an emergency.
- Difficulties coordinating natural hazard mitigation and emergency management plans across federal, state, and local entities.
- Access to gasoline could be cut off if access to the port of New Haven were compromised.
- Few safe transportation alternatives in emergency situations such as reliable bike and pedestrian infrastructure

- Long standing dispute over completion of Route 11 in Salem, which would serve as an additional evacuation route.
- Norwich Business Center is in Special Flood Hazard Area.
- Keeping bike lanes and sidewalks clear in the winter
- With limited access to ambulances, there would be difficultly for EMS to reach vulnerable populations and to evacuate large scale facilitates such as regional hospitals and nursing homes.

Energy

The list of activities that are reliant on the regional energy system is extensive. Without a reliable source of energy and an efficient means to distribute it, many businesses would shut down, community services would collapse, food would spoil, and residents would go cold in the winter. Clearly, a functioning energy system is vital to community resilience.

The top challenges facing energy production and distribution in the region include:

- **Insufficient preparedness and capacity to recover from flooding and high wind weather events:** While utility companies work hard to decrease the risk to the largest transmission lines, many municipalities struggle to protect local electrical lines from falling trees and other storm debris. Downed power lines can leave neighborhoods or whole villages without power for weeks. Often the responsibility for tree pruning falls on municipal offices that lack the resources to keep up with these tasks. To make matters more difficult, pruning that is perceived as being over-zealous can be met with community outcry. In addition to hazard mitigation measures, the region also lacks a large enough trained workforce that is capable of efficiently repairing electrical lines after a large storm. When a shortage of crews is required to respond to multiple downed lines, utility companies may be required to turn off large portions of the grid while crews move between sites. This can create confusion and frustration amongst energy consumers.
- **Communications disconnect between energy consumers and providers:** Observers in the region attribute some of the conflicts between energy consumers and providers to a lack of awareness amongst the energy consumers about everything that goes into providing them with energy. These conflicts arise in planning microgrids, implementing renewable technologies, and in rate hikes. While a decentralized and diverse energy system is theoretically more resilient than one with central distribution and a few energy sources, the cost to transition to these kinds of systems are quite high. “Micro-grids” require a significant investment in expertise, planning, and re-wiring to implement while the economics around alternative energy sources such as solar are still fraught with questions such as how home producers should contribute to maintaining the grid. Increasing energy rates to fund investments in new infrastructure may more often than not just lead to angry customers.

- **Uncertainty surrounding inner workings of energy grid:** For security reasons, energy utilities limit access to much of the regional data on energy import and export. This lack of information hinders the ability of municipalities and other organizations to prioritize and advocate for local investments in infrastructure such as solar production and micro-grid technology. In many instances, planners and decision-makers believe that such investments are critical to the economic and social resiliency of their communities. In addition to concerns surrounding the future of fossil fuel consumption, the communities of southeastern Connecticut face the possible decommissioning of a local nuclear power plant within the near future. Millstone Nuclear Power Plant currently produces nearly half of all of the power needs for the state of Connecticut, and the shutdown of this service could mean a sizeable hike in energy costs for regional consumers.

Other concerns and challenges related to the regional energy system identified in the workshop include:

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- Threat of damage to and meltdown of Millstone reactors
- Fluctuations in energy quality and stability across the regional grid
- Threat of terrorism to Millstone and to other components of the energy infrastructure
- Inability of low income families to select alternative energy sources, which may hinder larger scale economic transitions towards cleaner energy.
- Land use conflicts between large scale agriculture and the potential for large solar arrays
- Poor supply of natural gas in the region
- Under-developed storage technology for alternative energy production such as solar, wind, and tidal.

Economy

Top challenges

- **Short and long-term effects of flooding and power outages on business continuity:** For many small businesses, the loss of just a couple of weeks of revenue can lead to permanent closure. This loss of business can come from local transportation routes becoming compromised by flooding or snow. Also, storm-induced power outages can affect a business's ability to access financial information or perform transactions, and for those businesses that rely on refrigeration, even a few hours of lost power can spoil their entire inventory. According to the RESF7 report, few businesses in the region have plans in place to recover from such scenarios.

- **Serving lower income communities with food, transportation, and shelter in emergency situations.** Many residents of southeastern Connecticut are dependent on public transportation which can become cut off in the event of an emergency. This could prevent these communities from accessing food. If power goes down especially during the winter, these residents may need ways of finding warmer shelter. Importantly from an economic perspective, this lack of access to transportation may prevent employees from reporting to work. This could lead to reduced economic activity and to these workers losing their jobs.
- **Limited training in and testing of preparedness plans for municipalities and social service organizations:** Without proper consideration of emergency management and disaster mitigation, communities too often assume a reactive rather than proactive approach to natural hazards. Investments often pour in following a disaster and dry up during calmer periods. Some municipal and organization staff in the region note their discomfort with the seeming lack of any robust disaster training available to their municipalities and organizations.
- **Economic ripple effects:** "The economy is based on connections," noted one workshop participant. Therefore, damage to one part of the region can quickly compound upon itself. If downtown Mystic were to be critical damaged for instance, region-wide tourism could decline precipitously. The complexity of the economic system makes anticipating vulnerabilities and planning for disaster significantly more difficult than in other systems such as transportation and energy.
- **Vulnerability of tax base to storm damage and sea level rise:** Even in good times, municipalities can struggle to fully fund the services and programs necessary to sustain safe, healthy, and well-educated communities. Because municipalities receive their revenue from progressive property taxes, lack of funding can be a particular problem in communities with on average lower-income residents. Many coastal municipalities in Connecticut receive a significant amount of their revenue from contributions of waterfront homeowners. These residents tend to be wealthier than the rest of the population but are also more vulnerable to property damage from storms and sea level rise. This situation can create a cycle under which municipalities feel they need to invest more in infrastructure to these communities

Other challenges to the regional economy identified during the workshop include:

- Most major employers and top-paying residential taxpayers sit in coastal areas.
- A few of the region's major employers have multiple branches and could choose to relocate operations if they deemed their current position to be too vulnerable because of coastal exposure and infrastructure vulnerability.
- In addition to lower income communities, other significant regional demographics such as college students, the elderly, and those stuck in the New London transportation center may lack mobility during storms and prevent them from retreating to safety.

- Lack of certainty regarding how to compensate those who provide recovery assistance.
- Limited emergency response and hazard mitigation policy coordination at the federal, state, and local levels.
- Important seasonal industries such as recreation, fishing, and environmental tourism are particularly vulnerable to the effects of climate change and extreme weather.
- A large-scale power outage could prevent residents and businesses from accessing bank accounts, communication systems, and gasoline.
- Business discontinuity for local suppliers could lead buyers to look elsewhere for products.
- Water quality contamination could decrease opportunities for development in the region.
- The long term dislocation of residents could have profound economic impacts
- Limited coordination between the communities along the I-95 corridor. Few plans in place to coordinate evacuations across state lines.
- Heightened crime vulnerabilities during emergency situations if law enforcement is otherwise occupied.
- If supplies of important commodities are disruption such as oil, this could lead to a short term price spike that would hurt small businesses reliant on this commodity.
- Most employees need vehicles to reach their employers.
- General wage stagnation
- Economic impacts of Millstone decommissioning
- Limited business diversity in the region
- Economic impacts of increasing substance abuse, domestic violence, and mental health problems in the area.
- Many residents work outside of the region, fragmenting the social fabric of communities.
- Increased costs of health and social service following a traumatic event
- Decline in manufacturing
- Limited regional coordination
- Vulnerability of IT to cyber-terrorism
- Increasing population age
- Limited willingness or ability to invest in infrastructure improvements
- Local permitting processes can be a significant burden for new businesses

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Regional Solutions Workshop – DRAFT Summary of Findings

Water

- **Challenge: Planning for water shortages:**
  - The prime concern and focus during the solutions workshop was around private wells about which there is little available information. As a result, state regulators and municipal officials may be unable to anticipate water shortages or how much extra public capacity may be needed. A first step towards this kind of planning, therefore, may be an assessment of the location of all private wells in the region. Utilize existing Public Water Supply Mapping available on the CT DPH, Drinking Water Section's (DWS) website to help inventory areas with public water supplies versus private well water supplies.
  - Even without this kind of upfront assessment, there are actions that residents and businesses can take to more efficiently use drinking water. These include using non-potable water such as collected rainwater to flush toilets and irrigate lawns. These kinds of measures could be championed by municipalities, local health departments, and/or in schools.
  - A pipe was recently installed across the Thames to connect the Groton Reservoir with Lake Konomoc, which supplies New London, Waterford, and East Lyme. Additional connections could be installed to connect in with the Norwich water supply to balance out Groton's abundance. Two plans of note are currently looking at the state's water supply: The Water Resilience Plan and the State Water Plan.
- **Challenge: Assess current public and private water supply and distribution capacity:**
  - **Develop greater understanding of the current supply of water in the region between reservoirs and public and private wells to help make more information decisions about future development.** This information could also be helpful for other ongoing efforts aimed at addressing supply security, efficient use/reuse, and education to move towards greater water resiliency across the region.
- **Challenge: Nonpoint source pollution/saltwater intrusion into septic systems:**
  - To address pollution from impervious surface runoff, all participants seemed to generally support a range of broad-based actions. One strategy included using rain gardens and bioswales to infiltrate stormwater before it entered waterways. Done at a large enough scale, these interventions could also protect against downstream flooding.

  - Another strategy would be to require septic system inspection at point of sale.
  - Additionally, municipalities could continue to improve existing combined sewer systems to minimize the chance of pollution during a heavy rain event. Norwich in particular has a combined sewer system, which means that during large rain events a bypass may occur, diverting untreated raw sewage into regional waterways.
  - **Build upon past projects and foster future opportunities across the region to utilize green infrastructure and improve gray infrastructure to enhance capture and infiltration of runoff.** Nonpoint source pollution often requires changes across the entire stormwater management system to fully address. Green infrastructure projects such as bioswales and rain gardens prevent polluted waters from entering regional waterbodies and can serve as public amenities. Grey infrastructure such as pipes, swales, and culverts are also useful in transporting water to places where it can more easily be infiltrated. Where appropriate, planners could encourage cross-municipality storm sewer connections that more effectively operate at the watershed level.
  - Work towards the development of a long-term plan for upgrading identified infrastructure to prevent saltwater intrusion.
- **Challenge: Surge threats to infrastructure:**
  - One approach that participants took to reducing these threats was to reduce the need for that infrastructure in the first place by phasing homes and businesses out of areas serviced by that vulnerable infrastructure. At the planning level, municipalities can work to discourage development in these high risk areas. Also, one participant expressed a sentiment that municipalities weren't doing enough to enforce FEMA's regulations, which require properties that have been 50% destroyed in a storm to be demolished.
  - The conversation also looked at the combined effects of inland and coastal flooding as these are often difficult to tease apart. Participants suggested a cross-municipality planning effort to identify chokepoints in the stormwater management system (i.e. roads and properties that are repeatedly flooded). With this information in hand, the regional and municipal planning bodies could more easily identify watersheds to invest in for green infrastructure, permeable pavement, and grey infrastructure improvements. This type of planning could perhaps even be encouraged through state legislation.

Overarching Solutions Identified:

Develop a regionally specific decision support process to help municipalities assess and plan for flooding, efficient use/reuse, and nonpoint source pollutions, simultaneously: Effective water planning must be highly integrated across challenge areas in order to maximize the return on infrastructure investments and avoid contamination of between different water uses. A regionally specific planning template might include information such as the important waterbodies and water supplies that need protection and areas of particular concern for salt water intrusion. The decision support process could guide planners as to the priorities for water planning in the region and provide useful templates for conducting town-wide assessments.

- Funding is a major obstacle for these kinds of infrastructure projects. Therefore, all of these approaches should be paired with continued lobbying around water-related issues. The Clean Water Fund administered by DEEP provides financial aid to municipalities through grants and loans for planning, designing, and constructing water pollution control facilities. It is financed through a combination of federal funding, state general obligation bonds for the grant portion, and state revenue bonds for the loan portion.
- More efficient water use and reducing the load on stormwater infrastructure will always be net positive actions to reduce flooding and contamination of waterways. There are many ways this can be accomplished such as green infrastructure, rainwater re-use, and a general culture of water conservation amongst users.
- As many of the municipalities in the region face the same issues of flooding and nonpoint source pollution, participants suggested that an organization develop a regionally specific process or template for how towns can assess and plan around these issues.
- Focus outreach efforts in school classrooms. The Last Green Valley has an established curriculum that they run in local middle schools about the water cycle. Other concerned organizations and/or agencies could review this curriculum to see if there is room to expand it and perhaps provide support to run in more schools.
- Municipal natural hazard mitigation plans offer strong backing for municipalities to take action to protect areas from flooding.
- Outreach and education or implementation of water conservation measures which may include reducing outdoor water use and installation of low-flow water fixtures and energy-efficient water using appliances.

Food

- **Challenge: Limited processing and distribution infrastructure:**
  - **Explore cooperative funding, sourcing, and distribution models in order to meet growing demands for local foods among area residents, schools, and other institutions:** While single farmers may experience difficultly achieving the scale of production required to fulfill all of the demands of consumers in the region, groups of farmers may strategically join forces to access larger markets, distribution, and processing infrastructure, apply for larger sources of funding, and achieve higher economies of scale. As farmers notoriously have little time to devote off the farm, these initiatives could be mediated by a third party entity or sustained by consumer groups or larger regional institutions. The Food Hub Assessment conducted by the New London County Food Policy Council examines what a cooperative distribution system could look like in the region.
  - **Scope feasibility of large scale municipal composting:** Large scale composting can provide a benefit to farmers, area residents, and local businesses while reducing the burden on landfills and the environment. Many municipalities in the US already run large-scale composting. These operations could collect farm wastes, food scraps, and garden waste and turn over low-cost materials for landscapers and residents in region. Other forms of composting could also generate energy such as the system currently in place in Pittsfield, MA.
  - **Scope feasibility of regional processing facility:** The USDA already provides special funding for communities to develop processing facilities. This may be a first step for organizations and farmers to look into. In tandem, or as an alternative, a person or organization could conduct a study to identify opportunities for on-site processing that do not have excessive permitting costs associated with them. At what point, for instance, does the volume of a product require more permitting? Can farms still turn a profit by producing certain products at a smaller scale? Organizations and farmers could then brainstorm ways to make these opportunities commercially viable. For larger scale meat processing in particular, a lack of natural gas availability in the region is a major obstacle. Participants suggested that this may need to be considered in discussions to expand this kind of energy in the region.
  - **Scope feasibility of cooperative distribution system:** Organizations and farmers may also want to explore cooperative distribution models in order to meet growing demands for local foods among area residents, schools, and other institutions. CT Farm Fresh, a business located in East Haddam, currently provides sourcing and distribution and home delivery services for

a number of farms in the area. Finding ways to bolster and build upon this existing service could help to alleviate some of the distribution challenges facing local farmers.

- **Challenge: Regulatory hurdles faced by producers:**
  - **Look to streamline regulatory requirements across multiple state agencies:** An assessment of all regulatory requirements for farm operations may yield redundancies or processes that can be simplified. To encourage the growth of the food economy, this assessment may in particular look to reduce regulatory burden on new or established farm operations below certain size and/or output thresholds. Model ordinances at the municipal level for permitting and even incentivizing non-traditional agricultural practices (i.e., greenhouses) and non-farm uses (i.e., breweries) may also help foster small farms.
    - According to participants, one of the biggest challenges facing farmers from a regulatory standpoint occurs at the state level with multiple agencies requiring different permits, many of which include the same information. Looking for opportunities to streamline these regulations could make it easier for new farmers to establish themselves. Additionally, municipalities and public health departments could look for ways to streamline their permitting requirements with those at the state level. Participants discussed the problems with a "one-size-fits-all" approach to regulation where smaller farmers are penalized because of safety concerns that would apply to much larger operations. Participants suggested that regulations could identify size or output thresholds where certain regulations would come into effect.
    - One particular issue that farms face is permitting non-farm uses such as event spaces and breweries. These are generally regulated by municipal planning and zoning departments. Participants suggested that it may be helpful to create a model regional ordinance that towns can adopt. This would make it more clear to farmers across the region what they can expect to do on their farms. If municipalities can agree to expand the allowed on-farm uses, participants suggested that this could help make agriculture more attractive to the next generation of farmers.
    - In more urbanized parts of the region, participants felt that there were opportunities to capitalize on innovative new agricultural practices such as aquaponics and indoor growing. Perhaps zoning regulations could develop new ordinances to permit or even

incentivize these kinds of businesses. They could also take steps to encourage corner retail markets that would sell locally sourced food.

- **Challenge: Competition for farmland with more profitable land uses:**
    - **Create greater housing opportunities in currently developed areas and take steps to promote agricultural careers to the next generation:** While these strategies may seem disparate, these may be two concurrent strategies for alleviating conflicts over farmland by simultaneously making development of non-farmland more attractive and making farmland more valuable to keep in its current use.
        - Participants approached this challenge from a couple of directions. First, they believed steps should be taken to develop housing opportunities elsewhere in communities to take pressure off of developing farmland. Second, communities could take steps to make agricultural careers more attractive to the next generation of farmers.
        - Accessory apartments are converted garages or smaller dwellings that can be placed on single-family lots. In many cities and towns, provisions for these types of dwellings are used as a way to increase living density and reduce development pressure in other parts of the communities. Participants believe that these are an overlooked opportunity in southeastern Connecticut and could help prevent further the development of the region's farmland. Transfer of development rights are another planning tool in which landowners are prevented from building on a property that the municipality wants to conserve in return for the right to develop somewhere else in the community where they want to encourage development. Often this is carried out within a single community, however, participants brought up the idea of carrying this out between municipalities.
        - Often farmland is sold for development when farmers retire and do not have successors to continue their business. Participants suggested that by developing an internship and/or pipeline program for local youth, the region could create more demand from those who would want to continue using land for farming. Additionally, local retailers could take further steps to promote locally grown food, which would raise awareness of these issues and perhaps make local agriculture more profitable and attractive to young people as a career.
- **Challenge: Uncertain future environmental conditions:**
    - **Explore ways to accommodate the uncertainty of future environmental conditions:** Crop diversification, value-added products, and additional on-farm uses such as event spaces are all potential ways to buffer against the uncertainty farmers face when planning for changing environmental

variables such as temperatures, growing season length, and precipitation rates. Additionally, farming techniques focused soil health may also significantly increase the resilience of crops to disease and temperatures variability while more effectively absorbing precipitation.

- **Increased focus on reducing flood risk to farmers through dam removal, soil erosion control measures, and watershed management plans:** Looking on a regional scale, the success of agriculture is highly dependent on the management of soil and nutrients across the landscape. While seasonal flooding is an important fertilizer source for many agricultural systems throughout the world, the extensive damming and development that has taken place in New England's watersheds has disrupted these patterns and made the flooding much more catastrophic for farms located in floodplains. Additionally, modern farming practices that do not account for soil health often create conditions ripe for wind and water erosion. Planning for these various threats to soil health and sediment and nutrient flows may help to improve the productivity of agriculture region-wide.
    - At the farm level, participants suggested that certain practices could help to build the resilience of local agricultural businesses. These practices include the diversification of revenue streams through alternative crops, value-added products, and additional on-farm uses such as event spaces. Modern farming techniques such as indoor hydroponics and hoop houses give farmers greater control over the growing climate and can help reduce the vulnerability of farm production to climate change.
    - Another possible threat facing farmers is soil erosion caused by intense rainfall events. Farmers can take action to reduce this vulnerability by planting trees and other deep-rooted perennial crops. At a municipal planning level, stormwater management regulations can help to ensure that valuable farmland soil is not lost to erosion. This could be particularly important in urban areas that may want to promote outdoor urban farming on limited land.
    - At the regional scale, participants suggested that municipalities should continue to take steps to reduce flooding threats to farmers. This might occur through continued dam removal as recommended by natural hazard mitigation plans as well as watershed level flood management plans.

- **Challenge: Limited food access for some communities:**
    - **Conduct a food-shed mapping effort across the region to determine sources and quantities of locally produced food:** Food-shed mapping

assessments are a promising new way to determine the viability of regional food systems. This assessment could measure both current production as well as production potential in the region. This information can help municipalities and local organizations set regional production goals and prioritize where and how it wants to enhance opportunities for new farm businesses.

- Some participants believed that parking regulations imposed by municipalities were limiting the development of more supermarkets in places that needed better food access.

- **Other solutions:**
  - Participants felt that more year-round farmers' markets could help to increase access to healthy food. By encouraging more processing and preservation of local produce, perhaps through a farmer cooperative, more farmers would have a product to sell year round. This kind of processing could also take place in schools and help ensure that students had access to locally grown food in every season while supporting local farms year-round.
  - Schools could also teach more programs in cooking and meal planning, which may help families make better use of healthier options that are available.
  - Food production on municipal park land is another growing trend in municipal planning nation-wide. Participants expressed an interest in edible "food forests" in urban areas as an intriguing way to bring healthy food closer to those who need it most.

Ecosystems

- **Challenge: Reduction in coastal protection and water purification services:**
  - **Continued collaborative leadership that champions the benefits of ecosystem services from the municipal to regional scale:** There is great awareness and concern amongst the region's planners on the importance of appropriately valuing all of the benefits of ecosystem services for community resilience, economic growth, and environmental health. It may be important for municipalities to continue to champion these issues from within as a way to anchor regional projects and initiatives.
  - **Assess the services provided by natural assets with monetary values when making decisions within the context of economic growth and development across the region:** Most large and important decisions in the region are made with municipal finances in mind. However, the accounting that goes into these decisions does not always include the value of natural capital. While there are no universally standardized ways to value natural assets, planners can reference past studies of ecosystem value from elsewhere to estimate value of local natural spaces. Without the ability to

compare alternatives (i.e., ecological cost and economic return), natural assets will likely continue to be discounted or marginally considered.

- Participants agreed that approaches to addressing this challenge should happen across multiple scales. At the planning scale, local, regional, and state actors can proactively work to identify highly vulnerable areas for both the built environment and functionally important ecosystem. The rationale behind this is that in some cases certain ecosystems (notably coastal wetland) may be providing services that are as valuable if not more valuable than the cost of mitigation actions that can be taken for the built environment (i.e. levees, flood-proofing). As the climate continues to change, the loss of these services could make previously well protected areas more vulnerable. Additionally, areas that are currently built out, may have more value to the greater community going forward as restored ecosystems. Local land trusts can play an important role in ensuring that future growth does not jeopardize existing critical ecosystem function. The possible relocation of coastal transportation and other infrastructure may create some intriguing opportunities to restore ecosystem services at a large scale along the highly developed coastline. The most notable opportunity is the Amtrak line, which is currently being considered for relocation.
- At the local scale, municipalities can more strictly enforce and/or enact stricter standards for rebuilding in high hazard areas. This would help to ensure that there are fewer structures in harm's way long term while increasing the opportunities for coastal and riverine habitat types to persist and adapt. With more space to adapt to rising water levels and other changing conditions, ecosystems can increase their potential to enhance their services in the built environment.
- Municipalities, land trusts, and other landowners can also make use of "living shoreline" techniques where site conditions and impacts warrant. Living shorelines are adaptable natural features that can be used wherever flooding is an issue in both coastal and riverine environments. Living shorelines can be used to both slow the force of catastrophic waves and reduce more gradual, everyday erosion. In doing so, these strategies can help to increase the level and longevity of services provided in the region. Along more natural shorelines, landowners can also take important steps to maintain these existing ecosystem services and encourage the ecosystem to adapt to changes in climate such as increased precipitation, sea level rise, extreme heat, and drought.
- **Define ways to incorporate ecosystem services directly into permitting requirements for MS4 at the municipal level:** New MS4 stormwater permitting requires that municipalities reduce the amount of pollutants entering their waterways via storm sewers. A potential opportunity for addressing the issue of declining ecosystem services would be to find ways to

incorporate ecosystems services directly into the permitting requirements at the municipal level. There are many strategies municipalities can take to encourage replacing impervious cover with green infrastructure such as raingardens and bioswales. One example is to institute a stormwater fee where property owners must pay a small sum relative to the amount of impervious surface on their property.

- Finally, participants discussed the need to properly value the services provided by natural assets within the context of economic growth and development across the region. Without estimates of monetary value municipalities and developers will never be able to truly assess the pros and cons of building in certain areas. Participants noted that these estimates would not have to be especially rigorous to at least start a conversation. Some suggested using studies taken elsewhere on the value of ecosystem services to get ballpark numbers. Without the ability to compare planning strategies based on similar metrics (i.e. expected economic return), planners worry that natural assets will continue to be assigned a low economic value.

- **Challenge: Conflicts between built environment and ecosystem function:**
  - **Explore and catalogue financial mechanisms and incentives for property owners to maintain and enhance natural infrastructure and associated services:** There are a number of grants and tax incentives available to landowners for conservation and restoration. These sources are often dispersed amongst various foundations, agencies, and organizations and not readily accessible in one place. Without understanding these alternatives, landowners and developers often default to traditional engineering and site design practices. A common list of these opportunities that municipalities and organizations can share with landowners can help the region as a whole move towards greater integration of the built and natural environments.
  - **Integrate natural infrastructure into zoning codes to reduce conflicts between development and community resilience:** Zoning codes represent a high leverage point for encouraging the construction and protection of natural infrastructure in communities. Some possible ordinances include requirements of a minimum accepted volume of stormwater runoff from a site and progressive overlay districts that create a coastal development buffer that keeps up with sea level rise. Planning documents such as the Plan of Conservation and Development can also consider longer planning horizons that can better anticipate future environmental conditions.
  - **Conduct outreach and education for residents and business owners on where and what natural alternatives could be considered alongside standard hard engineering approaches to improve resilience:** Private landowners are not always aware of the financial benefits of natural and hybrid coastal engineering projects. As a result, there is still a small market

for these strategies. Municipalities and organizations may consider conducting an outreach campaign directed specifically at vulnerable landowners about these benefits.

- Conflicts between property protection and ecosystem services can be difficult to negotiate when coastal landowners have long-term and often multigenerational connections to their land. With this in mind, the participants suggested that initiatives focus in on areas slated for redevelopment and work to reshape how landowners think about their property either through financial or cultural means.
- Redevelopment of high risk areas and/or adjoining areas need to be exposed to and seek to incorporate the full suite of ecosystem services that are available at a site or could be created there. Participants also discussed the opportunity to take advantage of easements as a tool to minimize the footprint of development and redevelopment.
- By more fully accounting for the service costs associated with coastal and high risk riverine areas (roads, water infrastructure, emergency management, etc.), participants suggested that planners and developers would make better informed decisions about where and how to build. There is a need to explore and catalogue additional financial incentives for property owners to encourage the continued maintenance and enhancement of natural infrastructure and services. Perhaps there are ways to incentivize developers and landowners to more harmoniously integrate the built environment with ecosystem function.
- In order for residents, municipal officials, business owners, and other community leaders to consider the benefits of natural infrastructure and to use ecosystem services to improve resilience there must be greater awareness on the trade-offs of hard infrastructural applications such as seawalls. Participants suggested some form of outreach and education associated with these issues, where natural alternatives could be presented alongside standard hard engineering approaches where appropriate.
- Participants also brought up the idea of changing the cultural dialogue associated with the coastal lifestyle. The "coastal dream" is very individualistic and often does not fully consider the true cost to society and to the environment from living in high risk areas. Participants suggested that the conversation around coastal hazard mitigation could be guided from preventing flooding of the built environment to accommodating it through existing natural assets such as salt marshes and floodplain forests. Also, focusing the conversation around how ecosystem services improve public safety may help to elevate the importance of ecosystems for a broader audience.

- **Challenge: Effects of reduced water quantity and quality:**

- Participants believe that regional water conservation should be prioritized and that organizations should make an effort to communicate the economic impacts of reduced water quantity and quality from environmental degradation. Furthermore, there is a need to integrate the conversation, planning, and practices between water quantity and quality. Currently, this topic tends to be disconnected or not considered jointly in various ongoing planning initiatives.
- In addition to communication and education, participants also brought up the possibility of instituting mandatory conservation policies based on land use. For example, single family residential properties may only be allowed to use a certain amount of water per year.

Overarching Solutions Identified:

- **Collaborative leadership championing the benefits of ecosystem services from the municipal to regional scale will have positive effects across challenge areas.** Currently, awareness of the value of ecosystems ervices resides in and amongst various staff across the municipalities but is never amplified and made a core issue for the region.

Transportation

- **Challenge: Ageing infrastructure:**
  - All structures eventually deteriorate over time and therefore need consistent maintenance to ensure their continued operability. While most maintenance shortcomings can only be solved through additional funding and personnel, participants also drew attention to the opportunity to re-think how roads, bridges, culverts, etc. are designed in the first place. For instance, given the potential for increased precipitation, perhaps it makes sense to increase the engineered capacity of roads to mitigate polluted runoff and reduce the vulnerability to flooding. The state Department of Transportation currently designs its roads to take these considerations into account but these standards do not necessarily apply to local roads and do not fully address the issues of increased storm runoff.
  - In both the Transportation and Ecosystems breakout groups, participants discussed the possibility of connecting transportation funding with MS4 permitting needs. Certain roads may contribute more than others to overall nonpoint source pollution in a given municipality. Because these roads in theory would cost the municipality more, transportation improvements could be prioritized based on the road runoff volumes and would either reduce impervious cover or include green infrastructure solutions to reduce runoff entering waterways.

  - Participants also suggested that there could be more coordination of resources and personnel between town public works departments to reduce the costs of maintaining local roads.
  - Lastly, participants expressed a need to create longer-term assessments of the regional transportation network. By understanding the on-the-ground impacts of sea-level rise, regional and municipal planners can better understand which roads to invest in and which may need to be phased out of use. By conducting this assessment at a regional scale, municipalities will have a better sense of which investments to prioritize for regional resilience.
- **Challenge: Vulnerability of primary arterial roads to storms:**
  - **Prioritize state and local funding for infrastructure improvements that will contribute to future community resilience:** Looking at a longer time horizon, transportation planners and engineers could ensure that their efforts would not be undermined by future sea levels. These assessments could be coupled with local planning and vulnerability assessments of roads and the neighborhoods they service. In some cases, these vulnerable roads may be important to double down on and protect while in others, the tough decision may need to be made to reduce maintenance or phase the road out of use. Projects that can make the case for their contribution to the resilience of the whole community and region could benefit from a streamlined permitting process and easier access to funding at the municipal level.
  - **Cross-municipality collaboration to identify largest regional transportation vulnerabilities and share planning, engineering, and monetary resources to enhance regional resilience:** The impacts of transportation vulnerabilities on regional resilience frequently cross municipal boarders. Therefore, it makes sense for municipalities to share resources to address these challenges. Funding towards raising an important regional road for instances could be shared by all affected municipalities. Some other options for regional collaboration around transportation could include collaborating on model ordinances and design standards for resilient transportation projects.
  - **Integrate green infrastructure and natural assets into transportation upgrades and retrofits through design standards and codes:** Green infrastructure often provides cost effect means to improve the longevity of transportation engineering projects. However, these strategies are not always implemented where they could create the most value. One way to promote these practices could be to include them in municipal design standards and building codes for upgrades and retrofits.
  - Flooding of arterial roads during storm events has the potential to strand many people and hinder emergency access. Mitigating this vulnerability at

the infrastructure level can be approached from a number of angles and often is best served by utilizing multiple strategies. Inland and coastal wetlands provide storm storage and buffers that can slow and infiltrate storm surge and flood waters before they become a problem for motorists. Roads can also be raised above flood levels

- In addition to infrastructure improvements, participants suggested improving evacuation communications as a cost effective way to mitigate these vulnerabilities.
- As sea levels rise, the migration of salt marshes is hindered in a few areas by major roads. If the marsh is unable to make this transition, there will be a significant loss of biodiversity and ecosystem services along the coast. Where possible, those responsible for transportation planning should accommodate this movement by re-sizing culverts and/or consider removing less critical roads. In some instances, undersized culverts may actually increase vulnerability of adjacent communities during storms as storm surge becomes bottlenecked and increases in velocity.
- Road transport in and out of Groton-New London Airport is vulnerable to both seal level rise and storm flooding in a few locations. Assessing and adapting to these specific threats should be a regional priority for transportation planning.

- **Challenge: Emergency transportation for transit-dependent communities:**
  - **To reduce needs of transit-dependent communities during emergencies, municipalities and public transit services could establish mutual aid agreements with nearby inland urban centers such as Hartford and Worcester to share busses with real-time mapping of available resources.**
  - Smart phone apps for real-time bus mapping is already being used in Hartford and New Haven to improve user-accessibility for public transit. This kind of information could also be useful in emergency situation as those who don't regularly take use of these services can more easily plan their evacuation. This information could also be included in existing reverse 911 services and/or social media notifications.
  - The current capacity of public transit may not be enough to adequately manage larger scale evacuations. Participants suggested that the region could perhaps arrange mutual aid agreements with nearby inland urban centers such as Hartford and Worcester to share buses in emergency situations.

Overarching Solutions Identified:

- **Funding for infrastructure improvements at the state and local level could be prioritized based on how much it will contribute to future community resilience.** This means that communities would consider current as well as future vulnerabilities of roads and the neighborhoods they service when making construction and maintenance decisions. In tandem with this, projects that do demonstrate a pressing need from a community resilience perspective could have a streamlined permitting and funding process to allow municipalities to more easily access funding.
- Municipalities could also work together to identify largest regional transportation vulnerabilities and then share planning, engineering, and monetary resources to build the resilience of these areas. More generally, municipalities could collaborate on model ordinances and design standards for transportation projects consider the construction and repair of transportation infrastructure.

Energy

- **Challenge: Energy infrastructure and storm damage:**
  - **Take steps to strengthen and redesign the distribution system**: Microgrids and other similar strategies provide redundancy to and can isolate damage to the electrical distribution system. In doing so, they can help the region to respond more quickly to energy infrastructure damage and interruptions. Participants expressed a particular interest in examining the potential benefits of using microgrids in urban areas in conjunction with locally sourced energy such as solar panels.
  - **Ensure that state and local emergency response plans include provisions for speeding up recovery of energy infrastructure:** As the loss of power can have severe impacts on businesses and potentially deadly impacts on residents, recovery of the energy infrastructure is a high priority for overall regional disaster recovery. Communities could review emergency response plans along with the state and utility plans to ensure that energy recovery is fully considered.
  - One of the most fail safe approaches to protecting power lines is to bury them in much the same way that one would bury water lines. Participants offered this as solutions but conceded that this could be a very expensive proposition that would have limited application except within existing urban areas such as New London.
  - Another approach is to manage the forests immediately adjacent to powerlines to prevent damage from falling trees. UCONN CLEAR is

developing a program called Stormwise which is intended to take on this very solution.

- In the immediate aftermath of a storm, recovery is often limited by the availability of staff. Energy companies such as Eversource have mutual aid agreements and memorandums of understanding with other energy service entities, which allows technicians from other regions to come and provide help. Where possible, participants suggested, these agreements should be strengthened and expanded.
- Lastly, participants pointed out that given Millstone's safety concerns as well as its inordinate importance for energy in the northeastern region, every effort should be made to ensure that this facility is properly prepared for extreme weather events.

- **Challenge: Communications disconnect between consumers and providers:**
  - **Improve communications among stakeholders within the energy system:** Steps could be taken to help consumers better understand the challenges that energy providers face. Similarly, providers and regulators that tend to work on larger scales than municipal offices may benefit from a better awareness of the needs of communities and large institutions such as universities. In addition to information, such communication could also surface opportunities for sharing resources.
  - **Target and incentivize consumer behavior such as in-home energy conservation (i.e., Smart Living) and tree removal on private property as a strategy to improve overall regional energy resilience:** Often the biggest changes occur from the culmination of many small actions. These decisions often happen in the home and on properties but can have profound effects on overall community resilience. There are already a number of initiatives by energy providers to connect with and educate consumers. Participants felt that many of these projects, which are available through multiple media platforms, should be strengthened and expanded. Other outreach programs such as the Institute for Sustainable Energy at Eastern Connecticut State University could also provide effective collaboration in this regard. In particular, participants wanted to see more efforts to raise consciousness amongst consumers about energy consumption, sources of energy, and how these decisions affect the costs of one's energy bill.
  - Consumer could also be made more aware of existing funds for energy audits, energy efficient lightbulbs, faucets, etc. that are already included in the current billing procedures. However, participants stated that there should be a clear communication as to the follow up steps from an energy audit. There is a need to provide home owners with the follow-on conversation about longer term planning to reduce energy consumption and

sources of energy available. Participants believed that there is a messaging opportunity to help tie household level decisions in with a more sustainable regional energy future.

- Some participants working in the planning sector said that they would benefit from more user-friendly policy guidance documents concerning the particulars of energy sources. Currently, some municipal planners find it difficult to include considerations of energy resilience into Hazard Mitigation Plans and Plans of Conservation and Development because of lack of data related to energy provision. Where appropriate, municipalities should work with energy services to determine how and where these documents can include considerations of energy decisions.

- **Challenge: Uncertainty regarding future of local energy production:**
  - With regards to the future of Millstone, participants expressed concern that citizens and community leaders are not considering the effects of increasing water temperatures in Long Island Sound on the power plant's ability to function that they and are putting too much faith in a technological fix. Participants felt that this reality could be an impetus more community leaders to look more closely at opportunities for other, locally produced energy sources.
  - Participants expressed the sentiment that improve battery storage technology will truly revolutionize the future of energy production and consumption. Unfortunately, the technology necessary for this is not quite ready.
  - Participants felt that local institutional and academic knowledge could be better harnessed to promote collaboration across sectors.

Overarching Solutions Identified:

- **Lobby for regularly updated state building codes with energy efficiency standards:** While working directly with producers and consumers can have real benefits for energy efficiency, stakeholders can also address these issues through legislation. The state building codes provide the foundation that all building projects in municipalities must abide by. The current time frame for updating these codes may not be sufficient for keeping up with advances in building technology, renewable energy, and national energy policy. Conducting these updates with more regularity may provide more opportunities for concerned citizens and organizations to have their voices heard on these issues. As an additional benefit, more regularly updated state building codes may provide more flexibility in the face of changing environmental conditions.

- In order for the region to respond more quickly from energy infrastructure damage, steps could be taken to strengthen and possibly redesign the distribution system.
- Efforts could be made to improve communications among the various actors within the energy system (providers, consumers, regulators, universities, etc.). Energy issues could perhaps be integrated into the core curriculum as a way of raising general awareness.
- Targeting and incentivizing consumer behavior such as in-home energy conservation and tree removal on private property can have large impacts on regional energy resilience. The Smart Living Catalogue is an excellent source of information in regards to energy efficient tools and strategies.
- Communities and states should make sure that they have response plans in place specifically designed to speed up recovery of energy infrastructure.

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Economy

- **Challenge: Effects of coastal hazards on municipal grand lists:**
  - **Make an economic argument for resilience planning and emergency management to community leaders and municipal officials:** A fiscal impact study of extreme weather and sea level rise scenarios across Southeastern Connecticut may help to better align economic development with environmental reality. This study can be conducted at different levels of detail. For instance, a simple study could compare projections of flooded properties with their tax contribution while others may take into account factors such as loss of business and degradation of natural assets.
  - **Reduce long-term over-reliance on high-value, residential property for tax revenue:** By planning to move development off the coast, municipalities can decrease the vulnerability of their grand lists to sea level rise and extreme weather events. As a long-term strategy, this transition can be accomplished in conjunction with economic development activities by incentivizing future development in higher density villages and city centers that are already well protected from flooding hazards.
  - **Ensure that planning documents prioritize more compact mixed use areas with infilling that have a smaller footprint and are out of the way of current and future coastal ecosystems:** Moving the built environment that supports economic activity out of harm's way may be in some cases the best investment from a community resilience perspective. While such actions may require significant upfront costs and public engagement, in the long run, this will eliminate many emergency management, utility service, and road

maintenance costs. These acts will also reduce the vulnerability of the tax base to extreme events and sea level rise.

- **Economic diversification:** A general diversification of the economy may help to reduce the residential development demands on local ecosystems. In the long run, if ecosystems such as salt marshes were to degrade from rising sea levels, economic diversification can help to minimize the impact that the loss of these scenic and recreational assets may have on the regional economy.
- In order to reduce the infrastructure associated with coastal communities, municipalities could transfer some of this responsibility to the homeowners. Perhaps municipalities would charge these property owners with a fee to help maintain local roads, sewer and water systems, pump-outs after a storm. This would decrease the tax burden on the rest of the communities to provide for these property owners.
- Municipalities could also reduce their reliance on coastal neighborhoods by encouraging residential growth or infill in other parts of their communities.
- Participants suggested that mandatory evacuations pre-storm would be a way to reduce emergency service costs.

- **Challenge: Short and long-term effects of flooding and power outages on business continuity and resource recover:**
  - In 2015, The Regional Emergency Planning Team produced a series of documents for handing various issues during disaster situations in Eastern Connecticut. The Regional Emergency Support Function 7 concerns private sector recovery and response. This document includes a model ordinance that municipalities can adopt that would establish a Recovery Management Organization to help coordinate business recovery. Adopting this ordinance would provide a municipal-based structure to address this challenge.
  - Participants expressed an interested in expanding recovery drills to include local businesses. This would help to make these exercises more closely simulate the actual event while helping business owners to better understand the vulnerabilities they face.
  - Other solutions included:
    - Partner with other organization to respond to disasters to help get businesses back up and running
    - Inventory all businesses in the area with generators
    - Establish mutual aid agreements between towns to assist with permitting and inspections post-disaster
    - Where it is not the case, grant municipal staff that authority to take action to protect public health, safety, and welfare during post-disaster recovery.

- **Challenge: Post-storm transportation complications and limited access for businesses and employees:**
    - **Inventory available space for temporary operations and coordinate with relevant parties to ensure that enough space is available in immediate aftermath of disaster:** Communities can help with business recovery by exploring opportunities to share important business infrastructure such as office spaces and refrigerators during and immediately following storm events.
    - Participants developed a couple of ways to address the problems of employees being penalized and/or fired for missing work during a storm event. On the legislative side of things, organizations could lobby for additional employee protections during disaster situations. Another complimentary approach could be to designate shelters near major employers and/or business areas where employees and families could stay in the days immediately following the disaster. This strategy could be explicitly included in regional and municipal hazard mitigation plans.
- **Challenge: Negative effects of natural resource degradation on economy:**
    - Participants discussed the need to more accurately map and quantify the value of local natural resources in order to more accurately justify the necessary investments to protect them.
    - Planners must also consider the long term implications of guiding development in a changing climate. Criteria for future development could prioritize more compact mixed use areas that have a smaller footprint and are out of the way of current and future coastal ecosystems.
    - A general diversification of the economy may help to reduce the demands on local ecosystems while decoupling some of the negative effects associated with natural resource degradation. For example, many municipalities rely heavily on coastal homeowners for a large portion of their tax revenue. By developing other reliable sources of revenue such as taxes from new businesses, municipalities will be less driven to protect these areas at all costs. This may make the eventual buyout of these properties less harmful to the municipal budget. Additionally, if recreational opportunities were to decrease due to future declines in water quality, a more diversified economy may be more ready to absorb the loss of tourism revenue.
- **Challenge: Preparedness training for municipalities, businesses, and social service organizations:**
    - **Improve coordination of disaster recovery between public and private stakeholders:** Currently, municipalities and individual businesses assume responsibility for their individual disaster recovery plans and conducting practice exercises. Small businesses in particular often do not have the time

or resources to invest in these activities. However, recovery of the public and private overlaps in many areas such as transportation and utilities. By hosting recovery drills with a wider range of stakeholders, communities may be able to more efficiently plan for and respond to disasters. Regional planning agencies may be well-positioned to advance more collaborative disaster recovery planning and response because of their unique ability to integrate state and local initiatives.

- Disaster preparedness is generally a difficult topic to get people excited about, and it is easy for such efforts to be overlooked. However, well-coordinated training exercises have the potential to have a significant payoff by limited loss of business revenue and emergency management costs. Participants believed that finding more effective ways to push for more training opportunities would be worthwhile. By conducting an economic study of the region's vulnerabilities to large storms, planners and emergency managers may be able to more effectively make their case for better planning and training opportunities. Trainings could also be tailored for specific business types.
- In addition to lobbying for more training opportunities, participants discussed ways to make these trainings more effective. These strategies included including involving as many real-life players in these trainings as possible including business owners and social service organizations. This would help to identify communication and response gaps while also giving stakeholders greater awareness of their own vulnerabilities. Participants also suggested that municipalities and insurance agencies make an effort to share documents to ensure that all parties have what they need to coordinate an effective recovery.
- Lastly, participants discussed preparation strategies that may help to provide a more efficient recovery. These included stockpiling generators so that municipalities, businesses, and social services are all assured access. Businesses and municipalities could also collaborate to identify alternative temporary office spaces for businesses to house employees in the case of damage business facilities.

Overarching Solutions Identified:

- Participants believed that making an economic argument for resilience planning and emergency management has a large potential to help make impacts feel more real for community leaders and municipal officials. NGOs and/or consultants could help municipalities with mapping and quantifying the economic impacts of different storm and climate scenarios.

- Participants also believed that disaster recovery could be more effectively coordinated between individual municipalities and between municipalities, non-profits, and the private sector. Regional planning agencies such as SCCOG and SeCter may be well-positioned to spearhead disaster recovery planning and response because of their unique ability to integrate state and local initiatives.
- Planning to move development off of the coast will help to reduce emergency management costs in the long-term. This can be accomplished by incentivizing future development in inland, well-protected areas. For existing, vulnerable developments municipalities can potentially nudge long-term coastal retreat by charging property owners for infrastructure maintenance. Participants also suggested that there are potential conflicts coastal development policies that could be better aligned. For instance, FEMA insurance policies often pay for damaged houses to be rebuilt where they are, which may not be the desire of the town or in the interest of other rate payers.
- One of the most important actions communities can take to help business recovery is to inventory available space for temporary operations and coordinate with relevant parties to ensure that enough space is available in immediate aftermath of disaster.

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