Harper College

2020 Environmental Scan

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Executive Summary

At the time of the publication this report the world is experiencing a catastrophic global pandemic. The magnitude and duration of the impacts are unclear, but in the near-term are having dramatic effects on educational institutions. While it is too early to make exact predictions, it is worth noting that a prolonged recession or a shift to re-shoring of industrial supply-chains could result in increased demand for training. It is also evident that distance learning and education-related technologies will receive a major boost and those institutions that are planning and investing wisely will be at a competitive advantage. There is no data available at this stage to convey how the pandemic will impact the Harper region, but it is clear there will be great impacts to the national and global economies.

Higher education in Illinois is facing a challenging environment. It holds abundant opportunities for preparing a new generation of workers for rewarding careers, as well as helping mid- and late-career workers to remain productive and competitive as new technologies continue to reshape the economy and workforce. Harper, along with its peer institutions, will also face ongoing challenges in changing demographics, slow and uneven economic growth, fiscal uncertainty, and rapidly changing demands for educational programs and platforms. This report provides the basis for strategic planning by presenting relevant data and analysis necessary for Harper College stakeholders to make better informed decisions about the future goals, priorities and direction of the institution.

Despite the district's location in one of the State's remaining growth areas, a sizable youth population and the aging of the population is shifting market demand for higher education in the direction of serving mid- and late career working adults. The competition between institutions for declining numbers of high school graduates and other young adults will increase. In addition, the district's changing racial and ethnic composition will necessitate marketing and programming changes to reach and serve the needs of a more diverse constituency. Coupled with the continued influx of foreign-born populations, this suggests that support programs, such as English language learning, will need to expand to attract and retain students.

Harper has the advantage of being part the Chicago metropolitan area, one of the largest and most dynamic labor markets in North America. The rapid advance of automation in the workplace presents the district with the challenge of serving the education and training needs of local employers while offering residents, as well as commuting workers, educational opportunities that will help them compete for jobs throughout the region. At the same time, innovations in delivering education and training to students gives Harper numerous options for maintaining, expanding or creating new programs.

Although there are many factors in favor of Harper's continued growth, it is not immune to the many challenges faced by the rest of the State. Changing demographics and recent economic trends, combined with Illinois' ongoing fiscal distress, portend significant challenges for primary and secondary school systems, as well as institutions of higher education. As income and property values continue to fluctuate, the budgets of public institutions are being reduced and threatened with further cuts. Moving forward the pressure on colleges and universities to deliver relevant, high-quality education and training opportunities while operating cost-effectively and remaining affordable will increase.

Introduction

This environmental scan is intended to provide a baseline of information for Harper College's FY 2021-2024 Strategic Plan. Understanding the current operating environment and future trends at the local, state, national and global levels will assist Harper's leaders and stakeholders in choosing the best course of action. The environmental scan provides insight on many indicators and trends in the areas of demographics, economics, K-12 sender districts, housing, workforce, apprenticeships, and a program gap analysis.

Primary data sources used for this scan included public agencies such as the Illinois Department of Employment Security, Illinois State Board of Education, U.S. Bureau of Labor Statistics, U.S. Census Bureau, the National Center for Education Statistics, and the Illinois Department of Revenue. Additional resources also came from private institutions providing freely accessible data, such as the Woodstock Institute research on foreclosures. Several subscription-based data resources were from private vendors such as EASI Analytics and Labor Insight's Burning Glass. An additional data source is the Society for College and University Planning (SCUP) used to create thought-provoking discussions on additional topics throughout the scan.

Whenever possible, data are provided for communities within Harper district boundaries. However, some data are not available at the district level, in which case other geographies were used as a proxy, as indicated with the data visualizations. For example, county-level data are used for workforce information.

The most current data are used in the environmental scan, but even the most current data may lag by one or two years, due to the time it takes agencies to process and publish the data. The U.S. Census Bureau data is from the American Community Survey five-year estimates, which is necessary because the populations of the sender districts are too small to have one-year data available to produce annual trends.

Key Trends and Considerations

Demographic Trends

Trend #1: Birth rates continue to decline, death rates continue to increase, while the net count of Illinois residents moving in and out of the state continues to decline, causing the Illinois population to decline overall since 2013.

Likelihood that the trend will continue over the next 3 to 5 years: **High**

Supporting rationale:
- Birth rates have been declining over the last decade.
- Death rates and numbers are increasing as the Baby Boomers reach the end of their life spans; there more Baby Boomers in comparison to other generations.
- Domestic migration has been negative, and the rate of loss continues to increase throughout the state.
- Harper has large population growth in the Asian population who are replacing the residents who are moving out of the area, creating a stagnant population change.

Sources:
- U.S. Census Bureau, American Community Survey
- U.S. Census Bureau, Population Estimates
- Center for Disease Control, WONDER database

Trend #2: The Harper District is becoming more diverse.

Likelihood that the trend will continue over the next 3 to 5 years: **High**

Supporting rationale:
- One in twenty White residents are moving out of the Harper district.
- While the Harper district lost 16,421 White residents, they were primarily replaced by new Asian (11,021), Latinx (3,111) and Other races or combinations (2,146) creating stagnant population growth.
- Residents are becoming more linguistically diverse: primarily Asian & Pacific Islander languages.

Sources:
- U.S. Census Bureau, American Community Survey
- U.S. Census Bureau, Population Estimates

Trend #3: The proportion of Harper residents obtaining an Associate degree or higher is increasing among those over the age of 24.

Likelihood that the trend will continue over the next 3 to 5 years: **Moderate**

Supporting rationale:
- Sixty percent of those aged 25 and older have at least an Associate degree in the Harper district compared to 42.1% of the Illinois population.
- The Asian population has a tendency towards higher education achievements and employment in high-tech and high-wage positions. Their increasingly growing community is contributing to the higher education attainment.

Sources:
- U.S. Census Bureau, American Community Survey
- U.S. Census Bureau, Population Estimates

Trend #4: Due to the aging population, the median age has increased, on average, by two years in the four-county region.

Likelihood that the trend will continue over the next 3 to 5 years: **High**

Supporting rationale:
- The Baby Boomer generation is the largest generation in number and they are now reaching retirement age skewing the median age towards the upper end.
- The younger generations are not having as many children as prior generations so there are not enough children to offset declines in the older generation.

Sources:
- U.S. Census Bureau, American Community Survey
- U.S. Census Bureau, Population Estimates

Economic Trends

Trend #5: Median Household Income nationally has recovered and improved for those in the upper income levels, but mid- and lower levels are struggling to reach pre-recession levels.

Likelihood that the trend will continue over the next 3 to 5 years: **Moderate**

Supporting rationale:
- From 2007 to 2016, the median household net worth by income for the upper-income levels have increased by $70,700. The lower-income levels have declined by $7,700 and the middle-income levels lost $53,200.
- Cook County wages finally surpassed the December 2000 level in June 2018.

Sources:
- U.S. Census Bureau, American Community Survey
- Illinois Department of Employment Security

Trend #6: The U.S. gross domestic product has been trending over 2.0% on average annually since 2009, while Illinois just climbed to 2.1% in 2018.

Likelihood that the trend will continue over the next 3 to 5 years: **Low**

Supporting rationale:
- Illinois had the highest GDP growth in the 2017-18 year since 2005-06. Affected greatly by the Great Recession the Illinois economy struggles to regain strong sustained growth.
- While Illinois has had growth since the 2009-10 year, it is unclear if the 2.1% growth in the 2017-18 year is a new, higher trend, or a blip.
- The unknown of Coronavirus impacts could greatly change the GDP trajectory in Illinois, nationally and globally.

Sources:
- Bureau of Economic Analysis

Trend #7: The pensions continue to weigh down the budget in Illinois as new sources are tapped to shore up the pension fund. The State University Retirement System unfunded liability is $133.5 billion in 2018, an increase of $47.9 Billion since 2010.

Likelihood that the trend will continue over the next 3 to 5 years: **High**

Supporting rationale:
- Illinois increased higher education funding by 29.7% from 2008 to 2018, almost twice the amount as the next greatest increase in North Dakota.
- The Baby Boomer generation is reaching retirement age and due to there being more of them in numbers, the pressure on the pension system will continue.
- Further exacerbating the problem is the loss of enrollments in Illinois of 13.3% since the Great Recession, the greatest decline in the country.

Sources:
- State Higher Education Executive Officers Association

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Sender District Trends

Trend #8: The schools continue to diversify as the resident population evolves. The White student population remains a majority in the Harper district, but many Latinx and Asian students are moving into the districts.

Likelihood that the trend will continue over the next 3 to 5 years: **High**

Supporting rationale:
- Illinois is continuing to diversify, primarily growing the Latinx community.
- The Harper region remains attractive for affordable housing for high tech employment bringing new residents from diverse backgrounds with families.
- The high performance of the sender schools will continue to attract families.
- Many of the new residents are replacing those in the White community that are leaving.

Sources:
- Illinois State Board of Education, Report Card
- U.S. Census Bureau

Trend #9: Public school enrollments are stagnant since 2017.

Likelihood that the trend will continue over the next 3 to 5 years: **High**

Supporting rationale:
- Illinois has been losing population overall since 2013, primarily due to the White community moving elsewhere and not having enough other communities to replace them.
- The Harper region has maintained population due to the increase in new residents among the Asian community to replace the declining White community, but not to the point of increasing enrollments.

Sources:
- Illinois State Board of Education, Report Card
- U.S. Census Bureau

Trend #10: The minorities, when combined, make up the majority in Wheeling CCSD 21, Community Consolidated SD 59, Palatine CCSD 15, Schaumburg CCSD 54, and Township HSD 211.

Likelihood that the trend will continue over the next 3 to 5 years: **High**

Supporting rationale:
- The trend of minorities becoming the majority is occurring throughout the country but primarily in the younger age groups.
- As the Harper region continues to diversify the minorities will become a greater proportion of the student population.

Sources:
- Illinois State Board of Education, Report Card

- U.S. Census Bureau

Trend #11: Performance indicators Dropout rates have increased for all high schools in 2019 but remain below the state average.

Likelihood that the trend will continue over the next 3 to 5 years: **Medium**

Supporting rationale:
- The performance of the Harper schools remains above average and the dropout rate, while spiking in the 2019 school year, did not surpass the state average.

Sources:
- Illinois State Board of Education, Report Card

Trend #12: Many high schools experienced a drop in the four-year graduation rates but remain well above the statewide average.

Likelihood that the trend will continue over the next 3 to 5 years: **High**

Supporting rationale:
- The high schools in the Harper district have historically had high graduation rates in comparison to the state average.
- Many of the high schools experienced a decrease in the graduation rate for the 2019 school year (eight schools), while the remaining four schools reported an increase.

Sources:
- Illinois State Board of Education, Report Card

Housing Trends

Trend #13: Foreclosures are down to lower rates than before the recession, lending stability to neighborhoods.

Likelihood that the trend will continue over the next 3 to 5 years: **Low**

Supporting rationale:
- The Harper district housing has recovered from the Great Recession to lower foreclosure rates.
- The impact of Covid-19 could have a great impact increasing foreclosure numbers as residents lose their jobs during the shut-down of society.

Sources:
- Woodstock Institute
- Illinois Realtor's Association

Trend #14: There have been 4,388 previously owner-occupied housing units transitioned into rental units since 2012 to meet demand after the recession. The trend reduces homeownership stability and equity for large purchases such as tuition.

Likelihood that the trend will continue over the next 3 to 5 years: **Low**

Supporting rationale:
- During periods of lost homeownership, mortgage companies will transition homes into rentals due to the decline in demand to purchase.
- Baby Boomer style of large homes are not as attractive to younger generations who are looking for smaller, open concept homes decreasing the larger homes to much lower prices to sell, in some instances half their value.

Sources:
- U.S. Census Bureau
- Illinois Realtor's Association

Workforce Trends

Trend #15: Although unemployment remains at record lows, many employers are struggling to find qualified workers.

Likelihood that the Trend Will Continue Over the Next 3 to 5 Years: **High**

- Although unemployment rates continue to decline, much of this can be attributed to falling labor force participation. At the same time, many employers are struggling to find qualified workers. The mismatch between the skills and experience required for available jobs and those of job seekers continues to be a barrier.
- Important industry sectors, including Manufacturing, are still experiencing job losses. This is due to competitive pressures and business climate issues with the State, as well as uncertainty in the global economy.
- The increasing out-migration of youth and working age adults from Illinois in recent years is having a serious impact on employers throughout the State and may be a factor in businesses leaving the State or choosing to expand elsewhere.
- Many unemployed workers have skill sets that are not readily transferable to growth industries like Healthcare and Professional and Business Services, making it more challenging to get dislocated workers back into gainful employment.
- The quickening pace of automation across all industries is going to impact not only the number of jobs opportunities, but also create a critical demand for new training courses and programs to help current and future workers to remain competitive in the labor market.

Sources:
- Economic Modeling Specialists, Inc.
- Illinois Department of Employment Security
- McKinsey Global Institute

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Meeting the Needs of Business and Industry

Trend #16: Job growth continues to lag the U.S. average and some industry sectors continue to struggle.

Likelihood that the Trend Will Continue Over the Next 3 to 5 Years: **High**

Supporting Rationale:
- Many of the service sectors, such as Healthcare, Transportation and Warehousing, and Business and Professional Services, have enjoyed substantial job growth over the past decade. However, other important sectors such as Construction and Manufacturing are continuing to experience slow job growth or job losses.
- Although local factors can play a significant role in job gains and losses, it appears that changes in the global economy, technology, and industry restructuring are having a greater influence.
- State business climate factors and the continuing out-migration of youth and working-aged populations are also a factor.
- Because many of the jobs being created or lost between these industries require vastly different skill sets, the demand for education and training for dislocated workers should be strong.

Sources:
- Illinois Department of Employment Security.
- Economic Modeling Specialists, Inc.

Trend #17: Most of the demand for workers over the next decade will stem from the need to fill existing positions rather than from new jobs.

Likelihood that the Trend Will Continue Over the Next 3 to 5 Years: **High**

Supporting Rationale:
- As the population continues to age and employers face a wave of retirements the demand for workers to replace them will grow. Job openings from existing positions will outpace new job openings by a ratio of 2 to 1 overall.
- With two-thirds of projected jobs requiring only a high school degree or GED, Harper can play a role in helping students plan careers that begin with an entry-level job but grow into careers with expanded earnings potential.
- Manufacturing remains an industry sector of great strategic importance despite its declining share of employment.
- Health care and social assistance, transportation and warehousing, and accommodation and food services also offer significant employment opportunities.
- As Harper continues to partner with area employers and offer quality education and training programs for its students, a major challenge will be to help connect students with local employers and actual job opportunities.

Sources:
- Illinois Department of Employment Security.
- Economic Modeling Specialists, Inc.

Demographics

The face of Illinois has been changing dramatically over the last decade. This section portrays some of the changes and explains why they are important to monitor by Harper College. Having knowledge of what future changes (or lack of change) may take place helps to inform decision-making processes.

Population

The population loss experienced in Illinois since 2013 has been minimal but certainly noteworthy, as the trend is slowly increasing. Figure 1 shows the net change in population since 2011 for Illinois, the Midwest, and the nation. A decline in the birthrate, increase in the death rate, and changes in the patterns of international and domestic migration all contribute to this change. The net loss of population in Illinois is expected to continue at an increasing rate.

Figure 1: Net Change in Population, 2011-2019
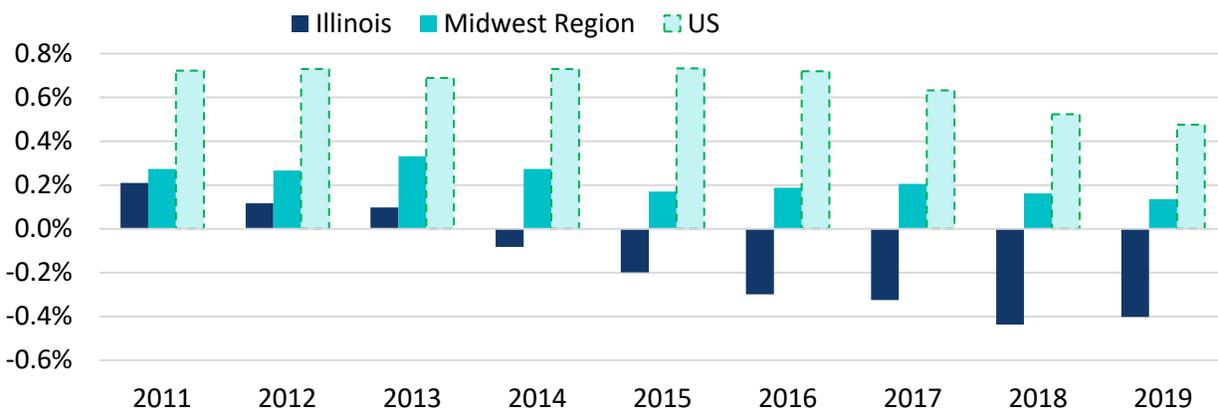
Source: U.S. Census Bureau, Population Estimates Program.

Figure 2 shows the impact of various forces on the overall population in Illinois. As the leading edge of the Baby Boomer generation reaches their late 60s and 70s, the number of deaths, and the death rate, has increased. At the same time, younger generations are waiting longer to start a family, and are not having as many children as previous generations, which has caused the birth rate to decline for many years. As the birth rate and death rate converge, further declines in overall population in Illinois are expected.

However, the largest contributor to population loss in Illinois resides with domestic migration. Domestic migration is the movement of residents from one state to another state. People are moving all the time and, unfortunately for Illinois, more have been moving out than into Illinois. Net domestic migration in Illinois has been negatively increasing for many years, to the point that it overtook gains realized from births and international migration. On net, 2013 was the tipping point of beginning the population loss. Illinois residents who move out of Illinois subtracted from new residents moving into Illinois has resulted in a net loss of 156,000 fewer residents.

Figure 2: Components of Population Change, 2011-2019
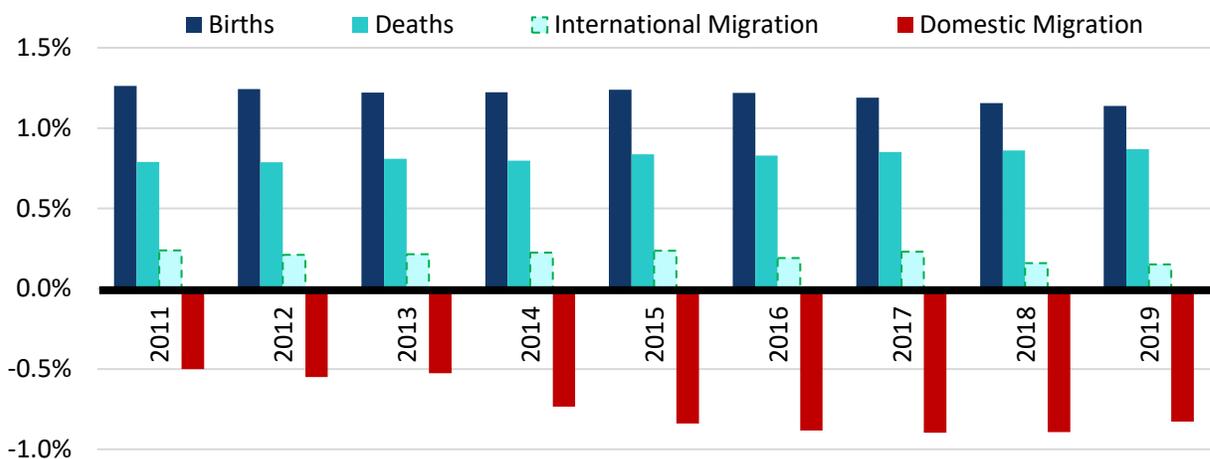
Source: U.S. Census Bureau, Population Estimates Program.

It is anticipated that births and deaths in Illinois will eventually converge as more from the Silent and Baby Boomer generations reach the end of their life span and as children are born at lower rates than in previous generations. If the trajectory remains the same, Illinois will begin experiencing additional net loss as the birth and death rates converge by 2030 (Figure 3).

Figure 3: Births and Deaths in Illinois, 2011-2018
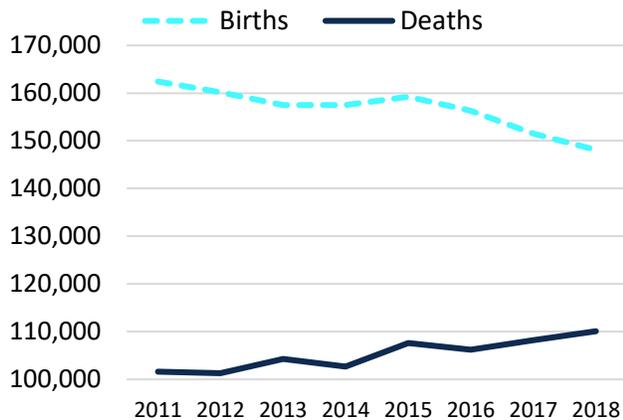
Source: Centers for Disease Control, WONDER.

Race & Ethnicity Changes

The primary driver of population loss in the Harper-overlapping counties has been the decrease in White, non-Latinx, and then Black, non-Latinx residents. If it were not for the Asian, Other, and Latinx populations moving into Illinois, primarily to the Chicago region, the population loss would be much greater. Figure 4 shows the change in the race and ethnicity categories by county, state, and U.S. Illinois has lost 255,193 White and 38,448 Black or African American residents since 2012. The Black or African American residents that moved out were primarily from Cook County and some moved into the surrounding counties, causing a net gain in those counties.

Figure 4: Race & Ethnicity Change in Population by County, 2012-2019

	Population Change	White	Black or African American	Asian	Other	Latinx
United States	13,764,319	277,209	1,929,326	2,674,375	3,553,441	6,972,660
Illinois	-2,363	-255,193	-38,448	94,855	97,024	147,458
Cook County	26,042	-59,553	-54,119	47,263	46,164	68,903
Kane County	15,948	-536	764	3,838	1,606	11,353
Lake County	2,337	-19,664	352	8,938	3,340	11,241
McHenry County	-374	-6,770	808	493	1,988	4,061
Four County Total	43,953	-86,523	-52,195	60,532	53,098	95,558

Source: U.S. Census Bureau, Population Estimates Program.

In the Harper College district, the pattern is slightly different and varies among the K-12 sender districts. The Harper district has White residents moving out and being replaced by all other races, most notably the Asian community. The Black or African American community is shrinking in Township High School District 211 by 1,047 residents but is slightly increasing in the rest of the area, leading to a net gain of 229 residents in the Harper district. The Latinx community is shrinking in the Barrington Unified School District 220 by 1,870 residents, but, due to the rather large increase in the rest of the area, there is a net gain of 3,111 new Latinx residents in the Harper District (see Figure 5).

The overall population change in the Harper district is an increase of 86 residents, which is not significant. But one in twenty White residents moved out, opening the door for a fast change in diversification.

Figure 5: Change in Race/Ethnicity* in Harper District, 2013-2018

	THSD214	THSD211	Barrington	Harper
Not Latinx	-775	-3,962	1,712	-3,025
White alone	-6,834	-8,863	-724	-16,421
Black or African American alone	1,150	-1,047	126	229
Asian alone	4,471	4,267	2,283	11,021
Other	438	1,681	27	2,146
Latinx	1,612	3,369	-1,870	3,111
Total Change	837	-593	-158	86

Source: U.S. Census Bureau, American Community Survey, 2013 & 2018 Five Year Data.
*Ethnicity is defined by the Census Bureau as Latinx or not Latinx, either group can be of any race.

The growth of the Asian community is occurring throughout the country. The communities experiencing growth include: Bangladeshis, Bhutanese, Burmese, Cambodians, Chinese, Filipinos, Hmong, Indians, Indonesians, Japanese, Koreans, Laotians, Malaysians, Mongolians, Nepalese, Pakistanis, Sri Lankans, Thai and Vietnamese. The Bhutanese, Nepalese and Burmese populations are growing the fastest in the United States, while Laotians and Japanese are experiencing the slowest growth rates.

The Harper District is experiencing the most growth from the Indian community, which added 13,129 residents, and was also the largest Asian community in both 2012 and 2018. The remaining Asian communities are growing in smaller amounts or losing population. Of note is the fast growth among the Mongolian population, which is new to the Harper district.

Figure 6: Asian Population Change in the Harper Region, 2012-18

Population	2012	2018	Change	Percent
Indian (Hindu 1920_1940)	27,032	40,161	13,129	48.6%
Pakistani	2,939	4,327	1,388	47.2%
Korean	8,846	10,230	1,384	15.6%
Filipino	8,642	9,837	1,195	13.8%
Mongolian		897	897	
Vietnamese	845	1,292	447	52.9%
Sri Lankan	86	433	347	403.5%
Chinese and Vietnamese	145	436	291	200.7%
Guamanian/Chamorro		245	245	
Tongan		142	142	
Other Asian	215	90	-125	-58.1%
Other Asian race combinations	300	80	-220	-73.3%
Thai	347	77	-270	-77.8%
Nepalese	283		-283	
Hawaiian	306		-306	
Samoan	1,267	739	-528	-41.7%
Other Asian	829		-829	
TOTAL	**52,082**	**68,986**	**16,904**	**32.5%**

Source: IPUMS USA, University of Minnesota, www.ipums.org
*The region is defined as PUMA #3308, 3401, 3415, 3418, and 3419 for 2012 and 2018.

According to the Migration Policy Institute,

> "In 2016, Indians were the top recipients of high-skilled H-1B temporary visas and were the second-largest group of international students in the United States. Today, most Indian immigrants are young and highly educated and have strong English skills. Many work in science, technology, engineering, and math (STEM) fields. From 1980 to 2010, the population grew more than eleven-fold, roughly doubling every decade. In 2013, India and China supplanted Mexico as the top sources of newly arriving immigrants in the United States.[1]"

The increase in the Indian population occurs in the urban areas that have commuter access to the high technology careers in the Chicago Metropolitan Area. There are also many from India attending the universities in the Chicago area who end up working internships here to gain U.S. employment afterwards. There are opportunities for professional development in the STEM fields for these populations.

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[1] Zong, Jie and Jeanne Batalova. Indian Immigrants in the United States. August 31, 2017. Accessed online: https://www.migrationpolicy.org/article/indian-immigrants-united-states.

Figure 7 highlights where the largest changes are taking place as proportional change from 2013 to 2018. The loss of 1 in 20 White residents results in a small proportional loss in comparison to other categories. There was a large jump in the Asian population in Barrington with a 62.2% increase, or 2,283 residents, replacing many of the Latinx residents, 1,870 people, who moved out of the Barrington district.

Figure 7: Change in Race & Ethnicity in Harper's District, 2013-2018
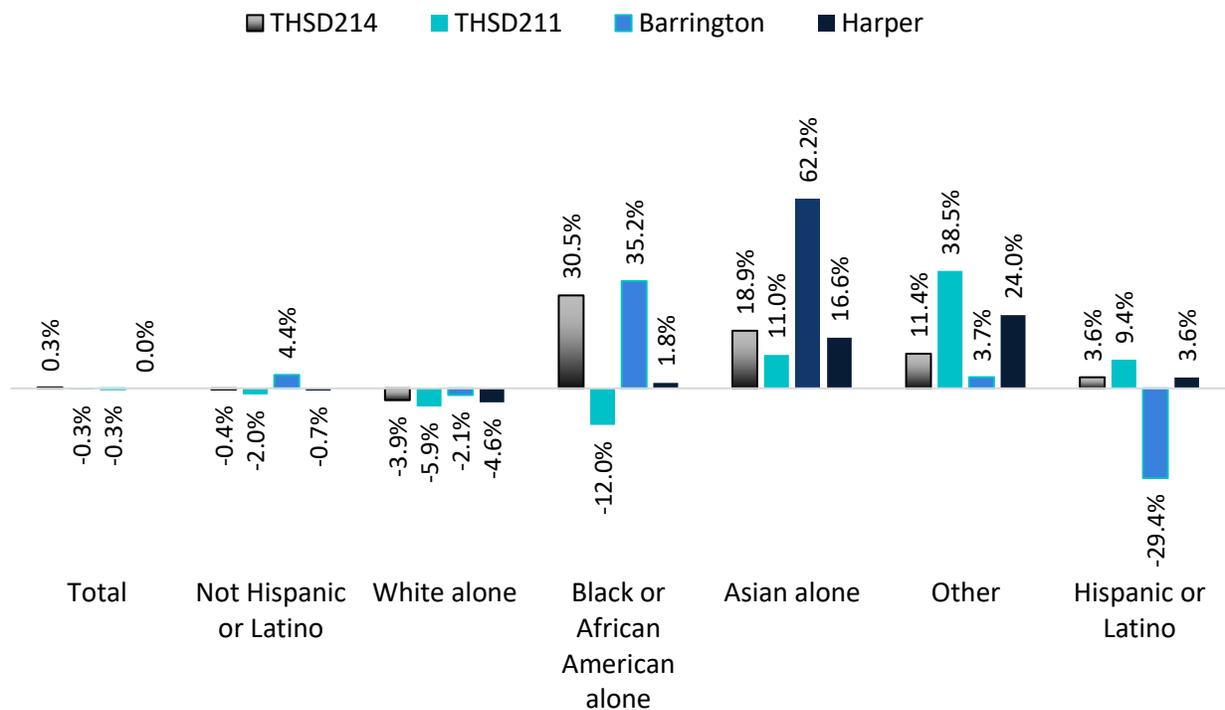
Source: U.S. Census Bureau, American Community Survey, 2013 & 2018 Five Year Data.

Opportunity Youth

Opportunity youth are defined as 16-24-year-olds who are not engaged in either attending school, working, or seeking work. The Harper region has 4,873 youths who are not engaged in work or school, representing 4.8% of that population.[2] The measure is used as an indicator of societal progress and well-being of youth on their transition into adulthood. Nationally, the measure is about one in nine young adults (11.5%) in 2017. A new initiative has been started to "Halve the Gap by 2030" to get more of these youths engaged and started on successful career paths. The City of Chicago is at 14.1% and, when broken down by Race and Ethnicity, shows larger proportions for minority populations.

The Harper population is doing much better than other regions throughout the country, but there are still youths falling behind. The unemployment rate, while historically low, is still in the double-digits for those recently graduating from high school, due in part to the Baby Boomer generation remaining in the workforce longer to recover some of their savings lost in the Great Recession. The opportunity to attend school may provide a viable option for those who are not able to secure sustainable employment, so long as they can afford to attend.

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[2] The data used to quantify opportunity youths is by PUMA region; several PUMA regions overlap the Harper district (see Appendix E for further details).

Many of the opportunity youth live in poor households, dropped out of high school and do not have their GED, are women with children, or have disabilities. Nationally, the growth trend was already increasing for this population. The number of opportunity youth peaked during the Great Recession and has yet to return to pre-recession levels. The Asian population has the lowest proportion that are not engaged, while Latinx and African Americans have the highest, according to the Measure of America[3].

Figure 8: Opportunity Youth in Harper Region, 2018
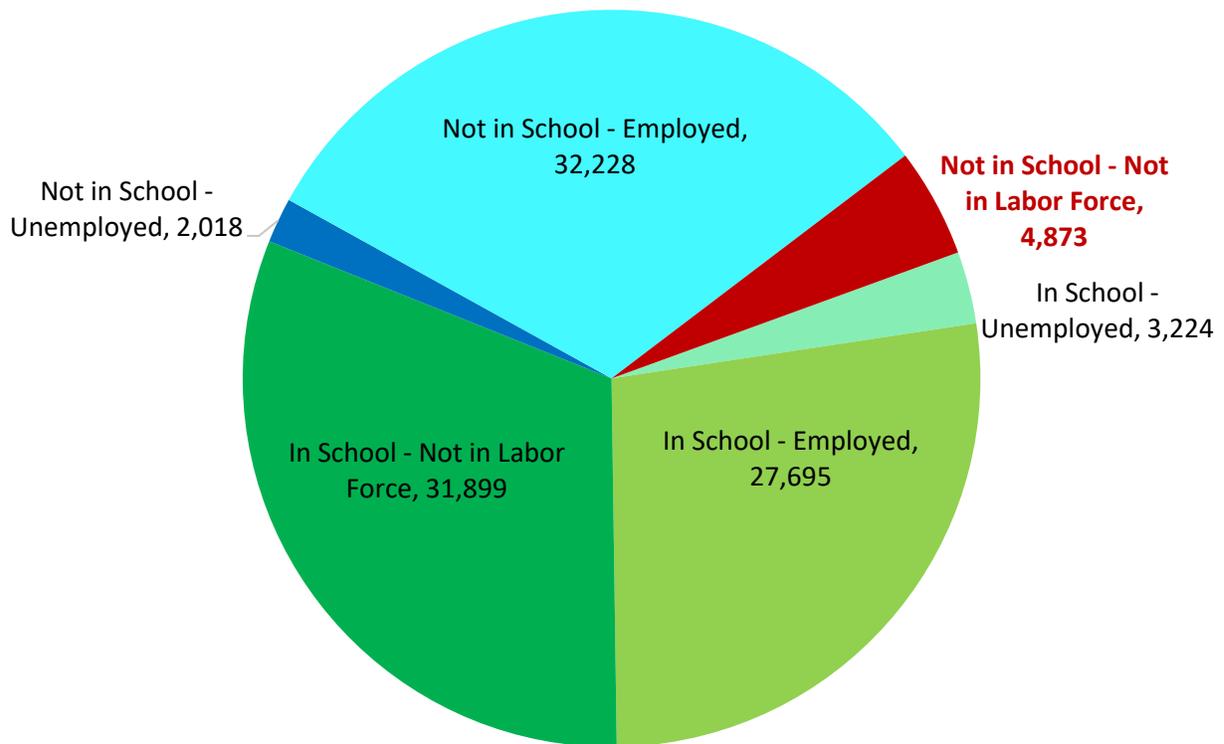
Source: IPUMS USA, University of Minnesota, www.ipums.org. Data aggregated by PUMA, further information in Appendix E.

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[3] Measure of America. Halve the Gap by 2020: Youth Disconnection in America's Cities. October 24, 2013. Accessed online: http://measureofamerica.org/halve-the-gap-2030/.

Languages & Foreign Born

There are many languages spoken in the Harper region and the numbers are increasing. As evidence of an increasingly diversifying district, there has been almost a one-to-one replacement of residents who spoke only English with those who speak another language other than English (bi- or multi-lingual). Figure 9 shows the change in languages spoken in the Harper District from 2013 to 2018 and it is clear there are shifts taking place towards a more diverse community.

The departure of many Latinx from the Barrington district has decreased the number of residents speaking Spanish, but the influx of Asian residents who speak Asian and Pacific Island languages has more than replaced them. Barrington is also the only sender district with a net gain of residents who speak only English, albeit a small amount.

The primary loss are those residents in the Harper district that speak only English, a total of 10,393 residents or 3.3% of the population. They have been replaced with residents who can speak multiple languages, 10,758 people or 5.9%.

Figure 9: Languages Spoken in Harper District, 2013-2018

	Twp HSD 214	Twp HSD 211	Barrington	Harper District	Illinois
Population 5 years and over	-78 (-0.0%)	153 (0.1%)	290 (0.7%)	365 (0.1%)	0.1%
Speak only English	-5,441 (-2.3%)	-5,194 (-2.4%)	242 (0.6%)	-10,393 (-3.3%)	-0.8%
Speak a language other than English	5,363 (2.3%)	5,347 (2.4%)	48 (0.1%)	10,758 (5.9%)	3.3%
Spanish	834 (0.4%)	291 (0.1%)	-1,121 (-2.6%)	4 (0.0%)	2.6%
Other Indo-European [4]	1,492 (1.0%)	4,452 (2.0%)	43 (0.1%)	5,987 (7.9%)	-0.7%
Asian and Pacific Island languages[5]	2,286 (1.0%)	429 (0.2%)	1,209 (2.8%)	3,924 (11.7%)	5.3%
Other languages	751 (0.3%)	397 (0.2%)	-83 (-0.2%)	1,065 (26.0%)	20.4%

Source: U.S. Census Bureau, American Community Survey.

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[4] Other Indo-European languages consist of Spanish, English, Hindustani (Hindi/Urdu), Portuguese, Bengali, Punjabi, Russian, German, French, Marathi, Italian, and Persian.
[5] Asian & Pacific Island languages consist of Chinese, Hmong, Japanese, Khmer (Cambodian), Korean, Laotian, Tagalog, Thai, Vietnamese.

The foreign-born population in the Harper district has arrived from countries all over the world. Mexico is the primary country of origin with 56,107 residents born there, which is just over 25% of all foreign-born residents. India comes very close with 42,992 residents, or 19.8%. Poland is third with 20,186 residents or 9.3%, and the Philippines is next with 8,361 residents, or 3.8%. A full list of the countries of origin is available in Appendix C.

Figure 10: Country of Origin for Foreign Born Population in Harper Region, 2018
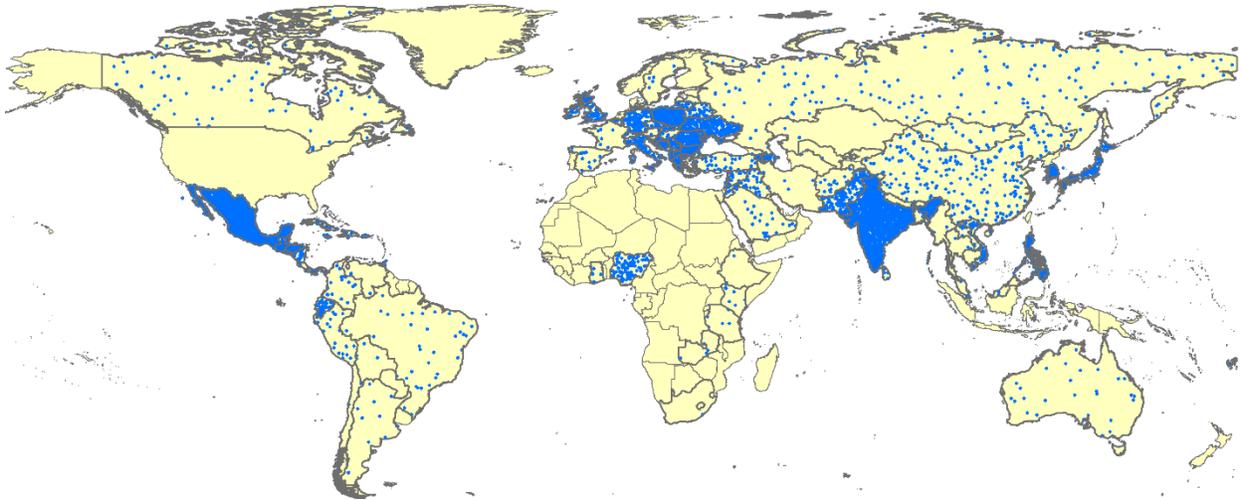
Source: IPUMS USA, University of Minnesota, www.ipums.org.
Aggregated PUMA regions of 3308, 3401, 3415, 3417, 3418 and 3419. Each dot represents 25 people.

Age Composition

The country at large has been undergoing growing pains as the largest generation, Baby Boomers, reach retirement age. There have been medical facilities popping up to meet the demand for senior health care. If adult day care or long-term care is not available or affordable for this population, then working-age adults may need to provide care or find affordable in-home care for aging parents, while still trying to care for their own children. The pressure to provide care for aging parents is growing as the numbers continue to increase of those 65 years of age and older.

The dependency ratio is the number of adults 65 and older and children ages 17 and younger divided by the number of working-age adults (18 to 64 years of age). Figure 11 shows the dependency ratios for the residential population in the Harper district. Township High School District 211 has the lowest dependency ratio, at 58.0, meaning for every 100 residents, 21.9% are over 65 and 36.1% are children under 18, leaving 42% who are working-age residents, 18-64 years old. The higher the ratio the greater the burden of support on working people. The Barrington population has the highest overall dependency ratio at 77.9, leaving 22.1% of the people to support them. Nationally, the dependency ratio is 61.4 and is expected to continue to increase as the Baby Boomer generation reaches retirement.

Figure 11: Age Dependency Ratios in Harper District, 2018

Source: U.S. Census Bureau, American Community Survey Five Year Data, 2018.
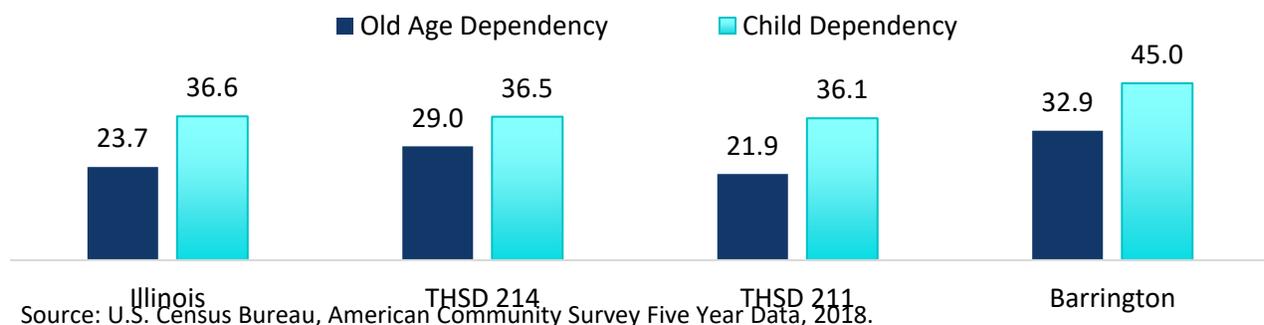
As our population ages, there will be an impact on public funding for dependent services. Children's services are typically supported through local resources while most funding for elderly services comes from the state and federal government. As the dependency ratio continues to increase, the strain on local families, employers, and social services will increase. The lifespan of our population has risen to 78.6 years in 2018 (76.1 for males and 81.1 for females), with a lot of those over the age of 80 requiring intense levels of care. The child dependency ratio is decreasing as fewer children are being born.

Figure 12 on the next page shows the age and gender distribution of the Harper district population. The Harper population is like the age distribution of the state. One notable difference is the decreased numbers in the 15-19 and 20-24 age cohorts. As students leave the Harper district to pursue higher education or move closer to a job outside of the district the young adult numbers decline. By the time the population reaches 25-29 years of age, they are either moving back to the district or there are young working-age residents moving in. The 30-34 age cohort is the largest population cohort.

Figure 12: Age Pyramid for Harper District, 2018

Age	Male	Female	Generation
85 years and over	3,878	7,621	Silent Generation (1928-1945)
80 to 84 years	5,063	6,581	
75 to 79 years	6,169	8,852	
70 to 74 years	9,022	11,233	
65 to 69 years	12,475	14,514	Baby Boomers (1946-1964)
60 to 64 years	17,015	18,197	
55 to 59 years	18,357	19,363	
50 to 54 years	18,567	19,726	Generation X (1965-1980)
45 to 49 years	18,114	18,673	
40 to 44 years	17,804	16,571	
35 to 39 years	19,196	17,927	Generation Y (1981-1996)
30 to 34 years	20,279	20,025	
25 to 29 years	17,610	16,677	
20 to 24 years	12,575	11,717	
15 to 19 years	16,238	13,381	Generation Z or Millennials (1997-)
10 to 14 years	16,706	16,824	
5 to 9 years	17,495	16,179	
Under 5 years	16,935	16,650	

Working Age (bracket covering 15 to 19 years through 60 to 64 years)

Source: U.S. Census Bureau, American Community Survey, 2018 Five Year Data.

Education Attainment

Most residents in the Harper district (age 25 and older) hold an Associate degree or higher, 60.0% or 227,741 people. This percentage is much higher than the Illinois percentage which is 42.1%. The Lumina Foundation estimates statewide percentages for "high-quality certificates" that lead to markedly increased wages. It is estimated that 6% of Illinois residents classified as have some college, no degree completed such a certificate. That percentage could be higher in the Harper district, but data are not available at the district level. The pie chart in Figure 13 shows the estimate for high-quality certificate holders being 22,776 residents if we use the Lumina estimate to extrapolate the number of certificate holders in the district.

Figure 13: Harper District Resident Population Education Attainment (Age 25 and older)
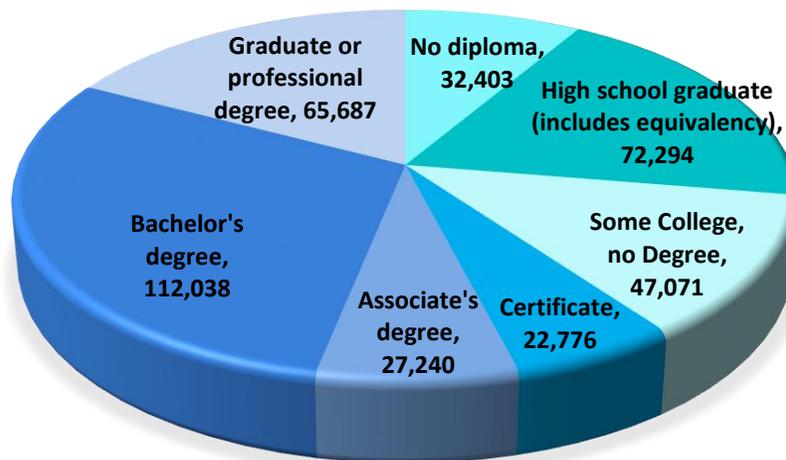
Source: U.S. Census Bureau, American Community Survey Five Year Data.

Certificate holders can often step into high skill and high wage careers without a large student debt burden. Such programs also provide opportunities for older workers who want to advance or change their career. Colleges can offer professional development through certificate programs that are attractive to those in fields that hold certificate completion as evidence of qualification or to meet continuing education requirements. The top paying job requiring such a certificate is

web developer with a median income of $69,430 per year and job growth of 13% through 2028 nationally[6].

Due to population differences of residents in each of the sender districts, Figure 14 shows the educational attainment of the residential population from 2012 to 2018. Residents not holding a higher education credential decreased in all three categories: no diploma, high school graduate or GED, and those with some college, but no degree (except in Barrington where the percentage grew from 9.1% to 9.2%). However, residents holding a credential increased in all categories except for Barrington 220, where the percentage of residents holding an Associate's degree decreased from 5.7% to 5.2%, while the percentage holding a Bachelor's degree or higher increased.

Figure 14: Percent of Residential Population Education Attainment by Sender District, 2012-2018

Legend:
- No diploma
- High school grad or GED
- Some college, no degree
- High-quality Certificate holder
- Associate's degree
- Bachelor's degree
- Graduate or professional degree

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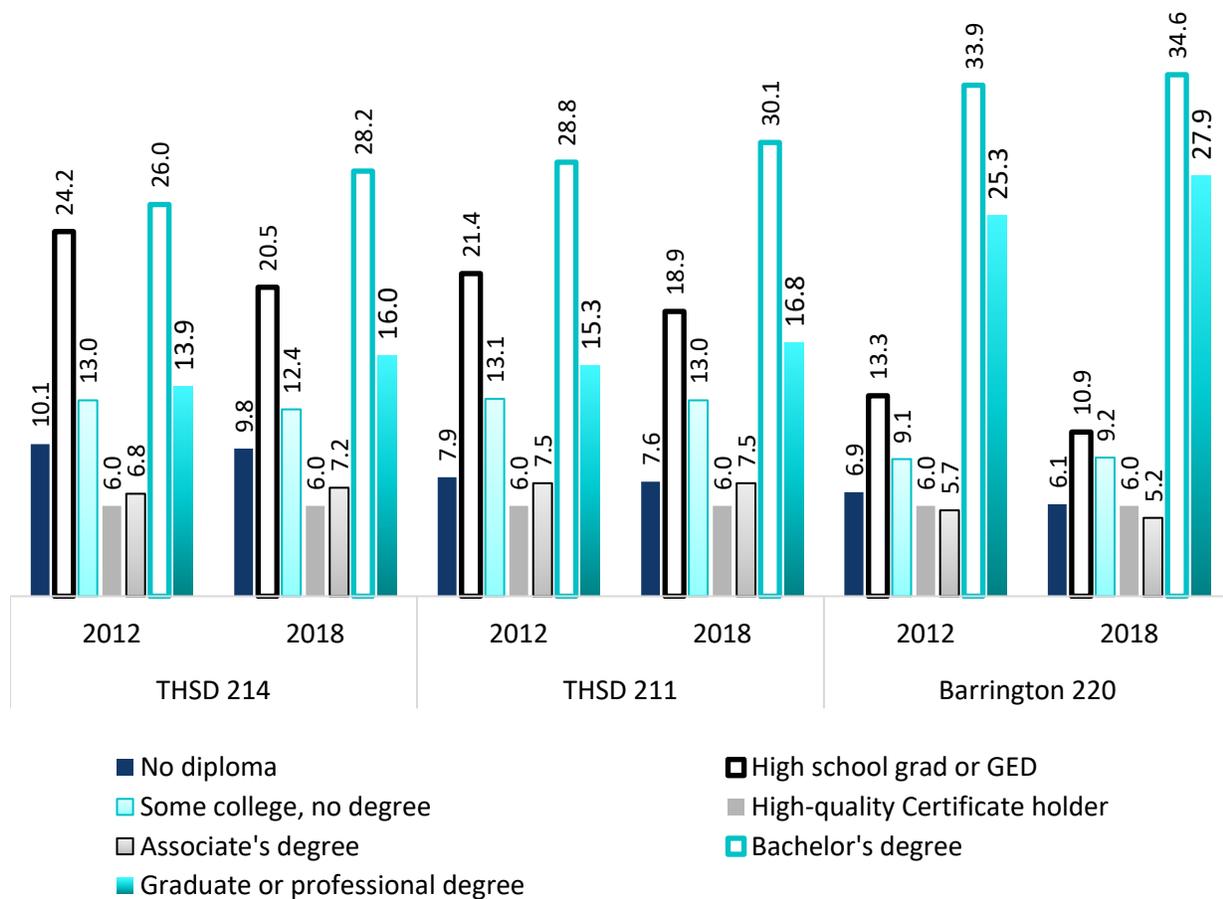
[6] O*Net Online. Accessed online: https://www.onetonline.org/link/summary/15-1134.00.

Research on the relationship between life-long earnings and educational credentials is well established. The higher the credential the higher the lifelong earnings, which has important implications for a sustainable personal retirement as well as for payroll taxes that support state-funded services in the region. Earnings typically increase as we age, and median earnings will peak among those aged 55 to 59. Figure 15 shows the gradual progression of increased earnings over a lifetime of employment until age 55, when some retire early, causing a drop the median. Education levels higher than a Bachelor's degree are not included in this calculation due to the wide variation among earnings at those levels. However, higher education levels lead to higher long-term earnings.

Figure 15: National Median Earnings by Education Level and Age, 2013-2017
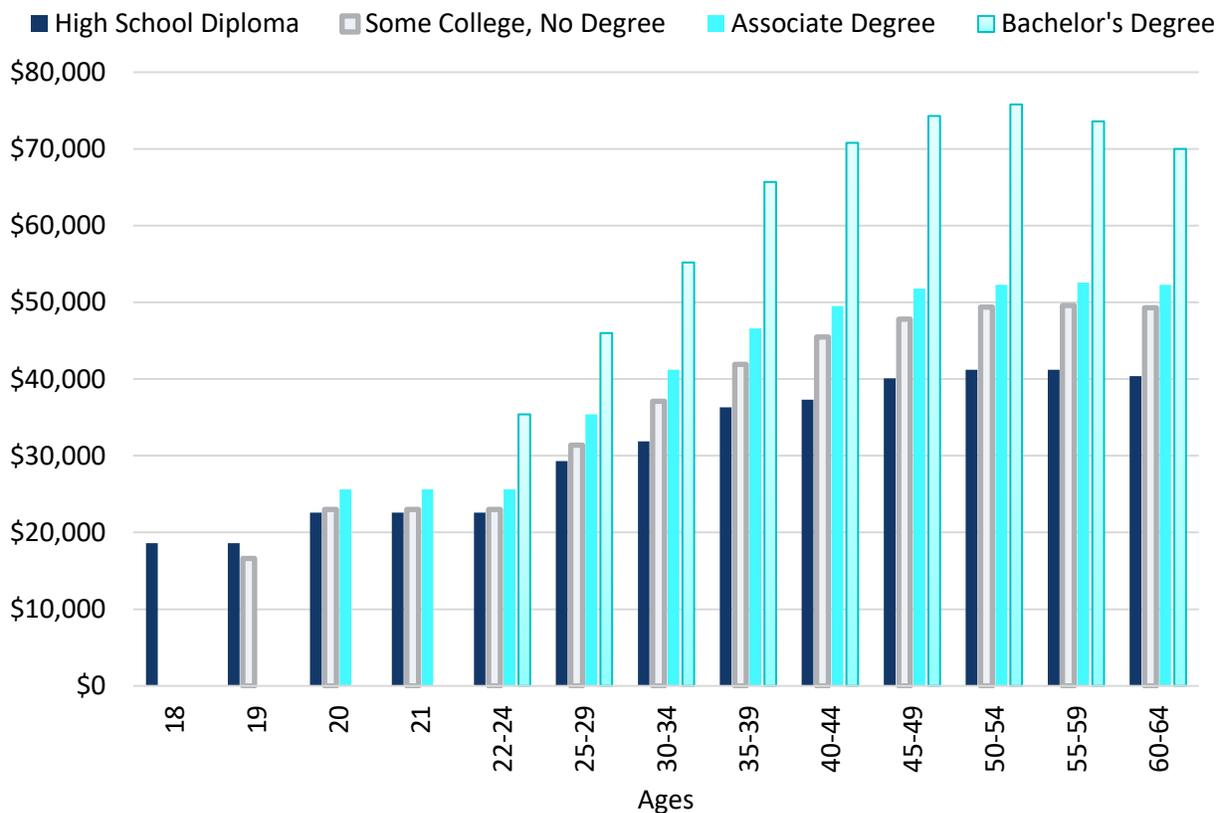
Source: U.S. Census Bureau, American Community Survey, 2013–2017 Five-Year Public Use Microdata Sample; College Board, Trends in College Pricing, 2019; calculations by the authors of Education Pays 2019.

Earnings by Education Level and Gender

The earnings by education level and gender highlight the difference in earnings. Figure 16 and Figure 17 show the median earnings by educational level and gender for Illinois and Harper district, respectively. Workers in Illinois aged 25 and over have a median income of $41,863 in earnings. However, women make just over $16,000 less than their male counterparts. This gender pay gap persists at every education level and once reaching a graduate or professional degree that gap is over $30,000.

Figure 16: Illinois Median Earnings by Education Level and Gender
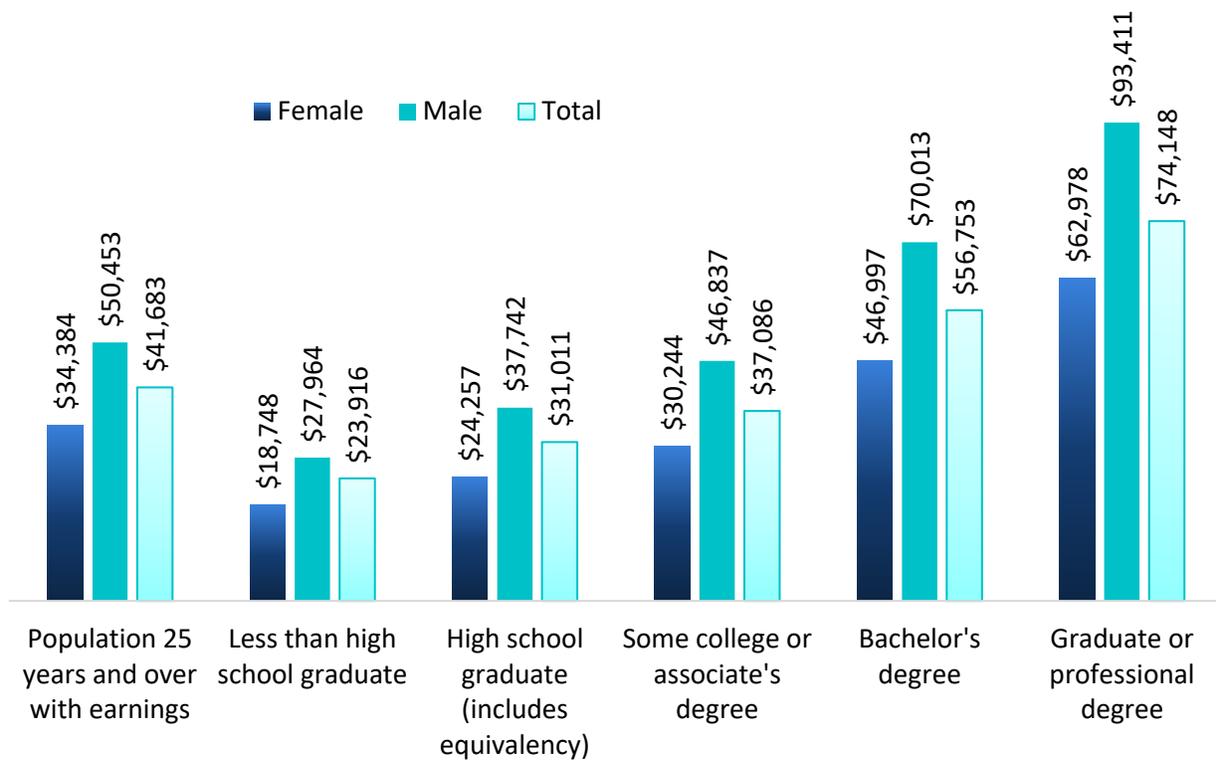
Source: U.S. Census Bureau, American Community Survey, 2018 Five Year Data.

In the Harper district, the discrepancies are even more noticeable since the incomes are generally much higher. There is an $83,597 median wage gap between males and females that are age 25 years and over. The gap starts at $32,745 for those without a diploma up to a whopping $130,793 gap between men and women with a graduate or professional degree.

Figure 17: Harper District Median Earnings by Education Level and Gender
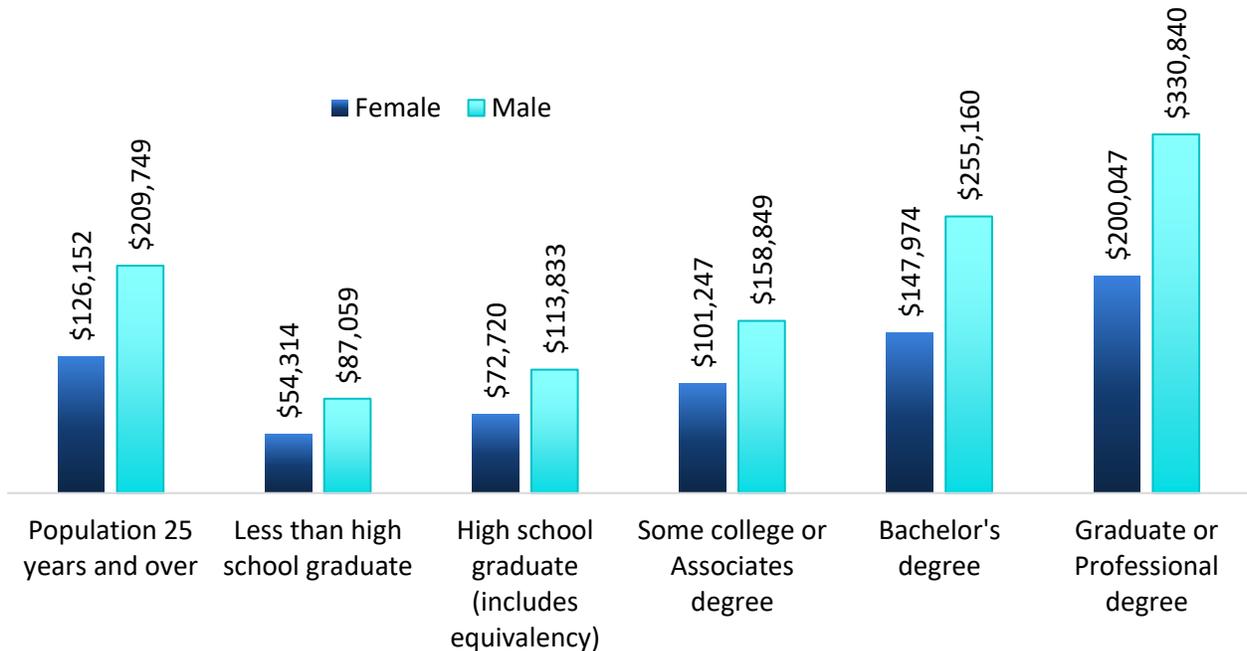
Source: U.S. Census Bureau, 2018 American Community Survey Five Year.

According to the Pew Research Center, there are many reasons for the gender pay gap. Mothers, more so than fathers, experience interruptions in their careers to care for children or another family member. Figure 18 shows the result of a Pew Research survey to help identify differences in career interruptions.

Figure 18: Percentage of Mothers & Fathers with Career Interruptions
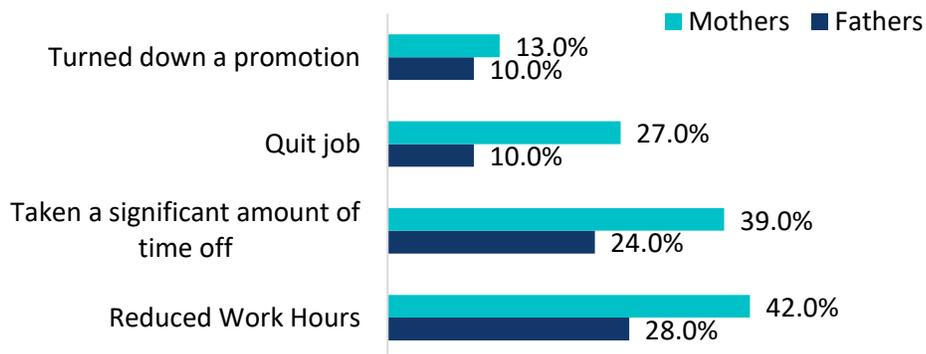
Source: Pew Research Center, Survey of U.S. Adults Conducted October 7-27, 2013.

The Harper residents have higher median earnings in comparison to the national figures, especially when looking at the upper levels of education. Earnings for Harper residents with a Bachelor's degree, among all ages, range from $59,431 to $75,859 (Figure 19). Earnings are generally higher for residents in the Barrington school district than in the other sender districts, particularly for those with a Bachelor's degree or higher. The evidence shows the Harper district residents have higher levels of earnings and education than most in the country.

Figure 19: Median Earnings by Education Level in Harper Sender Districts, 2018
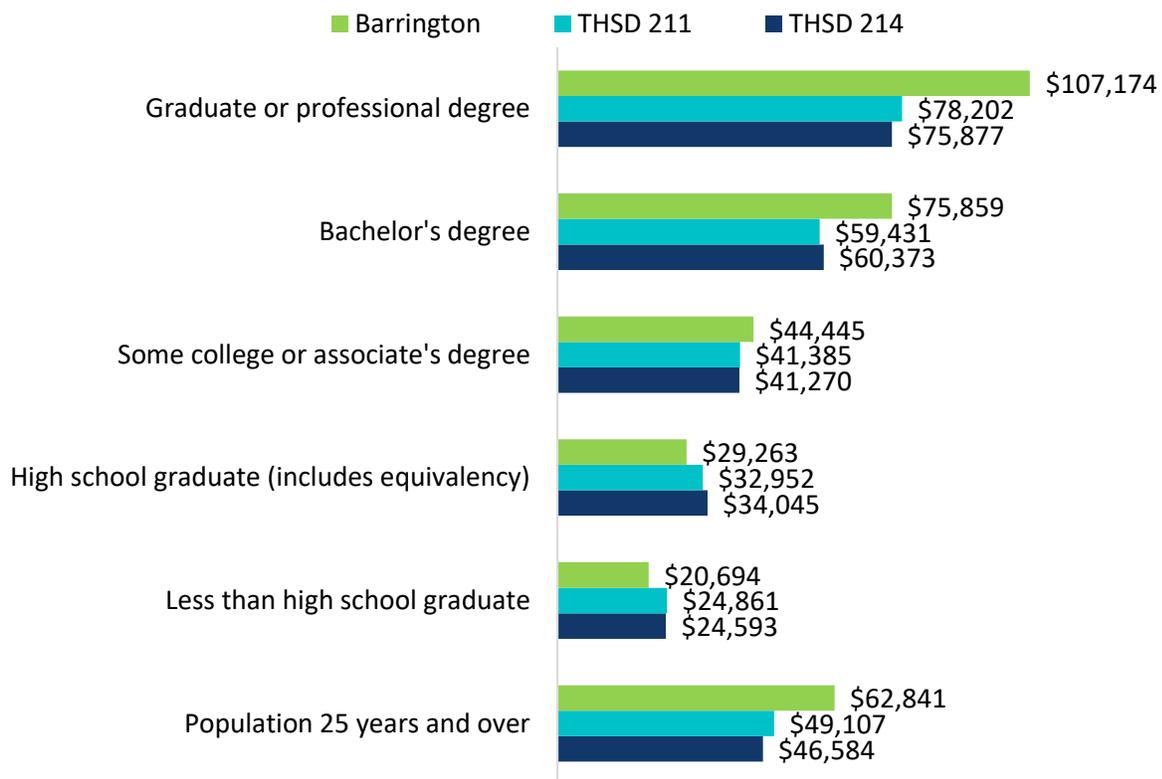
Source: U.S. Census Bureau, American Factfinder Five Year Data, 2018.

The change in educational attainment since 2012 has been positive. Figure 20 shows the change in each educational category and the number of residents who have achieved a higher level of education, including the estimate of those possessing a high-quality certificate.

Figure 20: Change in Education Attainment in the Harper District, 2012-2018

	THSD 214	THSD 211	Barrington 220	Total
Population Change (25 years and over)	5,220	6,290	1,012	12,522
No diploma	-12	7	-173	-178
High school graduate (includes equivalency)	-5,390	-2,776	-604	-8,770
Some college, no degree	-480	717	136	373
High Quality Certificate holder	1,027	549	-85	1,491
Associate's degree	313	377	61	751
Bachelor's degree	5,280	3,919	571	9,770
Graduate or professional degree	4,483	3,497	1,046	9,026

Source: U.S. Census Bureau, American Community Survey Five Year Data.

Demographics Conclusion

The Harper region has maintained population levels but is certainly changing. The region has been impacted by the residents leaving the state and new residents moving in. The residential population is becoming older, more educated, and more diverse. Birth rates are declining while death rates continue to rise. The area is becoming more racially and ethnically mixed as the White population shrinks and is replaced by Asian, Other Races, and Latinx residents. The current population is more linguistically diverse, speaking a wider range of primary and secondary languages. These demographic trends are not anticipated to reverse course in the near future.

Economic Trends

National Economy

The national economy has recovered from the Great Recession as unemployment rates reach record low numbers and Wall Street continues to rise. Upper income levels have recovered their household net worth lost in the Great Recession, while both the middle and lower income classes continue struggling to return to pre-recession income. Figure 21 shows the progression from 2007 (pre-recession) to 2013 where all three categories experienced a decline. By 2016, the upper income level recovered their 2007 median income of $740,100 and gained an additional $70,700 annually. In comparison, the middle class lost $53,200 and the lower class lost $7,700 from 2007 to 2016. The disparity between lower- and middle-income households and upper-income households continues to grow. There remains a significant gap not just in recovering from the economic crisis, but in being sustainable to support a family for the lower- and middle-income categories. The median household income is $61,937 for the nation and Illinois is slightly higher at $62,992.

Figure 21: National Median Household Net Worth by Income in 2016 Dollars

Lower	2007, $18,500
Lower	2013, $9,600
Lower	2016, $10,800
Middle	2007, $163,300
Middle	2013, $99,500
Middle	2016, $110,100
Upper	2007, $740,100
Upper	2013, $659,300
Upper	2016, $810,800
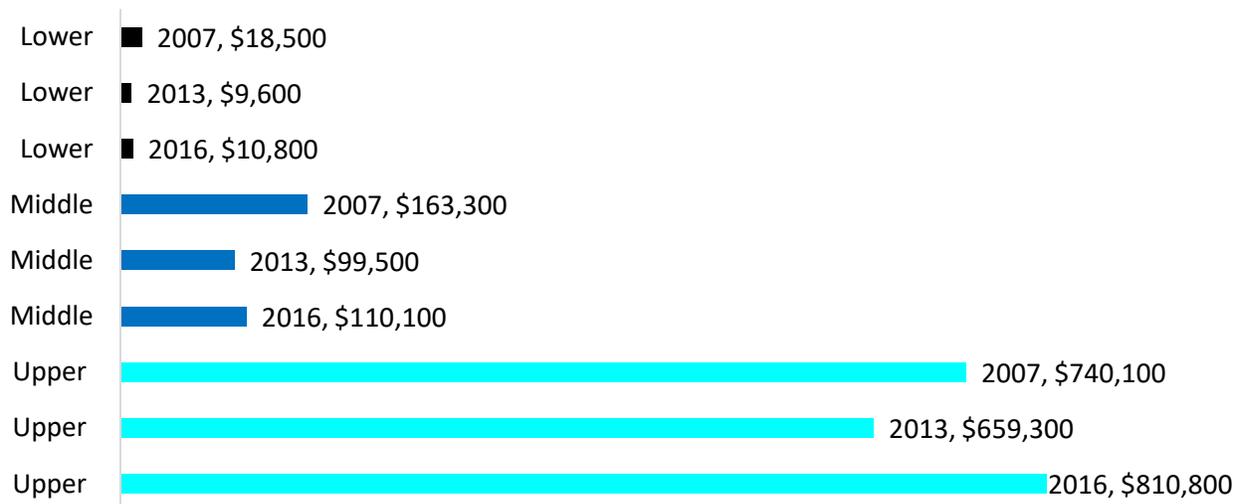
Source: Pew Research Center.

Note: The measure in Figure 21 is the median household income – that is, the point at which half of the wage earners are above the indicated income and half are below. Median income is used to minimize the impact of any high or low outliers that may skew the data.

Employment in Cook County recovered from the Great Recession (2008-2009) losses by 2015 and has continued to increase since exceeding the previous high (2001) by 2018. Events of September 11, 2001 and the Great Recession had large impacts on employment and wages, creating a slow recovery period throughout Cook County. May 2018 is when employment finally reached the December 2000 peak in Cook County.

Figure 22: Cook County Annual Average Employment (non-farm industries)
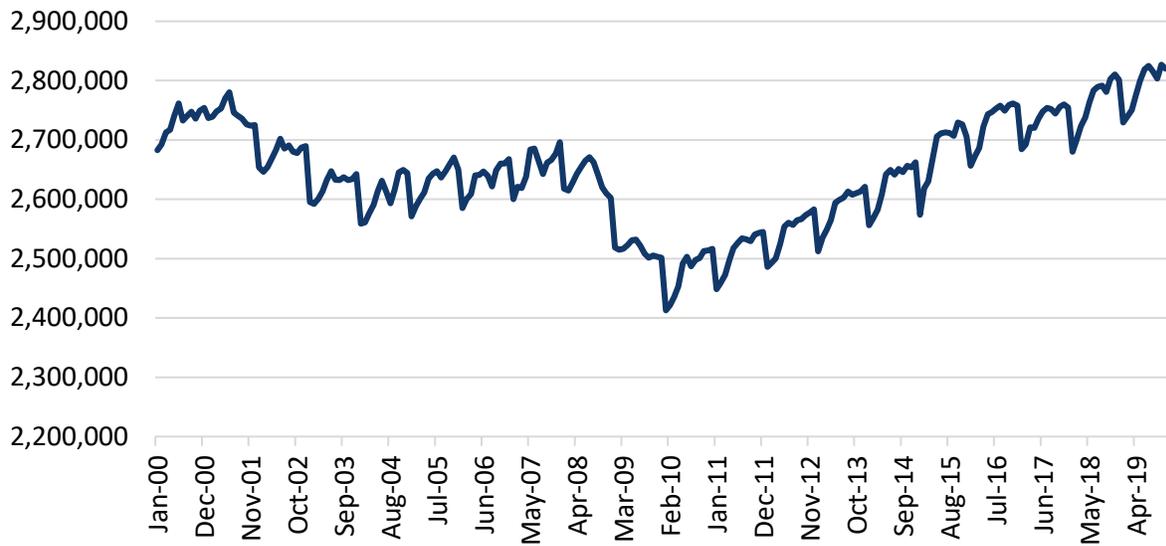
Illinois tends to have a lower Gross Domestic Product (GDP)[7] than the nation. However, the nation has not been reaching the anticipated 3.0% annual growth as expected and Illinois struggles to reach 2.0%. The 2017-2018 year has been the best growth in Illinois since the 2005-2006 fiscal year. Hopefully, this is the beginning of a new trend and not a blip in time.

Figure 23: U.S. and Illinois Change in Annual Gross Domestic Product, 2004-2018
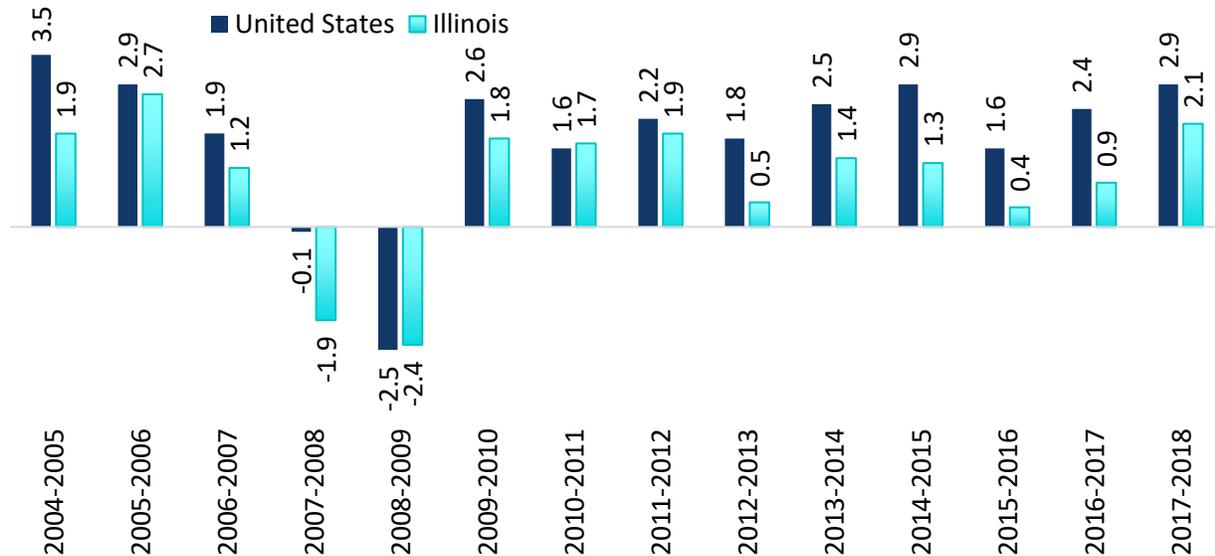
Source: Bureau of Economic Analysis.

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[7] Gross domestic product (GDP) is a measure of a country's economic output. GDP per capita and GDP per employed person are related indicators that provide a general picture of a country's well-being. GDP per capita is an indicator of overall wealth in a country, and GDP per employed person is a general indicator of productivity.

Gasoline Prices

Transportation costs dictate to a degree the distances that people are willing to commute to work or attend school. Fortunately, since the price spikes earlier in the decade (2011-2013), partially due to the Deepwater Horizon tragedy, gas prices on average have declined considerably. These trends have been consistent throughout Illinois and the nation. If prices remain stable and relatively low, the cost of commuting will remain lower and affordability becomes less of a constraint than when gasoline prices are high (See Figure 24).

Figure 24: Chicago Area Average Gasoline Prices 2010-2019

Source: http://www.gasbuddy.com.
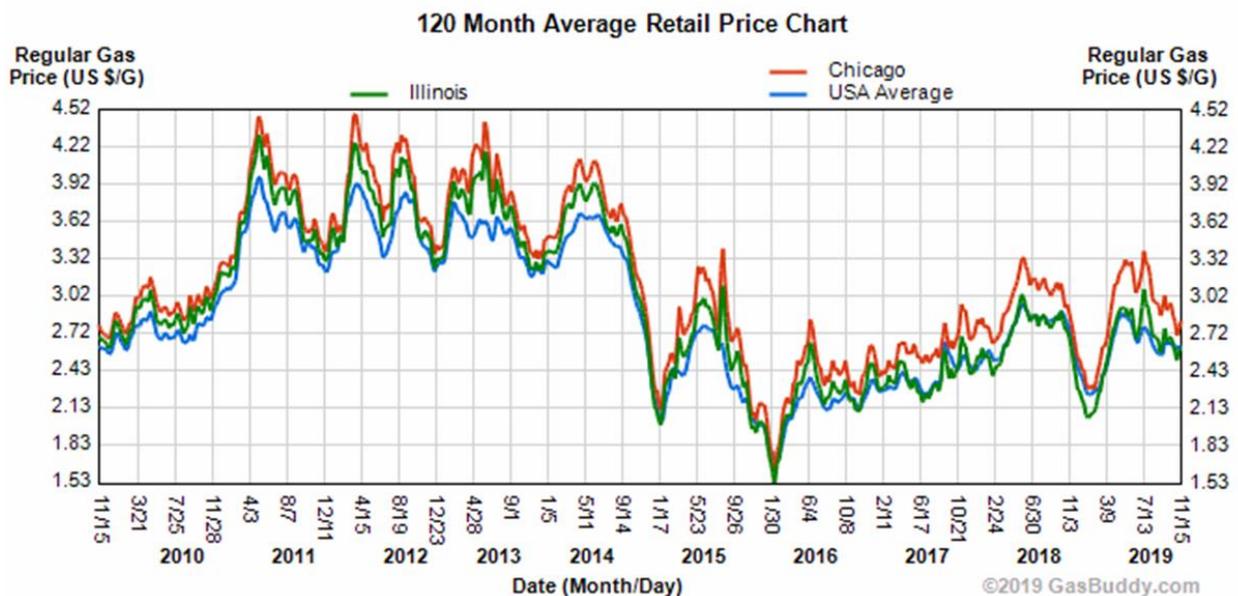
Impact of Illinois Pensions & Taxation

Illinois, and the local governments within, have been making incremental changes to shore up their public pension systems. Most recently was the consolidation of small local police and fire funds in Chicago, which will help, but only minimally. The state retirement system has increased the retirement age which will help bring down future costs. The impact of solutions, or lack of solutions, to the pension crisis will result in additional costs to taxpayers and institutions alike. To stem the tide, the Illinois income tax has been raised

Figure 25: Illinois Income Tax History

	Individual	*Corporate*
FY2018	4.95%	7.0%
2015	3.75%	5.25%
2011	5.0%	7.0%
1990	3.0%	4.8%
1989	2.75%	4.8%
1985	2.5%	4.8%
1984	2.75%	4.0%
1983	3.0%	4.8%
1969	2.5%	4.0%

Source: Illinois Department of Revenue

twice, in FY2011 and again in 2018. The current individual income tax rate sits at 4.95% and the corporate tax is at 7.0%, the highest rate over the course of history. Figure 26 shows the combined unfunded liability of the State Retirement Systems, which continues to grow unabated.

Figure 26: State Retirement Systems Combined Unfunded Liability History ($ in Billions)

Source: State Higher Education Executive Officers Association.

The decline of Illinois' bond ratings (Figure 27) will require the State to pay higher interest on its borrowing. The current ratings for Illinois general and special obligation bonds have improved but continue to show low ratings and a negative outlook by Fitch on Special Obligation bonds. Although credit agencies vary in their ratings, a Aaa rating is generally considered prime, with lesser ratings qualifying borrowers for high grade, upper medium grade, and lower medium grade interest rates. As interest payments consume a larger share of State revenue already, the availability of funds for other priorities, such as education, will continue to decrease. As a result, institutions of higher education are having to cut costs and raise other sources of revenue, including tuition and fees, to cover the shortfall.

Figure 27: 2020 Illinois Bond Ratings

	Fitch Ratings	Moody's Investors Service	Standard & Poor's
General Obligation	Bbb Stable Outlook	Baa3 Stable Outlook	Bbb- Stable Outlook
Special Obligation	Baa3 Negative Outlook	Bbb Stable Outlook	A- Stable Outlook
Source: Illinois Comptroller's Office, 2020.			

The Harper district has been able to maintain their Aaa bond rating issued by Moody's when Community Colleges were rated starting in 2001. The Aaa is the highest possible rating and provides evidence of financial strength moving forward. Despite the State's poor financial status, which had a negative impact on all state institutions, including the community college system, Moody's has upgraded Harper to a Stable Outlook. Unlike the State of Illinois, Harper College will be able to obtain lower interest rates, reducing the cost of its borrowing, and, due to the state paying down some of its debt, the outlook has improved.

Higher Education Enrollment

Illinois higher education experienced a decrease of 16.7% in total full-time equivalent (FTE) enrollment from 2013 to 2018, the third largest drop behind Alaska (-17.1%) and New Mexico (-17.3%). Nationally, there has been a drop as well, but only -3.3%. Since the Great Recession in 2008, Illinois has the highest overall loss of FTE at -13.3% (see Figure 28). The loss in enrollments is not expected to reverse any time soon as the rate of loss is continuing to increase along with overall population counts. The states showing an increase in higher education enrollments have recovered and are expanding, while the upper Midwest continues to lag.

Figure 28: Change of Full Time Enrollments Lost Since the Great Recession, 2008-2018
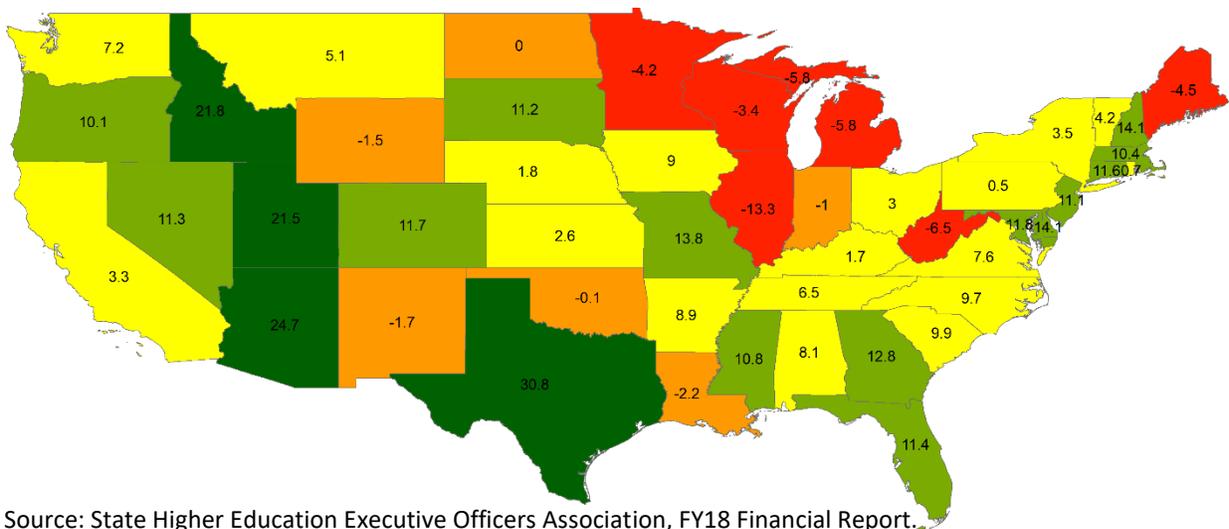
Source: State Higher Education Executive Officers Association, FY18 Financial Report.

Higher Education Funding

Looking at higher education finance a very different picture emerges. Illinois had the highest percentage increase in state funding appropriated for higher education in 2018, but most of that funding went to shoring up pensions that were underfunded for many years. Facing further declines in bond ratings and the inability to raise enough revenue in short order, a much greater portion of the Illinois budget has gone towards pensions since the Great Recession. Most states did not increase funding in this period, in fact, many decreased funding by rather large amounts. Only five states increased funding, with Illinois and North Dakota having the greatest increases and Illinois is almost twice the North Dakota increase.

Figure 29: Higher Education Funding by State Since Great Recession, 2008-2018
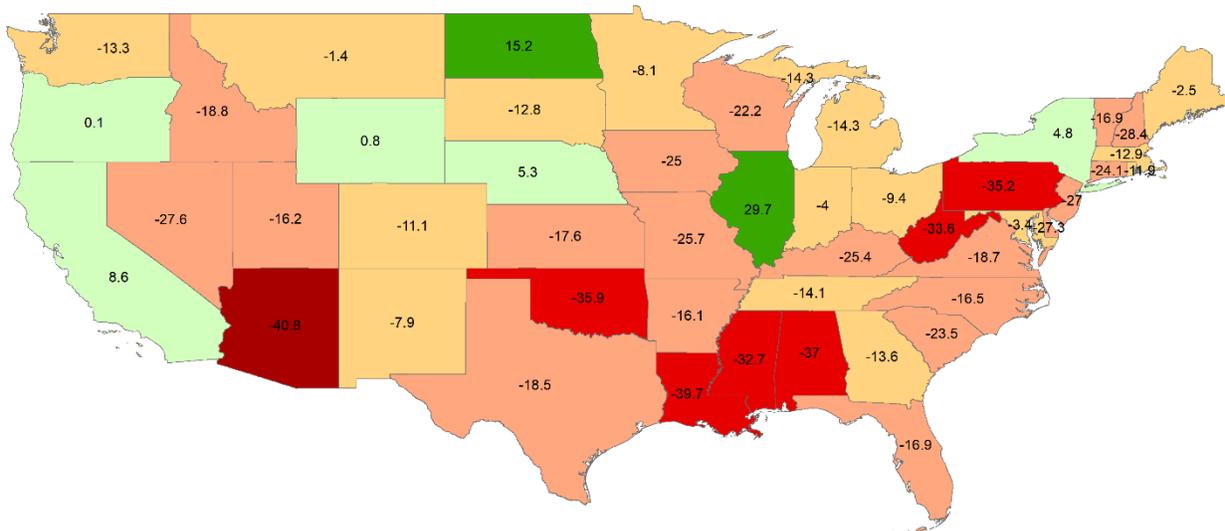
Source: State Higher Education Executive Officers Association, FY18 Financial Report.

Inflation

The Consumer Price Index (CPI) is a measure utilized by the Bureau of Labor Statistics to track changes in the buying power of the dollar across the nation and in selected metropolitan areas. The CPI is based on a monthly price survey of goods and services. The percentage change in the price of these goods and services over time determines the inflation rate.

Figure 30 illustrates the average annual CPI since 2000. The recession in 2008-2009 can be easily identified, with the CPI resuming an upward trend in 2010 and continuing through 2018. Modest growth in the CPI is tolerable if income keeps pace and the overall buying power of consumers is not significantly impacted. Lower inflation does not necessarily encourage saving or investments but does make it easier for individuals and households to maintain or improve their standard of living.

Figure 30: Annual Average CPI (Unadjusted)
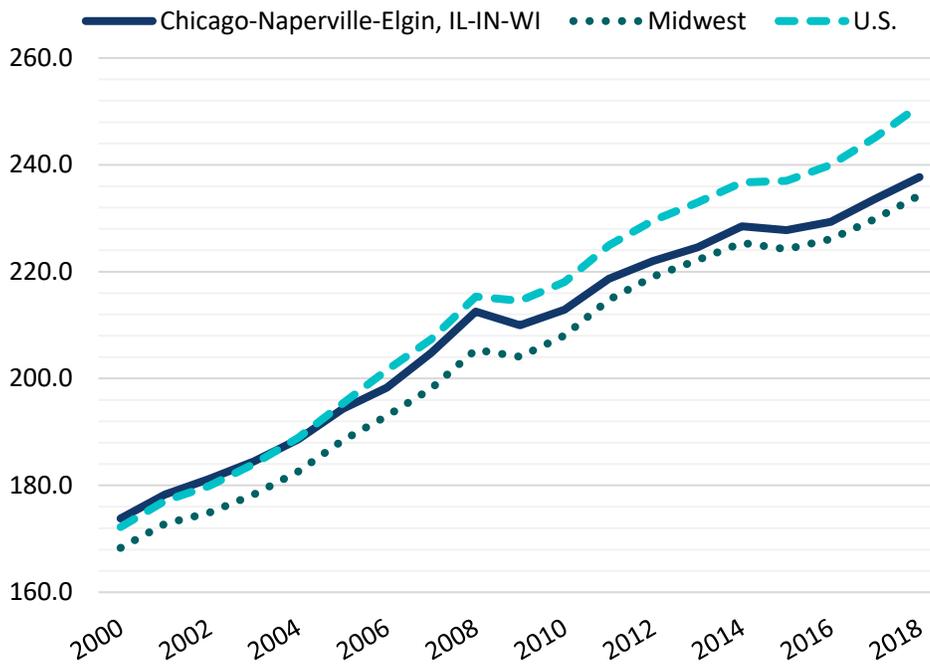
Source: U.S. Bureau of Labor Statistics.

Economic Conclusion

The Illinois economy is still recovering from the last recession when compared to the expansion occurring in the other states. Cook County employment took 18 years to return to the previous high employment level reached in December 2000, before September 11, 2001 and the Great Recession. The GDP has been slow to recover and is slower to recover in Illinois than the nation. Gasoline prices have remained steady in the last several years, which is a good sign for those who commute to Harper. The increased funding to higher education institutions by Illinois doubled the second highest increase in North Dakota. However, the funds were earmarked for pensions rather than operational revenue. Enrollment in Illinois has been on the decline since the Great Recession, a loss of 13.3%. Enrollment declines have occurred in most of the upper Midwest states, but Illinois has experienced the greatest decline in the country.

Sender Districts Performance

Students graduating from the three sender districts, Barrington USD 220, Township High School District 211 and Township High School District 214 are the primary sender districts to Harper College. The high school districts are high-performing districts in comparison to statewide averages. Enrollments are holding steady while declining throughout the state, but diversification is a statewide phenomenon leading to minorities becoming the majority in many of the early grade levels.

Public School Enrollments

Public school enrollments in the Harper district remain steady. Public school enrollments throughout Illinois have been declining, due in large part to the decrease in children being born and entering the school system. Domestic migration of families out of Illinois has also contributed to this decrease in enrollment. Statewide, public school enrollment declined by 2.2%. In comparison, schools in the Harper district (elementary,

Figure 31: Public School Enrollments

Source: Illinois State Board of Education, Report Card.

middle and high school) declined by just 0.3%, or 254 students, since 2017. A similar trend is seen in the high schools, which started with an enrollment of 32,620 in 2017 and fell to 32,535 in 2019, a drop of only 0.03%. Because a majority of those leaving Illinois are of parental age, the decline in school enrollments is anticipated to continue throughout the state.
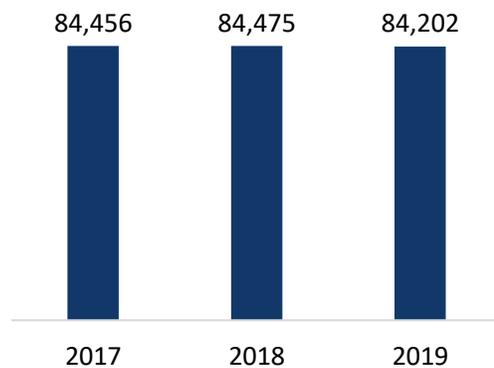
Student Demographics

The diversity in the local school system reflects the diversity in the general population. The public schools in Harper's district are 47.7% White, 28.7% Latinx, 15.2% Asian, 6.1% Other races or combinations, and 3.5% Black (Figure 32). It is anticipated the region will continue to diversify as more Whites move out and other races/ethnicities move in.

Figure 32: 2019 Public School Enrollment by Race & Ethnicity

Race/Ethnicity	Percentage, Count
White	47.7%, 40,066
Latinx	28.7%, 24,101
Asian	15.2%, 12,760
Other	6.1%, 5,119
Black	3.5%, 2,912
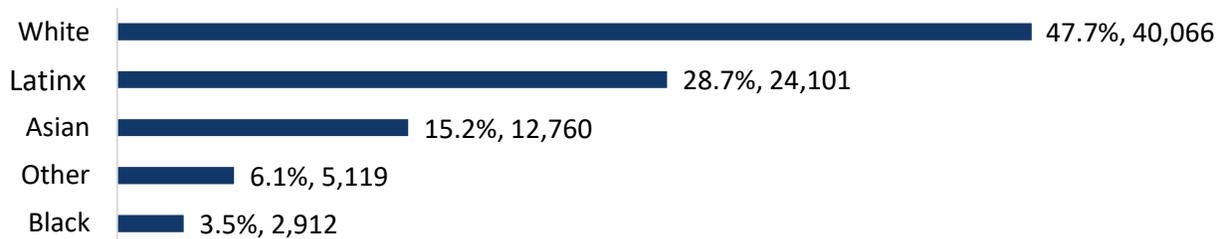
Source: Illinois State Board of Education, Report Card.

The individual school districts in the region have a wide range of diversified populations and each district has a unique combination of races. Schaumburg has a high proportion of Asians and Latinxs while the Wheeling Community Consolidated school district has the highest proportion from the Latinx community (see Figure 33).

Figure 33: Racial and Ethnic Comparison of Harper School Districts

District	Total
Schaumburg CCSD 54	14,684
Palatine CCSD 15	11,931
Township HSD 214	11,671
Township HSD 211	11,442
Barrington CUSD 220	8,300
Comm Cons SD 59	6,453
Wheeling CCSD 21	5,898
Arlington Heights SD 25	5,453
Mount Prospect SD 57	2,190
River Trails SD 26	1,547
Prospect Heights SD 23	1,510

Legend: White, Black, Latinx, Asian, Other
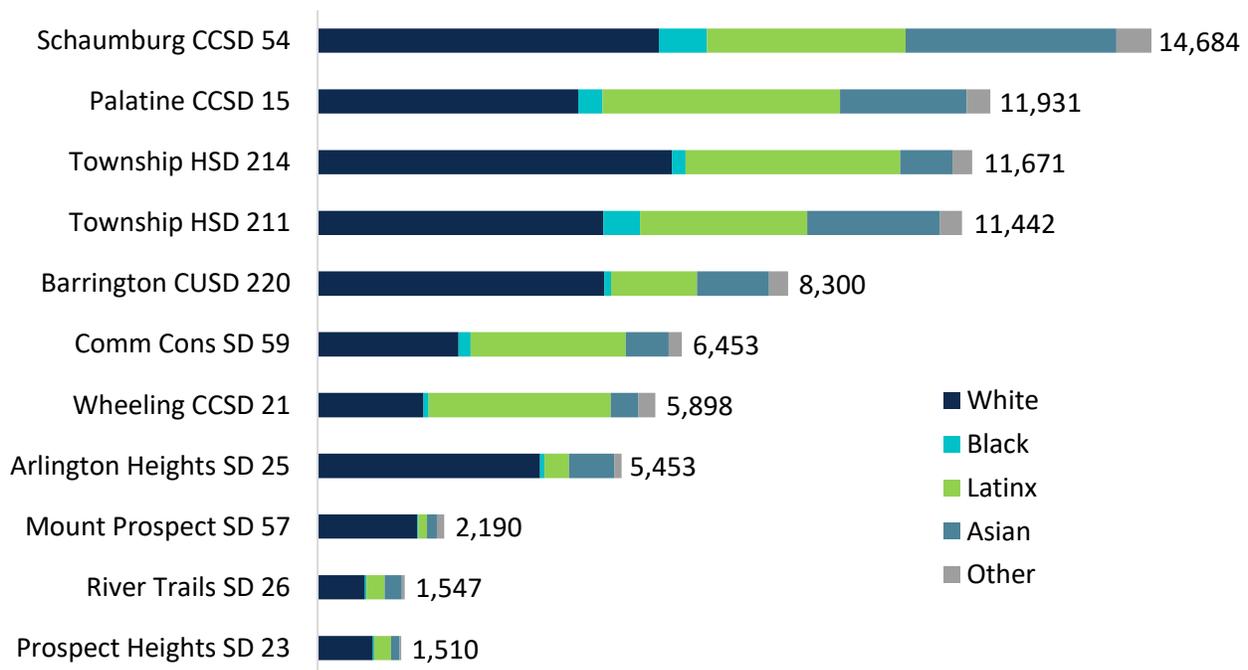
Source: Illinois State Board of Education, Report Card, 2019.

The White population is no longer the majority in several districts in the Harper region. The Wheeling School District #21 has the largest proportion of minorities at 68.7%, while Mount Prospect School District #57 has the smallest proportion of minorities at 21.3%. It is anticipated that the population in Illinois will become increasingly diverse over time; the younger the age groups, the more diversity exists.

Figure 34: Percentage of Minority Population by School District

School District	% Minorities
Wheeling CCSD 21	68.7%
Community Cons SD 59	61.3%
Palatine CCSD 15	61.3%
Schaumburg CCSD 54	59.1%
Township HSD 211	55.7%
Township HSD 214	45.9%
River Trails SD 26	45.8%
Barrington CUSD 220	39.0%
Prospect Heights SD 23	33.8%
Arlington Heights SD 25	26.8%
Mount Prospect SD 57	21.3%

Source: U.S. Census Bureau, American Community Survey, 2018 Five Year.

Student Attendance

Most of the high school districts raised their attendance rates significantly in 2019. The Township HSD 214 saw the greatest increase from 91.7% in 2018 to 95.5% in 2019. All Harper districts are over the state average of 94.0% in 2019. Having a high attendance rate is an indicator of the student's ability to succeed in their studies.

Figure 35: Percentage of Average Daily Attendance by School District
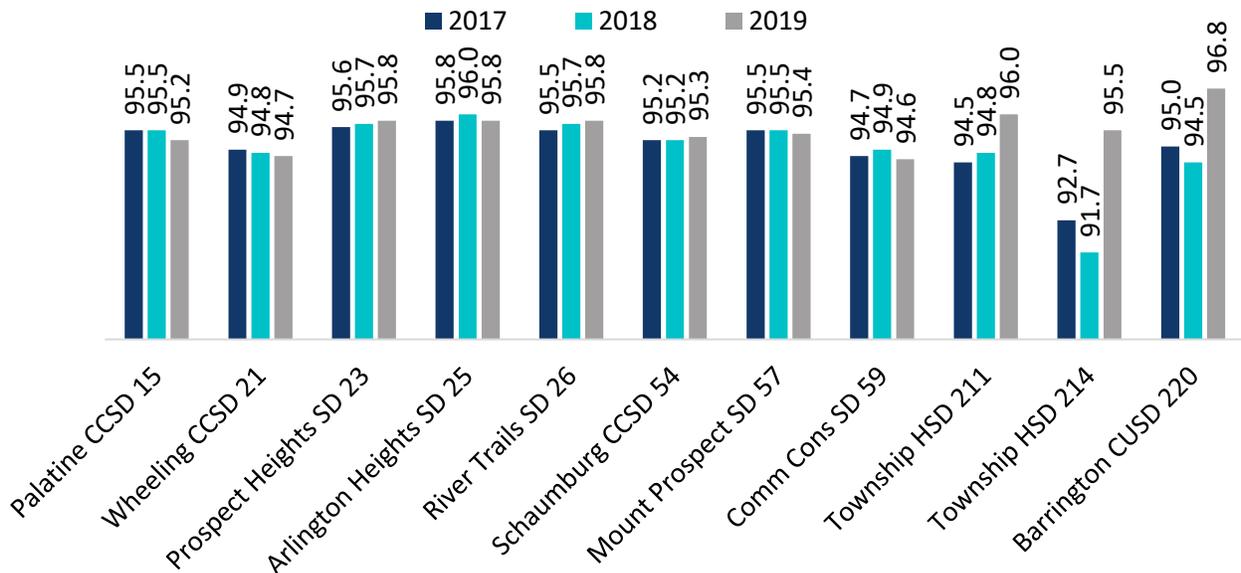
Source: Illinois State Board of Education, Illinois Report Card.

Dropout Rates

Students who drop out of high school are less likely to enroll in a college or trade school to attain skills necessary to begin a career and they are more likely to earn lower income than their graduating counterparts. Dropout rates are calculated for all high schools and include those who purposely dropped out, moved to an unknown location, transferred to a GED program, or aged out. The high schools in the Harper district have lower dropout rates than the state of Illinois. Illinois had a dropout rate of 4% in 2019 and 2% in both 2017 and 2018. The dropout rates for all Harper high school districts are well below the state average even with the 2019 increases.

Figure 36: Dropout Rates
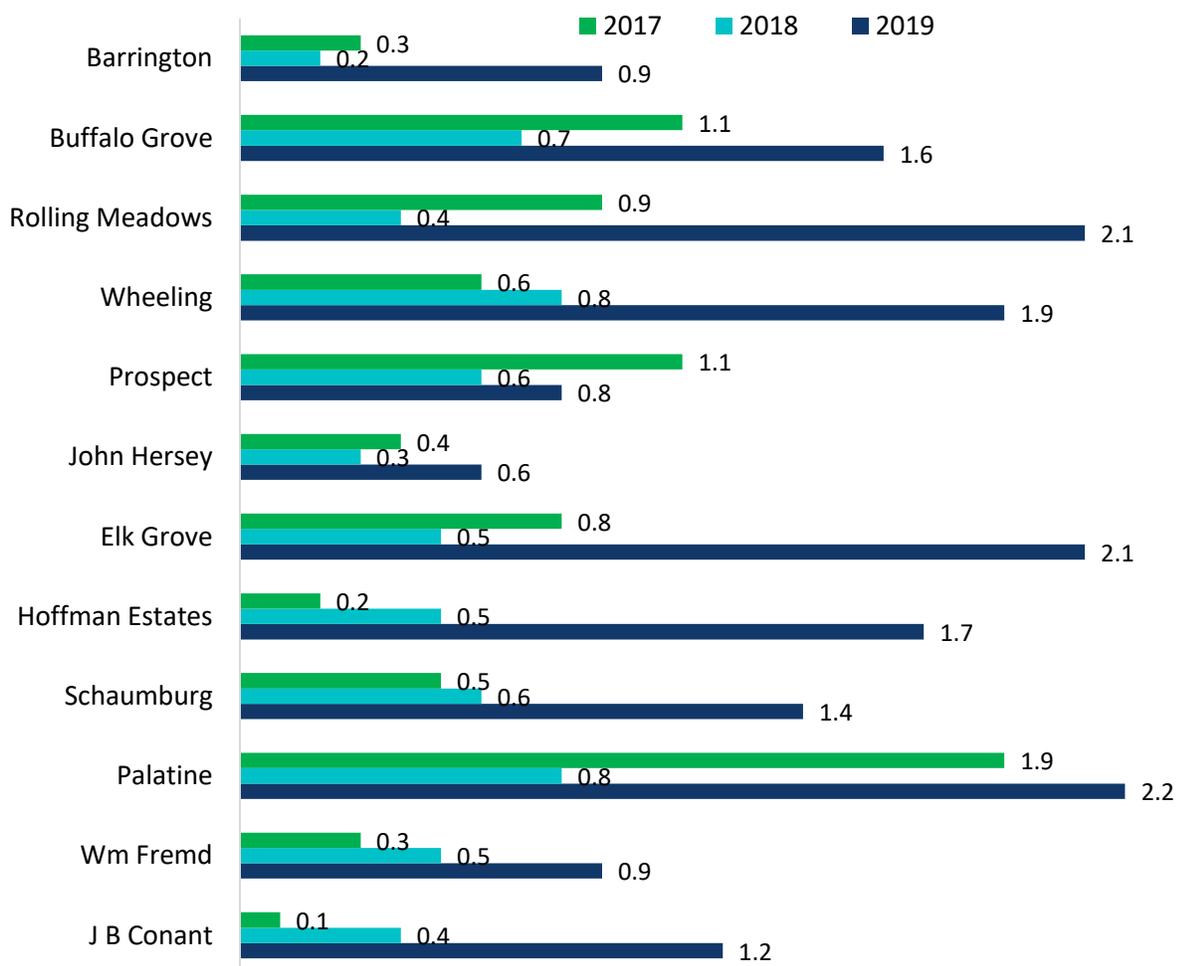
Source: Illinois State Board of Education, Report Card.

Chronic Truancy

The definition of chronic truancy is when students miss 5% or more of the total school days within a year without a valid excuse. This 5% translates to nine days for an average 180-day school year. Students who are chronically truant are more likely to be at risk of academic and behavioral problems. Research shows that chronic truancy has been linked to serious delinquent activity in youth and to significant negative behavior and characteristics as adults[8]. Truancy rates at the high schools in in the Harper's district have remained well below the state average.

Figure 37: Chronic Truancy
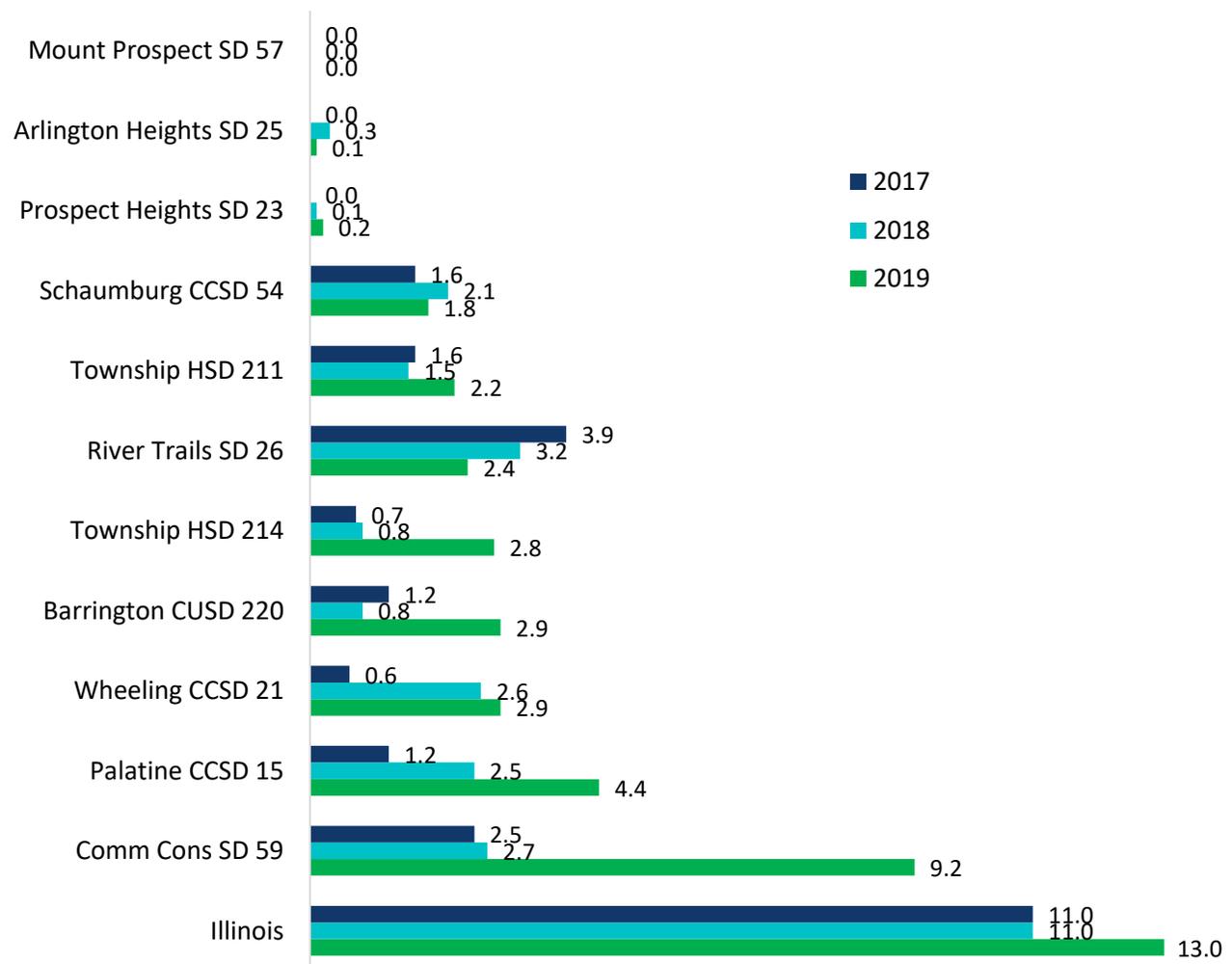
Source: Illinois State Board of Education, Report Card.

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[8] Statements from https://www.illinoisreportcard.com.

Mobility

The mobility rate is defined as the percentage of students experiencing at least one transfer in or out of the school during the year. Duplicates are removed if a student transferred in and then transferred out to another school. There are a variety of reasons for transfers, such as a family move, changing to a different school that better suits their needs, or a period of homelessness. Continual student turnover is shown to be academically and socially disruptive to both ongoing and transferring students[9]. Mobility rates at most schools in The Harper districts are below the state average in 2019, with the only exception of Community Consolidated School District #59.

Figure 38: Mobility Rates
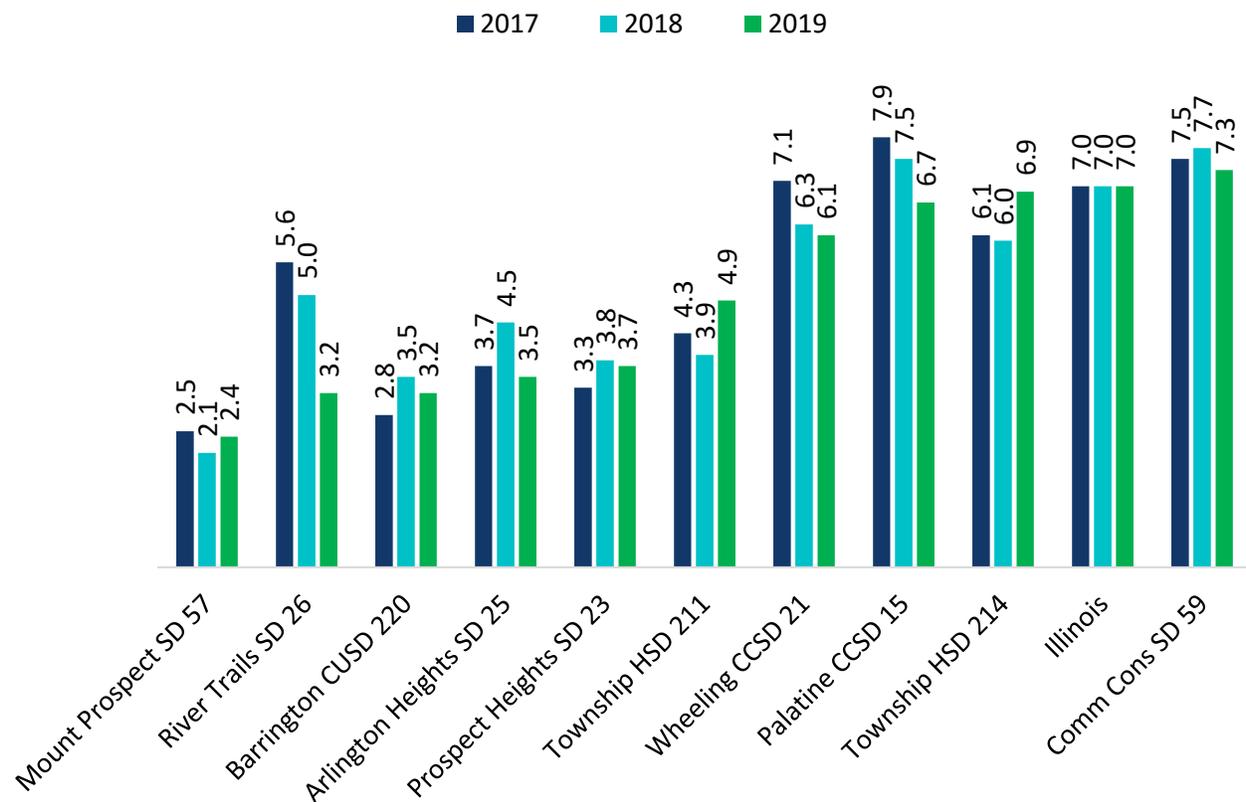
Source: Illinois State Board of Education, Report Card.

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[9] Statement from https://www.illinoisreportcard.com.

Four Year Graduation Rates

The four-year graduation rate is calculated based on federal guidelines to be consistent throughout the country. Obtaining a high school diploma within four years is vital, whether students intend to enroll in college or begin in the workforce. Ensuring that graduates are prepared is important to help them remain on a successful career track. Some of the most important factors influencing successful completion are socio-economic factors of the family, 9th grade experience in acclimating to the high school environment, attendance and engagement in school, course success, and demographics[10]. The Harper sender high schools are well above the state average, indicating higher rates of successful completion in the four-year time frame.

Figure 39: Four-Year Graduation Rates
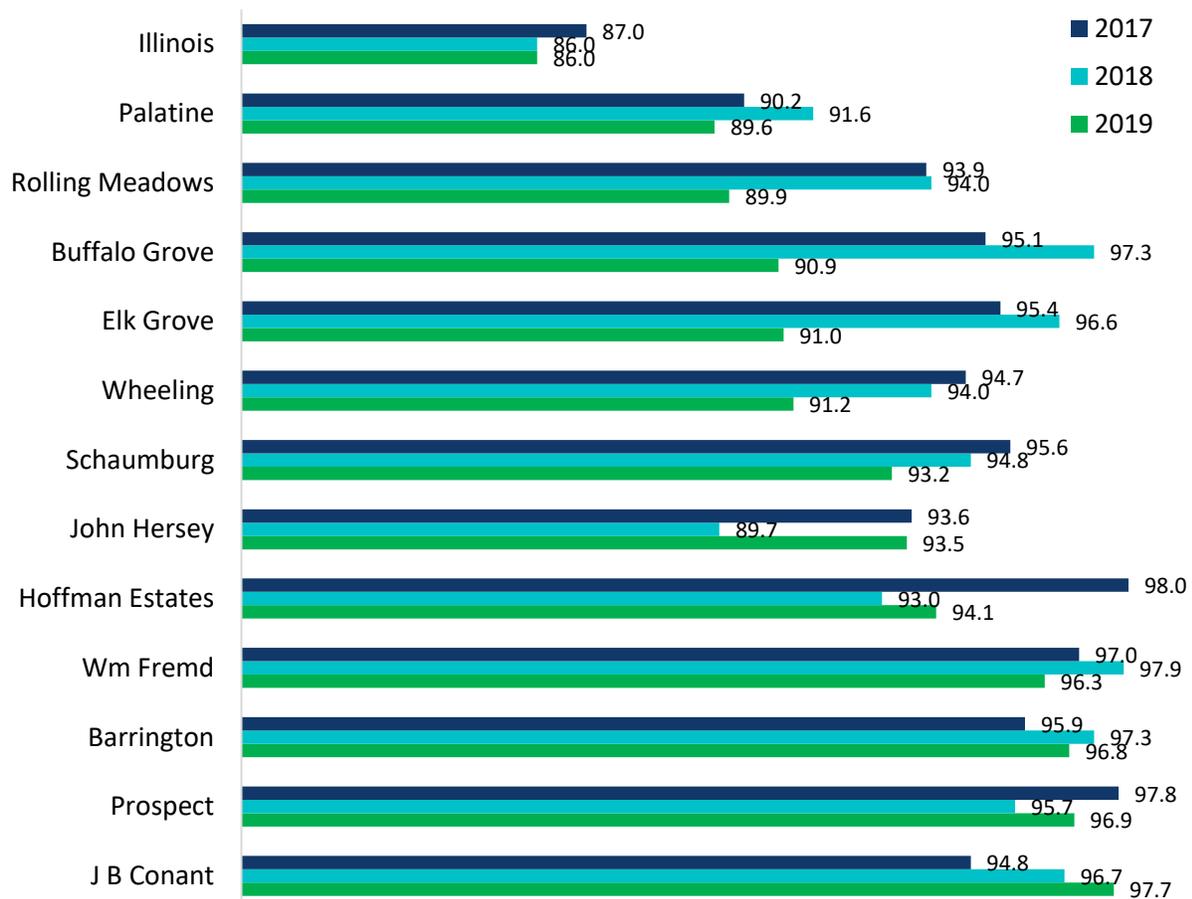
Source: Illinois State Board of Education, Report Card.

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[10] Ritter, Barbara. *Factors Influencing High School Graduation*. Washington Student Achievement Council. Spring 2015. Accessed: https://wsac.wa.gov/sites/default/files/2015.12.3.Ritter.Graduation.Issue.Brief.pdf.

Low Income Students in Primary and Secondary Schools

Students are categorized as low income if they are determined to be eligible for free or reduced lunch. Every public school is mandated to provide the free or reduced lunch program in Illinois. Students are automatically eligible if their household is receiving food stamps or Temporary Assistance to Needy Families (TANF), or if their household income falls within guidelines published annually by the U.S. Department of Agriculture. The income guidelines are adjusted by family size[11]. The school year 2018-2019 required an annual household income below $32,630 for a family of four to be eligible for free lunch, and up to $46,435 for a family of four to be eligible for reduced-price lunch. In the Harper district there are 118 schools, four of which are new schools since 2009. Out of the remaining 114 schools, 15 had a decrease, or no change, in the percentage of the student population eligible for the free or reduced lunch program. The other 96 schools experienced an increase in those eligible to participate in the lunch program, a few of them significantly. The Brentwood Elementary School increased by 29.5% and both the Dwight D

Figure 40: Percentage of Students Eligible to Participate in Free/Reduced Lunch Program, 2009
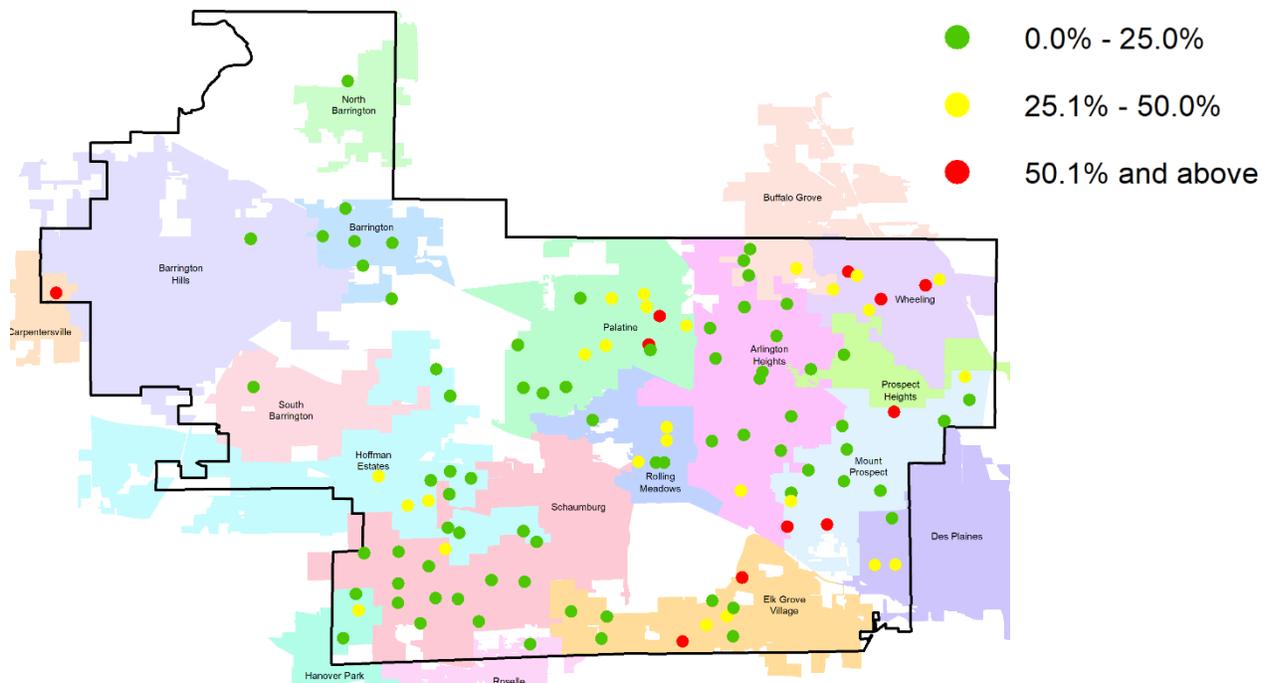
Source: Illinois State Board of Education, Report Card.

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[11] U.S. Department of Agriculture, Federal Register. Vol. 83 No. 89. Published Tuesday, May 8, 2018.

Eisenhower Elementary School and the MacArthur Middle School increased by 27.7% each. The full listing of the schools can be found in Appendix A.

Figure 41: Percentage of Students Eligible to Participate in Free/Reduced Lunch Program, 2019
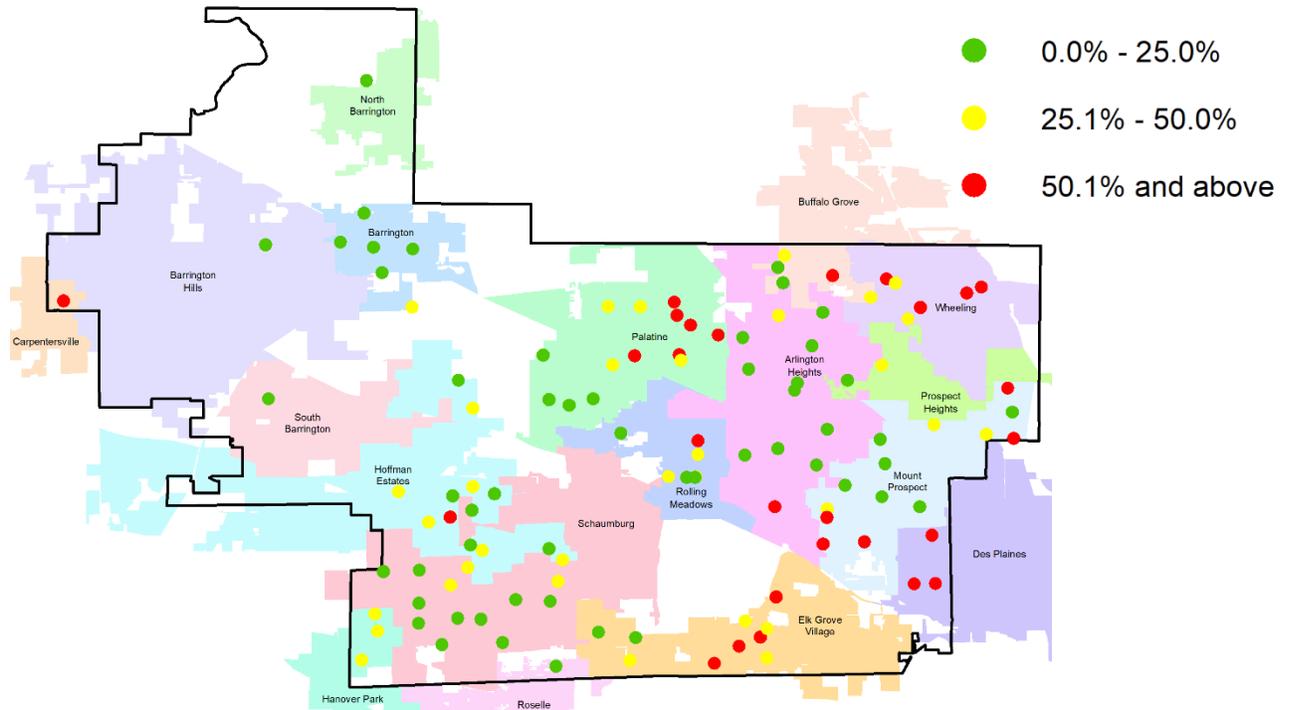
Source: Illinois State Board of Education, Report Card.

Education Financial Assistance

FAFSA Starts and Completions

Completed FAFSA applications are a way to gauge intent of high school seniors to attend college. Students are encouraged to file the FAFSA during high school, but this typically requires additional information from parents or guardians to complete the application at home. Percentages in Figure 42 are calculated for first-time filers no older than 18 who will have received their high school diploma by the start of the school year for which they are applying for aid. Percentages are provided for students who started the FAFSA and those who completed it. The statewide average for completing the FAFSA applications is 56.0% and all high schools in the Harper district have higher FAFSA completion rates. The high schools in the Harper district range from 59.2% completions at Barrington HS to a high of 76.7% completions at Prospect. High FAFSA completion rates are an indicator of schools working effectively with students to consider college and file the application. Some of the schools without a high FAFSA start and completion rate are in high income areas, which may indicate that a lack of interest in, or need for, public funding assistance for higher education.

Figure 42: FAFSA Start and Completion Rates by High School, 2019
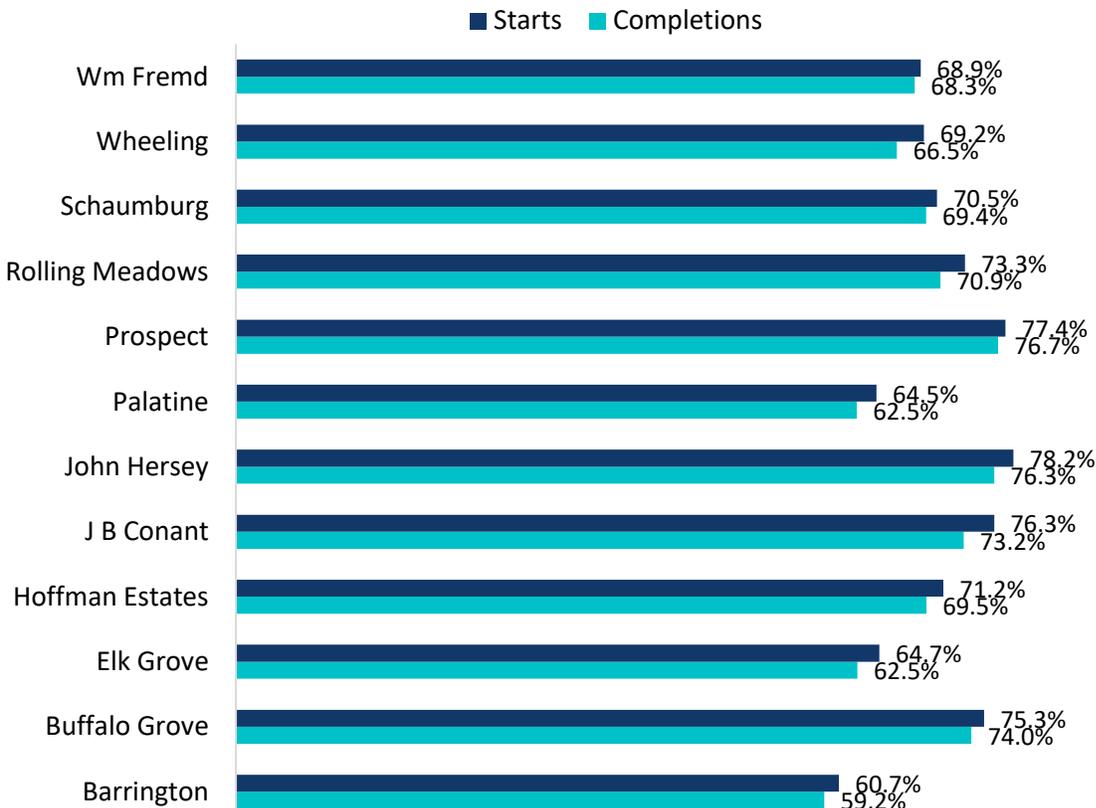
Source: Illinois Student Assistance Commission.

Map Grants

The Monetary Award Program (MAP) provides grants to students to help pay for tuition and mandatory fees at Illinois colleges and universities, and other degree-granting institutions. Illinois is one of the largest providers of state need-based aid in the nation. To qualify for the MAP grant a student must complete the FAFSA application, demonstrate financial need, be a resident of Illinois, and meet several other requirements. The maximum award level is dependent on legislative action and the funding made available in any given year.

Figure 43: 2018 Monetary Award Program Applications and Eligibility
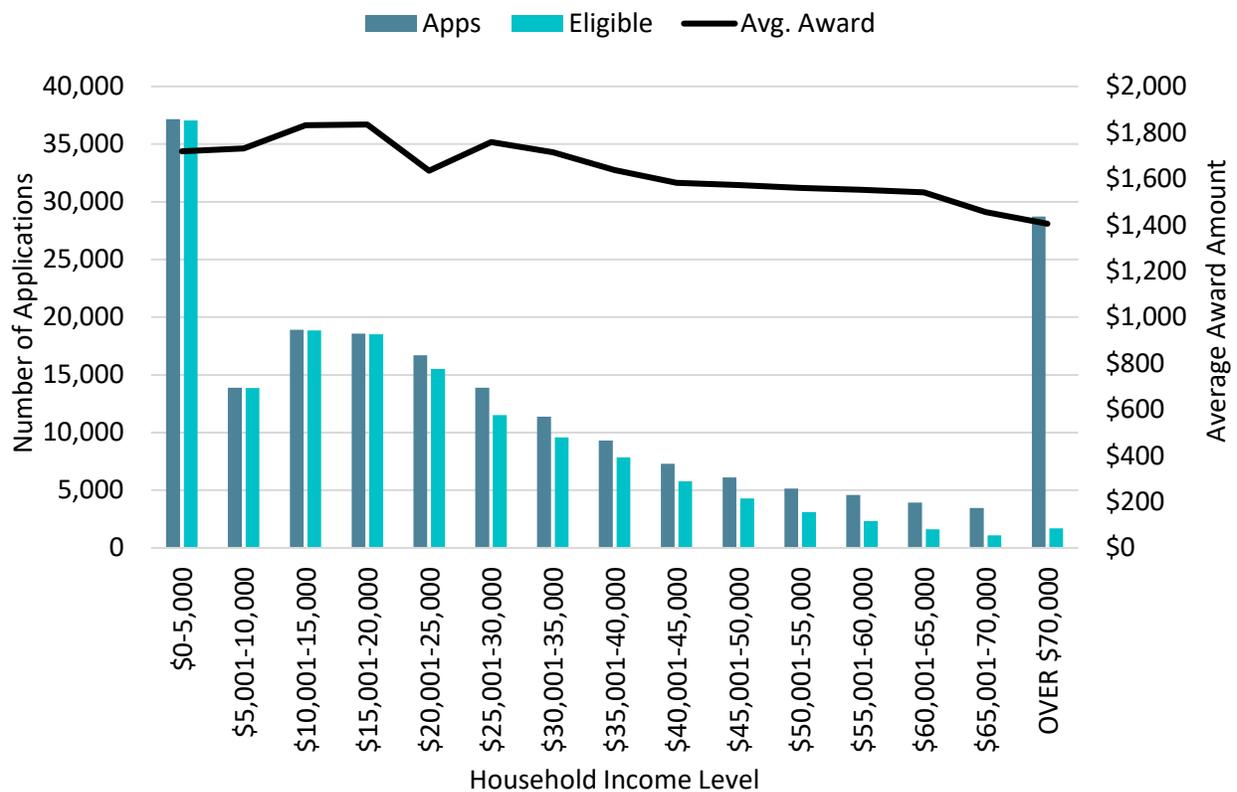
Source: Illinois Student Assistance Commission, 2018 Data Book.

Federal Pell Grant

The Federal Pell grant is based upon demonstrated need for financial assistance. This funding is only available to undergraduates and the amount available to an individual student is based upon their ability to afford tuition and fees. Students must be attending college at least part-time and eligible for up to three semesters of funding assistance per year. These grants do not need to be repaid, which helps to keep student loan debt to a minimum.

Figure 44 shows the percentage of the 11th grade students that applied and were deemed eligible for Pell grant funding. Some students do not accept the funds for which they are eligible for a variety of reasons. Some may enroll in a different institution with a different financial aid package. Therefore, Figure 44 only shows the percentage of students from the sender schools that were found to be eligible for funding based on a completed FAFSA. Barrington students have the lowest eligibility for PELL grant funding due to the higher incomes in that community and the lower number of students who seek financial assistance.

Figure 44: Percentage of Pell-Eligible Applicants at Harper District High Schools, 2012-2018
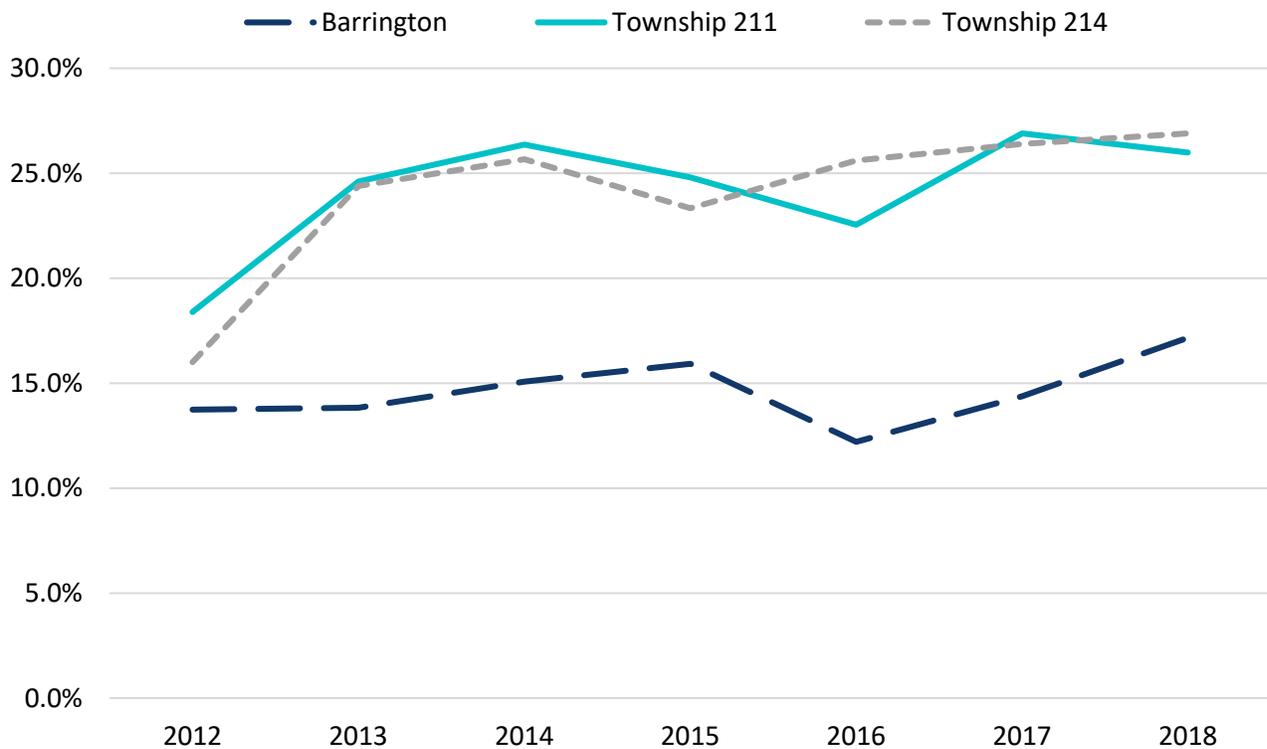
Source: Illinois Student Assistance Commission.

College Readiness

11th Grade SAT

The SAT has been used to gauge college readiness in Illinois since 2017. The two sections, Math and English Language Arts (ELA), are administered to all Illinois 11th grade students as a required examination. Academic preparation for higher education is crucial for academic success. The SAT is used in admissions review by institutions of higher education and is often used to determine eligibility for academic scholarships. Scores in the SAT subject area tests are used to set proficiency standards for Illinois public schools. Figure 45 shows the percentage of district high school SAT takers who meet or exceed the Illinois Learning Standards. Prospect High School has the highest percentage of students that meet or exceed the Illinois Learning Standards in ELA (65.4%) and Math (71.4%). Wheeling High School had the lowest percentage in ELA (30.2%) and Math (29.5%). For comparison purposes, the statewide percentage is 37.0% in ELA and 35.0% in Math.

Figure 45: Percentage of High School SAT Takers that Met or Exceeded Standards, 2019
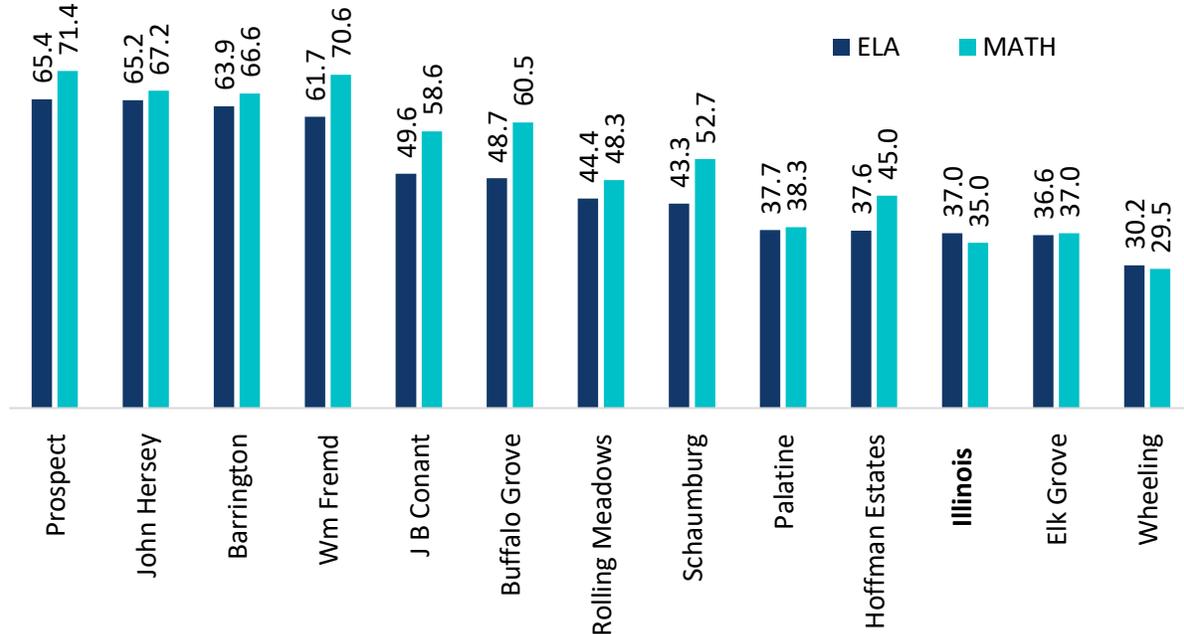
Source: Illinois State Board of Education, Report Card.

Each student taking the SAT is scored into one of four categories relative to the Illinois Learning Standards (Figure 46 shows ELA levels & Figure 47 shows Math levels). Level 1 (dark blue) is the percentage of students who only partially met the standards and demonstrated a minimal understanding of the knowledge and skills needed to meet the Illinois Learning Standards. Level 2 (light blue) is the percentage of students who are approaching the proficiency level but demonstrate an incomplete understanding of the knowledge and skills required. Level 3 (light green) meets the standard and demonstrates adequate understanding of the knowledge and skills needed, while Level 4 (dark green) exceeds the standards.

Figure 46: Percentage of 11th Graders Scoring at each of the SAT Performance Levels in ELA
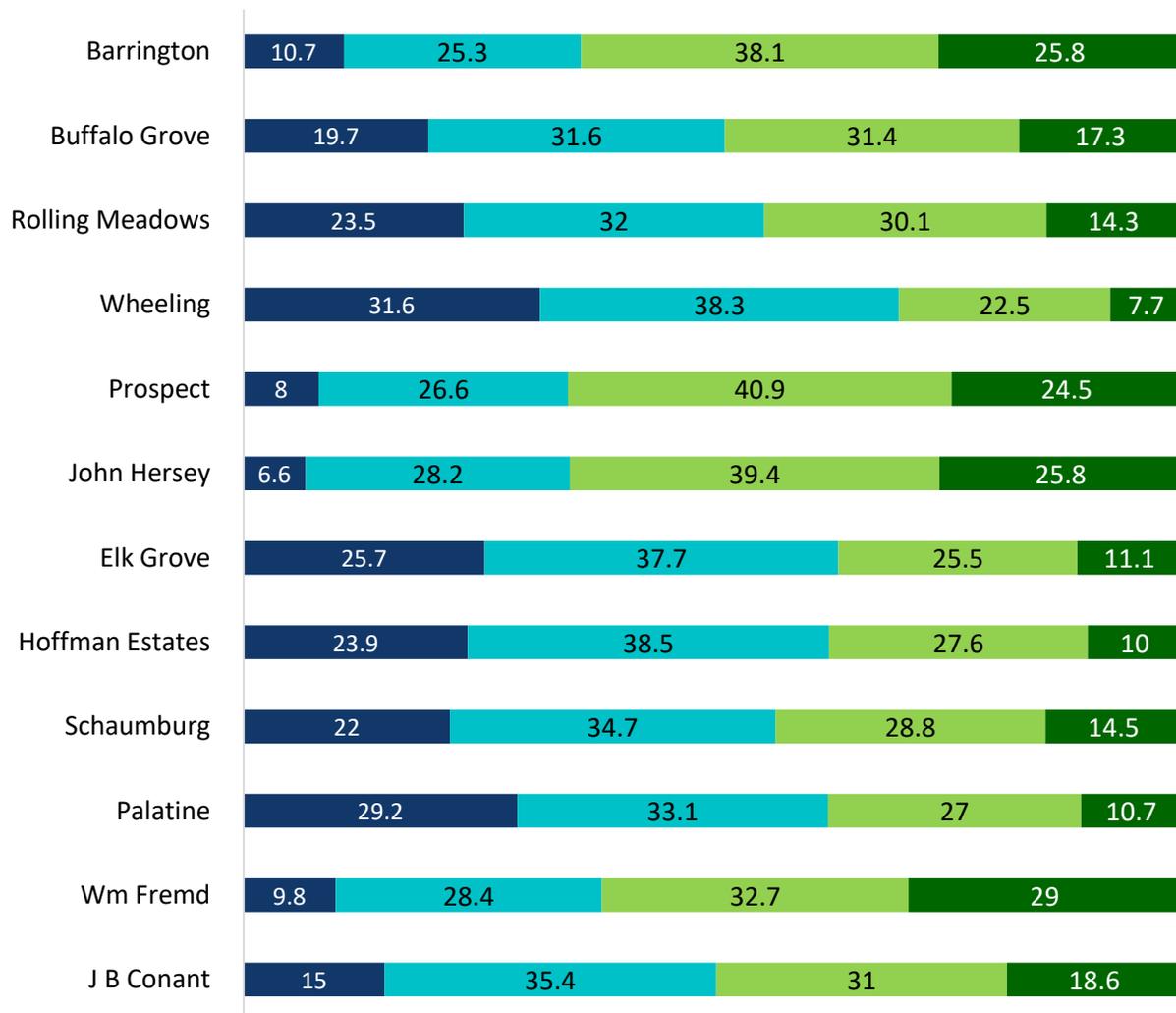
Source: Illinois State Board of Education, Report Card.

Figure 47: Percentage of 11th Graders Scoring at each of the SAT Performance Levels in Math

Barrington	13.8	19.7	38.4	28.2
Buffalo Grove	17.5	22	38.5	22
Rolling Meadows	25.6	26.2	36.4	11.9
Wheeling	30.6	39.9	22.3	7.2
Prospect	7.8	20.8	44.4	27
John Hersey	7.6	25.2	43.1	24.1
Elk Grove	27.7	35.3	29.8	7.2
Hoffman Estates	25.7	29.3	30.7	14.3
Schaumburg	19.6	27.7	35.6	17.1
Palatine	27.8	33.9	26.2	12.1
Wm Fremd	9.5	19.8	39	31.6
J B Conant	14.6	26.8	38.2	20.4
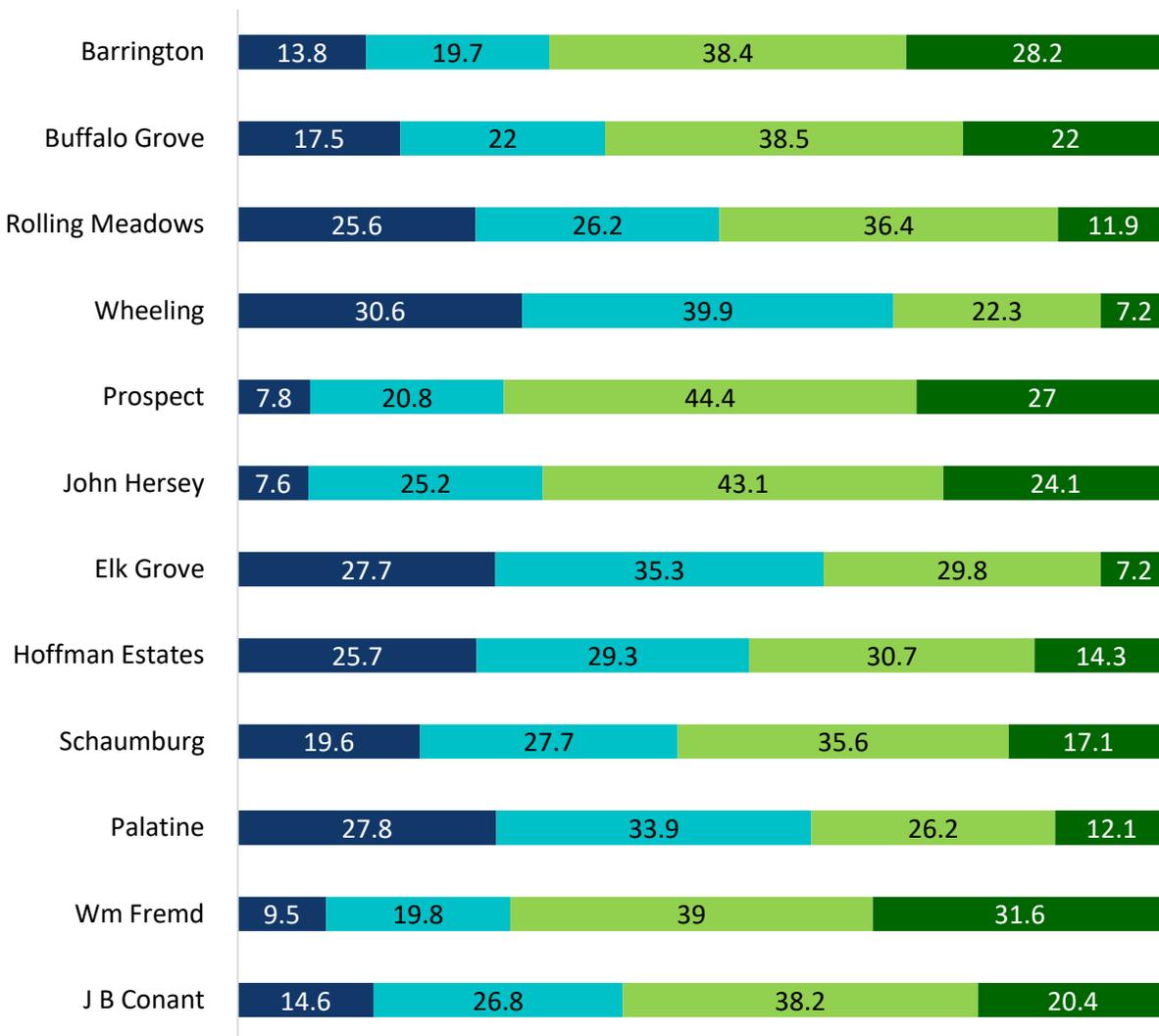
Source: Illinois State Board of Education, Report Card.

Early College Coursework

Completing early college coursework can reduce the cost of higher education by allowing students to earn college credit at low or no cost while they are still in high school. Figure 48 shows the total number and percentage of district high school students taking early college coursework in grades 10, 11, and 12 in 2019. The table further divides these courses into Advanced Placement (AP) and Dual Credit courses. Students may be enrolled in more than one type of early college coursework, but they are only counted once in the overall enrollment total.

Upon completion of an AP course, students may choose to take the College Board's corresponding AP Exam. Illinois state law PA 99-0358 provides that a student who receives a score of 3 or higher on the College Board AP examination is entitled to receive postsecondary course credit at an Illinois public institution of higher education and apply that credit to meet a corresponding course requirement for degree completion at that institution.

The sender schools in the Harper district have high participation in early college coursework, especially in grade 12 at the two Township High School Districts. THSD 214 has the highest participation rate, with 83.3% of 12th graders enrolled in AP or Dual Credit. Harper district high schools, at all 3 grade levels, participate at rates higher than the state average.

Figure 48: Early College Coursework by Sender Schools, 2019

		Barrington	THSD 211	THSD 214	IL	Total
Grade 10	**Total Students**	**366 (50.9%)**	**1,110 (38.3%)**	**1,247 (43.2%)**	**20.2%**	**2,723**
	AP Courses	329	888	1,111		2,328
	Dual Credit Courses	46	287	237		570
Grade 11	**Total Students**	**490 (62.9%)**	**1,940 (65.2%)**	**1,762 (59.9%)**	**41.1%**	**4,192**
	AP Courses	447	1,566	1,481		3,494
	Dual Credit Courses	129	1,015	636		1,780
Grade 12	**Total Students**	**599 (54.8%)**	**2,174 (73.5%)**	**2,664 (83.3%)**	**51.6%**	**5,437**
	AP Courses	493	1,633	1,903		4,029
	Dual Credit Courses	316	1,415	2,255		3,986

Source: Illinois State Board of Education, Report Card, 2019.

Community College Remediation

Remediation, sometimes called developmental education, is designed to help students achieve a level of college and career readiness that will enable them to succeed in core academic subjects such as reading, math, and science. Community colleges require students to take remedial courses if they are judged to need additional preparation to succeed in college-level coursework. Almost 44.2% of the 2017 graduating class entering community colleges in Illinois were placed in remediation coursework in at least one subject. These courses incur tuition costs, but do not earn college credit. Students may be identified as needing remedial courses during high school or through college placement tests. Working with their local community colleges, some Illinois high schools are teaching college-level remedial courses to high school seniors and are seeing dramatic reductions in the number of students needing remediation upon entry to college.

Figure 49 shows there were 2,040 students that graduated in 2017 from the Harper sender districts and subsequently enrolled in community colleges, representing 32.2% of the graduating class. 360 of those students needed to take remedial coursework, representing 17.6% of those entering the community college system.

Figure 49: Community College Enrollment Among 2017 High School Graduates

	2017 Graduates	College Enrollment	Percent
Barrington	748	174	23.3%
THSD 211	2,819	1,018	36.1%
THSD 214	2,759	848	30.7%
Harper District	6,326	2,040	32.2%

Source: Illinois State Board of Education, Report Card, 2019.

Figure 50 displays the number of 2017 graduates who were required to take remedial courses at Illinois community colleges. The overall count shows the unique count of students from each sender district who enrolled in a community college and were required to take any type of remedial courses. The three categories of reading, communication, and math show a unique count for that subject area, but some students may have taken remedial coursework in more than one category.

Figure 50: Community College Remediation for 2017 Graduates in Harper Feeder Schools
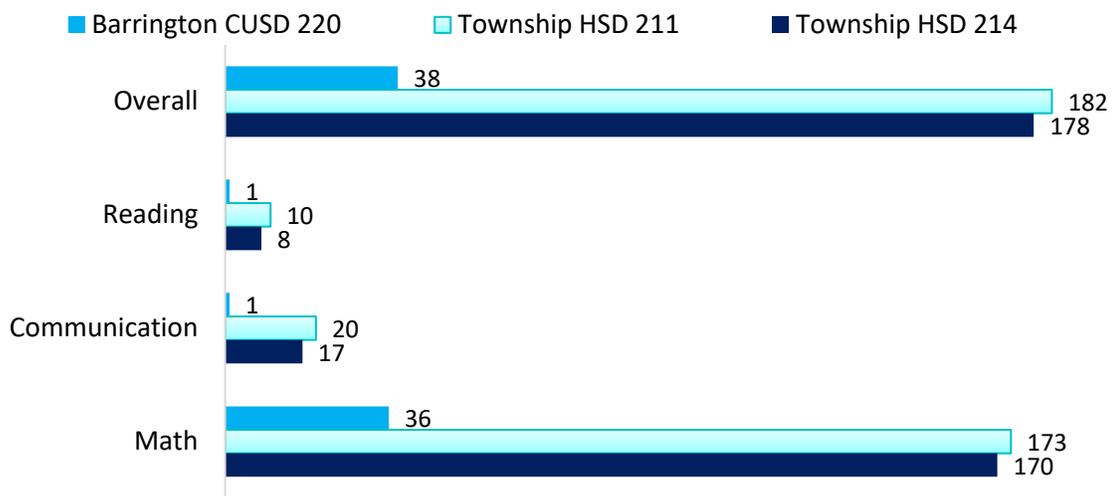
Source: Illinois State Board of Education, Report Card, 2019.

Career Technical Education

The sender districts provide a wide variety of career and technical education (CTE) coursework for students to explore. There are fourteen categories of coursework and Figure 51 shows the total number of participants (part) and concentrators (conc) enrolled in CTE courses. Participants are those who enroll in one or more CTE course within that subject area, while concentrators are those who complete 12 or more credits in that area. During the 2018 school year, a total of 13,921 students participated in CTE throughout the Harper district. Hospitality & Tourism programs, which may include subjects like culinary arts and hotel management, had the highest participation, followed by Business Management and Administration.

Figure 51: Career Technical Education Offered by Sender Districts, 2018

| | Barrington | | THSD 211 | | THSD 214 | |
Cluster	Conc	Part	Conc	Part	Conc	Part
Architecture and Construction	5	27	9	168	5	312
Arts, Audio/Video Technology and Communications	8	154	2	44	4	321
Business, Management and Administration	8	345	11	1,294	6	828
Education and Training	1	20	2	335	2	58
Health Science	3	40	2	536	3	603
Hospitality and Tourism	4	301	8	1,362	5	1,103
Human Services	2	271	5	704	4	757
Information Technology	3	169	2	58	6	442
Law, Public Safety, Corrections and Security	1	8	2	32	3	30
Manufacturing	5	178	7	520	8	731
Marketing	2	16	0	0	2	7
Science, Technology, Engineering and Mathematics	4	213	5	637	6	582
Transportation, Distribution, and Logistics	0	0	3	525	3	188
Finance	0	0	1	1	1	1
TOTAL	46	1,742	59	6,216	58	5,963

Source: Illinois State Board of Education, Career Technical Education, 2018

Sender Districts Performance Conclusion

The sender districts, Barrington 220, Township HSD 211 and Township HSD 214, continue to perform at high levels in comparison to the state average. While the residential population is diversifying, so too are the students enrolled in the schools. As more White residents move out of the area, diversity in the schools will likely increase. The younger grades are experiencing the most diversification as young, minority families move into the district.

Performance indicators remain high, but the number of dropouts has increased at all local high schools. The dropout rates are still well below the state average, but worth watching for further increases in the next few years. The mobility of students has declined over time. A large percentage of students are taking early college coursework and participating in Career Technical Education (CTE) courses offered at the high schools.

Housing Trends

Property values and neighborhood stability in Illinois have been lagging in comparison with the rest of the nation. Strong communities promote greater earning potential when basic needs are met. Homeownership provides stability and builds equity for financial well-being. However, Illinois has not had a strong economic recovery following the Great Recession in 2008. There are still many homes experiencing lower property valuation than before the recession and a higher number of people are living in rental units after losing their homes during the housing crisis. Typically, recovery is felt within a five-year span, but many residents are struggling to return to their prior financial well-being after more than a decade in Illinois. This trend is projected to continue for several more years. However, the housing market is improving.

Foreclosures

The number of home foreclosures in the Harper region have significantly declined. Aggregating the municipalities in the Harper region, the number of properties completing the foreclosure to auction process hit a record high in 2012 and has drastically decreased ever since, reaching a new low of 778 in 2018.

Figure 52: Harper Region Foreclosure Auctions in District (by aggregated municipalities)
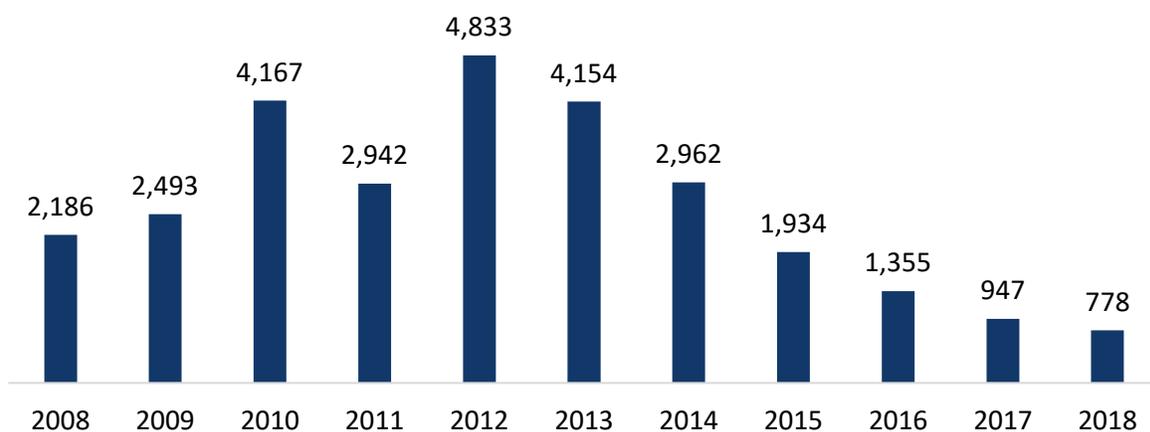
Source: Woodstock Institute, Foreclosure Data.

Properties filing for foreclosure have drastically decreased as well. Condominium foreclosures reached a peak in 2010 of 2,764 units and declined to only 296 in 2018. Multi-Family units reached a high in 2009 of 52 buildings and declined to only 4 buildings in 2018. Single-family homes, which were the hardest hit, reached a peak in 2010 of 4,453 homes and declined to only 870 filers in 2018. The decreases in foreclosure activity is great news for communities as residents have adjusted their mortgage outlays for more sustainable housing.

Housing Unit Occupancy

Occupied housing units may be inhabited by the owner or a renter. Since the 2008 Great Recession, many households switched to rental units after losing a home or experiencing income declines that made rental units the affordable option. Figure 53 demonstrates this shift in home occupancy. In the last ten years, the number of rental units has continued to increase in the Township High School sender districts, while Barrington district has remained steady, decreasing the number of rentals and gaining 26 new owner-occupied homes. The total number of housing units available slightly increased by 0.1%, or 277 new units. The number of homes occupied by the owner has decreased by 5,211 units, or 3.5%, while units occupied by renters has increased by 5,488 units, or 10.5%. It is expected these trends will begin to reverse as the economy in Illinois improves, but it has been a long process for those who lost their homes or cannot afford to buy a home and get out of their rental units.

Figure 53: Owner and Renter Occupancy, 2012-2018

Harper Sender High School District Housing	Occupant	2012	2018	Number Change	Percent Change
Township High School District 214	Owner	72,149	69,130	-3,019	-4.2%
Township High School District 211	Owner	63,102	60,884	-2,218	-3.5%
Barrington Community Unit School District 220	Owner	13,884	13,910	26	0.2%
Township High School District 214	Renter	25,191	28,407	3,216	12.8%
Township High School District 211	Renter	25,356	27,749	2,393	9.4%
Barrington Community Unit School District 220	Renter	1,890	1,769	-121	-6.4%
TOTAL		201,572	201,849	277	0.1%

Source: U.S. Census Bureau, American Community Survey, 2012 & 2018 Five Year.

Housing Value

Homes are worth what the sale value is, but homeowners may believe their home to be worth less than market value. The perceived value of homes has declined since 2012 except for homes that are under $25,000, which have seen a slight uptick, and homes ranging from $50,000 to $100,000 in value, close to doubling in number. The homeowners' perception of the value of their homes is usually lower than reality. These numbers are not adjusted for inflation, but inflation was minimal over the five-year period of 7% which has a negligible impact on the category ranges.

Figure 54: Perceived Value of Homes, 2018

	2012	2017
Up to $24,999	2,063	3,137
$25 to $49,999	2,160	1,769
$50 to $99,999	5,413	9,030
$100 to $199,999	30,067	29,690
$200 to $399,999	72,956	67,951
$400,000 and Over	36,476	33,170
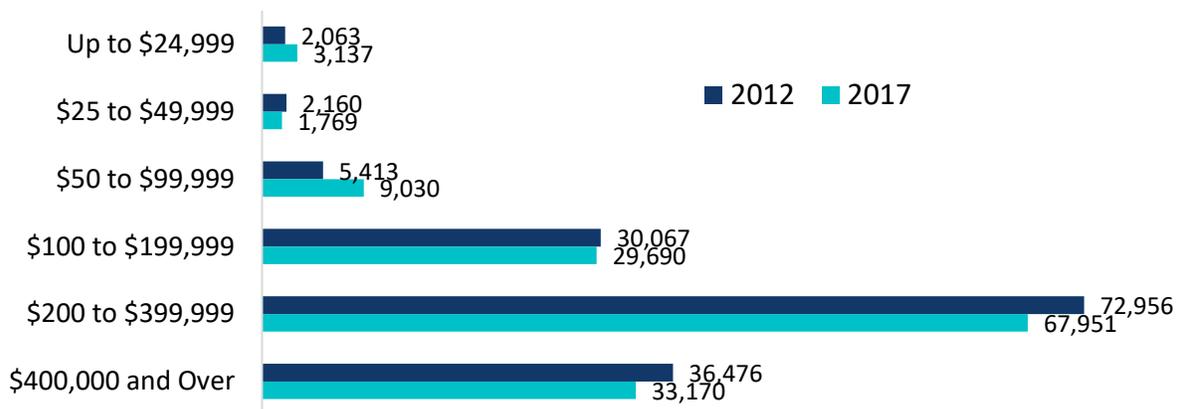
Source: U.S. Census Bureau, 2018 American Community Survey Five-Year Data.

However, the Illinois Realtor's Association is reporting an increase in the value of homes sold and an increased number of sales since 2012. The median sales price has increased from $160,000 to $242,500 in six years, indicating that more expensive homes are entering the market. The Baby Boomer generation is looking to down-size as they settle into retirement. This trend could be what is happening in the Harper district -- spiking the median sales price. In a recent survey, Nationwide Mortgage reported that some homes are being listed at 50% of the value when it was built to order to unload quickly in this market. The Millennials are looking for new, smaller homes with an open concept layout and clean lines, rather than the more ornate Baby Boomer style[12].

If the same trend is true in the Harper region there could soon be an influx of Millennial families moving into the more expensive homes, making the region a primary location for career opportunities. Especially if the homes are being sold well below value. Equity will be quickly built for neighborhood security and liquidity for purchases such as tuition for their children.

Figure 55: Median Home Sales Price and Number of Closed Sales
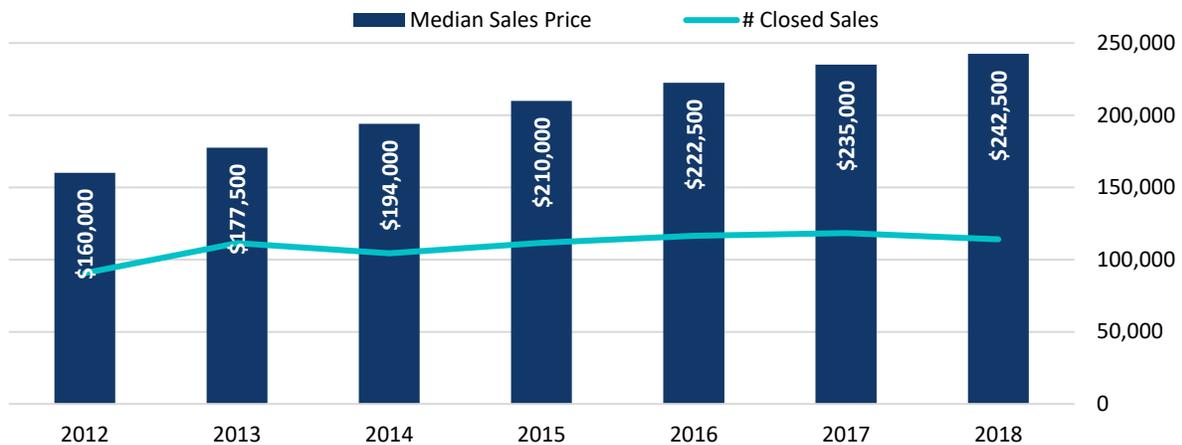
Source: Illinois Realtor's Association, Market Stats.

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[12] Business Insider report located at: https://www.businessinsider.com/millennials-vs-baby-boomers-big-houses-real-estate-market-problems-2019-3.

Housing Conclusion

The housing market was hit hard by the Great Recession, especially in Illinois. However, the foreclosures that were so prevalent in recent years have quieted down to lower than pre-recession levels. There are still many households that converted to rentals and that is still the trend in the Harper district. While owner-occupied homes are still the majority, the number of owner-occupied homes continue to decline while rental units continue to increase. Until the residents can save money and recover their credit ratings to purchase new homes the trend is likely to continue. Many of the millennials who are at the home-buying age are not able to afford to purchase either, further exacerbating the situation.

Meeting the Needs of Business and Industry

There have been many changes in the workforce since 2008. Although the recession officially ended in June 2009, the economic recovery in Illinois has been relatively weak when compared to the rest of the nation. While unemployment rates have fallen substantially over the past eight years, labor force participation among key working aged populations continues to decline. This section looks at unemployment trends, the necessary hourly wage to sustain a family, and household income trends in the municipalities within the Harper district.

Employment and Labor Force Participation

Six months after the end of the last recession, unemployment peaked in the Chicago metropolitan area at 12.2% in January 2010. Since then the unemployment rate has shown steady but slow improvement, falling to 5.3% in November 2016.[13]   Figure 56 shows the fluctuations that have taken place over several decades that include two major and three minor recessions. The 2007-2009 recession resulted in across-the-board increases in unemployment,

Figure 56: Unemployment Trends
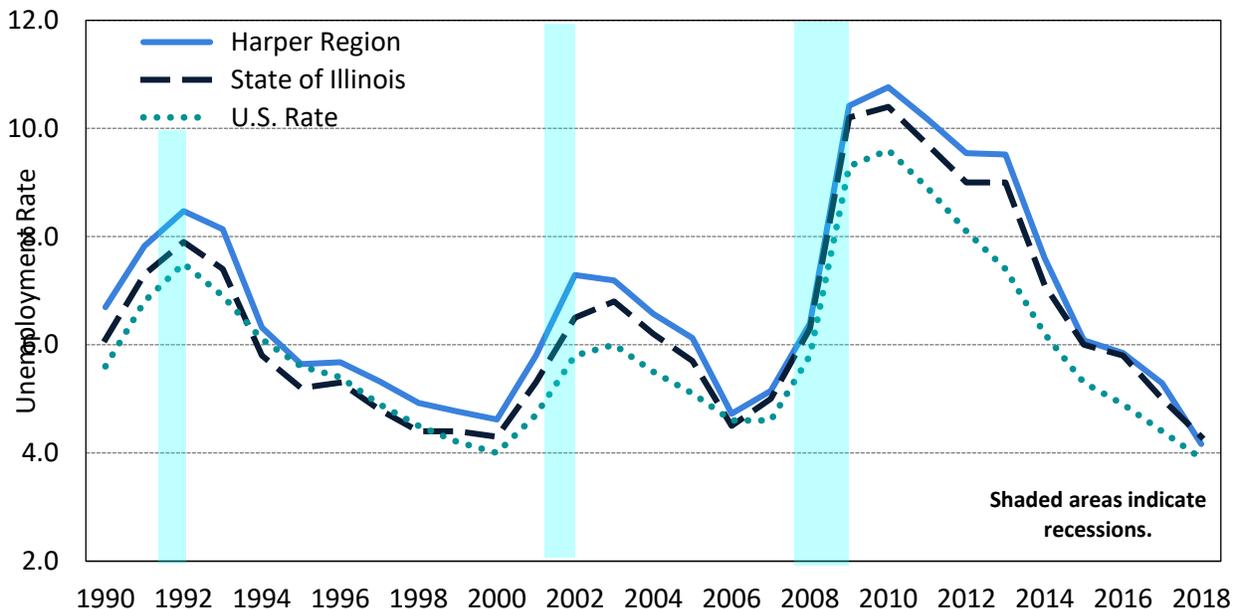
Source: Illinois Department of Employment Security.

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[13] The unemployment rate is based upon who is actively seeking work in the last week when surveyed. If a potential worker is not currently employed and not actively seeking employment, then they are not considered to be in the labor force.

with some counties in the Harper region reaching record highs in unemployment. It is important to note that the decline in the unemployment rate following the recession was linked not to the growth in employment, but rather to the decline in labor force participation (i.e., those employed or unemployed and actively looking for work). The labor force participation rate has been declining steadily across the U.S. since the late-1990s and is currently at its lowest level since the late 1970s. Labor force participation in the Harper region[14] was lower in 2018 (63.4%) than the state average (64.5%) but higher than the national average (62.9%) and its downward trajectory is comparable to that of Illinois (Figure 57). The reasons for this decline, while difficult to document, include the aging of the population and the wave of Baby Boomer retirements, a growing number of disabled working-age people, and the opioid epidemic. It also includes individuals who lack the education, appropriate skills or accessibility to secure regular employment[15].

Figure 57: Labor Force Participation Rate Trends 2010-2018
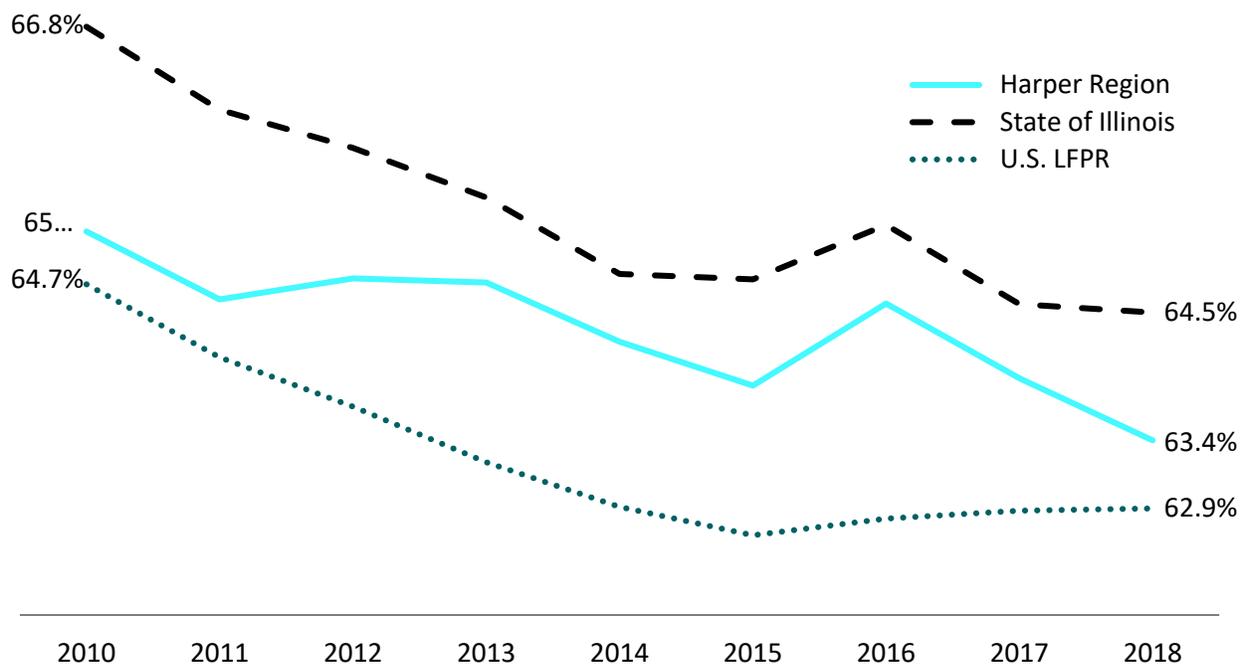
Source: U.S. Bureau of Labor Statistics, 1990-2018.

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[14] The Harper region consists of Cook, Lake and McHenry counties in Illinois.

[15] Walzer N. and Harger B., "Unemployment, Labor Force Participation and The Illinois Work Force" Policy Profiles. Vol. 17, No. 1, June 2017. DeKalb: Center for Governmental Studies, Northern Illinois University.

Prior to the last recession, non-farm employment in the Harper region has tended to perform better during recessions (i.e., experiencing lower levels of job loss), but with more modest job growth during economic expansions when compared to the state or the nation (Figure 58). The region's level of job loss in the last recession mirrored the state and national trend. Since then employment growth in the Harper region was nearly twice that of the Illinois average, but half that of the national average. A recent analysis of employment trends in Illinois since the recession revealed that most of the metro areas outside the Chicago area had lower employment in June 2019 than in June 2009 (10 years after the official end of the recession)[16]. Non-farm employment in the Harper region increased from 2,866,921 in June 2009 (the official end of the recession) to 3,092,813 in June 2019.

Figure 58: Change in Non-Farm Employment Through Recent Business Cycles

Area Name	Recession 6/1990 3/1991	Expansion 3/1991 2/2001	Recession 2/2001 11/2001	Expansion 11/2001 12/2007	Recession 12/2007 6/2009	Expansion 6/2009 6/2019
Harper Region*	-3.3%	10.4%	-2.0%	1.2%	-4.8%	7.9%
State of Illinois	-3.3%	11.7%	-1.3%	5.9%	-5.1%	4.9%
U.S.	-2.8%	22.0%	0.6%	5.4%	-5.3%	15.4%

*The Harper region consists of Cook, Lake and McHenry counties in Illinois.
Source: U.S. Bureau of Labor Statistics, 2019.

Industry Establishment Trends

The slow economic recovery was due in part to substantial job losses in construction, manufacturing, wholesale trade, and several business services sectors. Some sectors continue to experience job losses post-recession (e.g. manufacturing) or are struggling to regain pre-recession levels of employment. Even so, they continue to be significant players of the regional economy and a substantial number of new workers will be needed in all sectors over the next decade to replace retirees.

Small businesses dominate the regional economy. Establishments with fewer than ten employees account for nearly three-quarters of all private businesses (Figure 59). These smaller enterprises

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[16] Harger B., "Ten Years After… Employment Trends in Illinois Since the Great Recession" *Policy Profiles*. forthcoming. DeKalb: Center for Governmental Studies, Northern Illinois University.

are especially prominent in Professional, Scientific and Technical services, Construction, Retailing and Health Care and Social Assistance. According to the U.S. Census Bureau, from 2010 to 2017, companies in the Harper region with fewer than five employees increased by 5.2% (4,655 establishments). The proportion of establishments in this size category remained relatively unchanged from 57.1% in 2010 to 58.7% in 2017.

Figure 59: Establishments by Employment Size Class and Industry Sector, Harper Region*, 2017
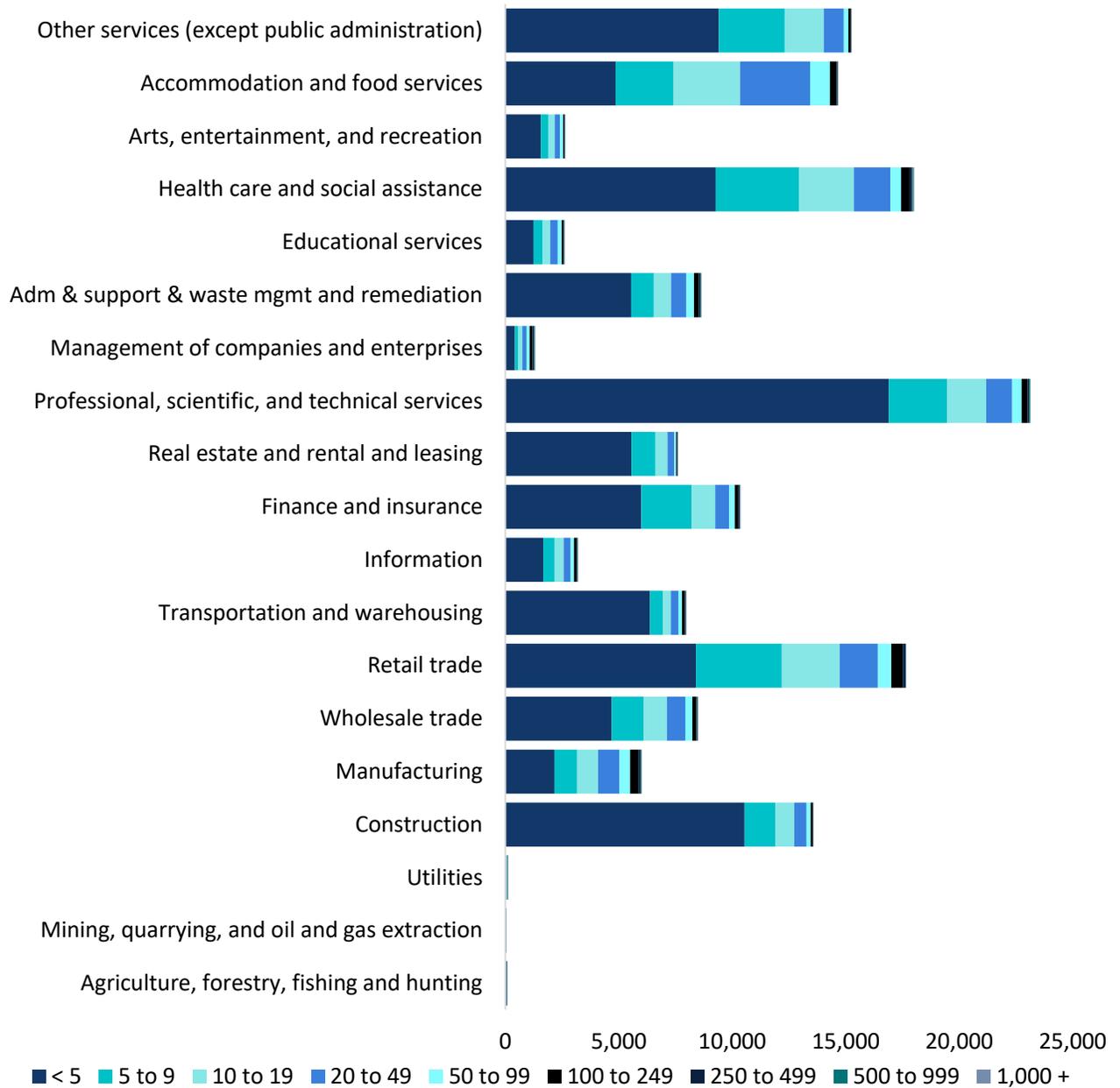
*The Harper College Region consists of Cook, Lake and McHenry Counties.
Source: U.S. Census Bureau, County Business Patterns, 2016.

Industry Employment Trends

Accommodation and Food Services and Health Care and Social Assistance were the fastest growing sectors in the Harper region between 2010 and 2019, adding 58,086 and 58,086 jobs, respectively. The Chicago area's popularity as a conference and convention venue, as well as a tourist destination will likely ensure continued growth in the Accommodation and Food Services sector. The ongoing aging of the population and the workforce would also seem to suggest that job opportunities in Health Care and Social Assistance will continue to be plentiful through the next decade.

During the same period, Professional, Scientific and Technical Services experienced an employment gain of 47,152, while Administrative Support, Waste Management and Remediation Services saw an increase of 46,176 jobs. The Professional, Scientific and Technical Services is of interest as it offers many high-paying white-collar jobs requiring post-secondary credentials. Administrative Support, Waste Management and Remediation Services offers a variety of both blue- and white-collar jobs that also require certifications or degrees.

Industry sectors providing more blue-collar employment opportunities are also experiencing renewed growth. Transportation and Warehousing has added over 31,000 jobs since 2010 as this sector expands throughout the region, as well as the State. The Construction sector is also recovering many of the jobs that were lost in the last recession, adding over 16,000 jobs between 2010 and 2019. Even so, the industry is still struggling against a slow growing real estate market and a shortage of skilled tradespeople. The Manufacturing sector, despite significant job losses in recent years, lower growth prospects in comparison to other sectors, and accounting for a relatively small share of overall employment, still plays a vital role in the regional economy. It, along with the Construction industry, are still a good source of many high paying jobs and, because of an aging workforce, will continue to offer substantial job opportunities into the future. (Figure 60 on the next page).

Figure 60: Change in Industry Employment

Harper Region*	Employment		Change 2010 - 2019	
	2010	**2019**	**Number**	**Percent**
Total, All Industries	2,847,307	3,141,807	271,248	10.3%
Agriculture, Forestry, Fishing and Hunting	1,463	2,063	600	41.0%
Mining, Quarrying, Oil and Gas Extraction	657	695	38	5.8%
Utilities	5,422	6,749	1,327	24.5%
Construction	81,934	98,414	16,480	20.1%
Manufacturing	255,494	251,936	-3,558	-1.4%
Wholesale Trade	125,068	129,637	4,569	3.7%
Retail Trade	273,607	282,982	9,375	3.4%
Transportation and Warehousing	119,226	150,994	31,768	26.6%
Information	56,117	56,310	193	0.3%
Finance and Insurance	172,337	181,774	9,437	5.5%
Real Estate and Rental and Leasing	45,599	51,978	6,379	14.0%
Professional, Scientific and Technical Services	209,969	257,121	47,152	22.5%
Management of Companies and Enterprises	53,364	50,562	-2,802	-5.3%
Administrative Support, Waste Management and Remediation Services	198,049	244,225	46,176	23.3%
Educational Services	105,107	116,788	11,681	11.1%
Health Care and Social Assistance	352,657	406,188	53,531	15.2%
Arts, Entertainment, and Recreation	41,225	55,561	14,336	34.8%
Accommodation and Food Services	221,201	279,287	58,086	26.3%
Other Services	127,580	134,846	7,266	5.7%
Government	401,231	383,691	-17,540	-4.4%

*The Harper region consists of Cook, Lake and McHenry counties in Illinois.
Source: EMSI, 2019.

Specializations or concentrations of related industries are a widely recognized economic development phenomenon and play an important role in promoting and maintaining the vitality of cities, regions, and states. Location quotients (LQ) are one of several methodological tools used in economic research to quantify and compare concentrations of industries in a one region to another and are critical for assessing an area's economic strengths and weaknesses. Location quotients are especially useful in identifying both the distinguishing industries and the commonalities between regional economies. They can serve to confirm the intuitively obvious or identify emerging trends as economies change, grow, and diversify. If the LQ is 1.0, that industry has the same share of employment as the U.S. If the LQ is greater than 1.0, it has a greater share of local area employment than the national average, and if less than 1.0, a smaller share. For example, the LQ for the entertainment industry in Los Angeles, California is well above 1.0

because of the high concentration of employment in that sector. Industries with high LQs are usually export-oriented, which is important because they bring money into an area, rather than recirculate it like retail and food service operations do. This technique also helps identify industries that distinguish Harper region (Cook, Lake and McHenry counties) from the surrounding metro area.

In the Harper region, see Figure 61, the Educational Services has the highest LQ of any other industry (1.45), even though it is one of the smaller sectors in terms of employment. It also has the distinction of being one of only two sectors to experience job growth both during and after the recession. Finance and Insurance also ranks second with and LQ 1.40. Professional, Scientific, and Technical Services and Administrative and Support and Waste Management Services represent two high growth industry sectors in the region with the former adding 47,153 jobs (22.5%) between 2010 and 2019, while the later experienced an increase of 46,176 jobs (23.3%). Transportation and Warehousing also has a significant presence with an LQ of 1.33 in 2019, with the industry adding near 32,000 since 2010.

Despite being the largest single industry sector in the region, employing over 406,000 and the addition of over 53,000 jobs since 2010, Health Care and Social Assistance has an LQ of just below 1.0. However, with the continued aging of the population and the increasing demand for health care services, the sector is expected to add another 58,000 jobs between 2019 and 2029.

Manufacturing remains an important sector, despite decades of declining employment. Between 2010 and 2019, manufacturing employment has declined by 1.4% and its location quotient remained slipped from 1.05 to 0.97. The decline of manufacturing employment stems from increased global competition, automation and the impact of new production technologies, as well as local business costs. Despite this, the Chicago metro area has considerable competitive advantages in terms of research and development, production technology, and specializations in the manufacturing of pharmaceuticals, electrical and electronic equipment, and fabricated metal products.

Figure 61: Location Quotients by Industry, Harper Region*

Industry Description	2010 LQ	2019 LQ	2029 LQ
Agriculture, Forestry, Fishing and Hunting	0.05	0.07	0.09
Mining and Oil and Gas Extraction	0.05	0.05	0.05
Utilities	0.46	0.60	0.69
Construction	0.68	0.64	0.60
Manufacturing	1.05	0.97	0.90
Wholesale Trade	1.08	1.08	1.04
Retail Trade	0.89	0.88	0.87
Transportation and Warehousing	1.35	1.33	1.37
Information	0.98	0.98	0.92
Finance and Insurance	1.42	1.40	1.44
Real Estate	1.09	1.10	1.10
Professional, Scientific, and Technical Services	1.31	1.32	1.31
Management of Companies and Enterprises	1.36	1.04	0.87
Administrative, Support, Waste Management	1.26	1.29	1.30
Educational Services	1.48	1.45	1.47
Health Care and Social Assistance	1.01	0.99	0.99
Arts, Entertainment, Recreation	1.02	1.14	1.21
Accommodation and Food Services	0.94	0.98	1.02
Other Services	1.03	1.09	1.10
Government	0.77	0.76	0.77

*The Harper region consists of Cook, Lake and McHenry counties in Illinois.
Source: EMSI, 2019.

Figure 62 is a visualization of the information in Figure 61. The size of the bubble is proportionate to employment in 2019. The bubbles are color coded based on the percentage change in employment from 2010 to 2019. The location quotient is located on the "X" axis, while the percent change in location quotient from 2010 to 2019 is on the "Y" axis. The graphic is divided into four quadrants.

Figure 62: Location Quotients by Industry Employment, Harper Region*
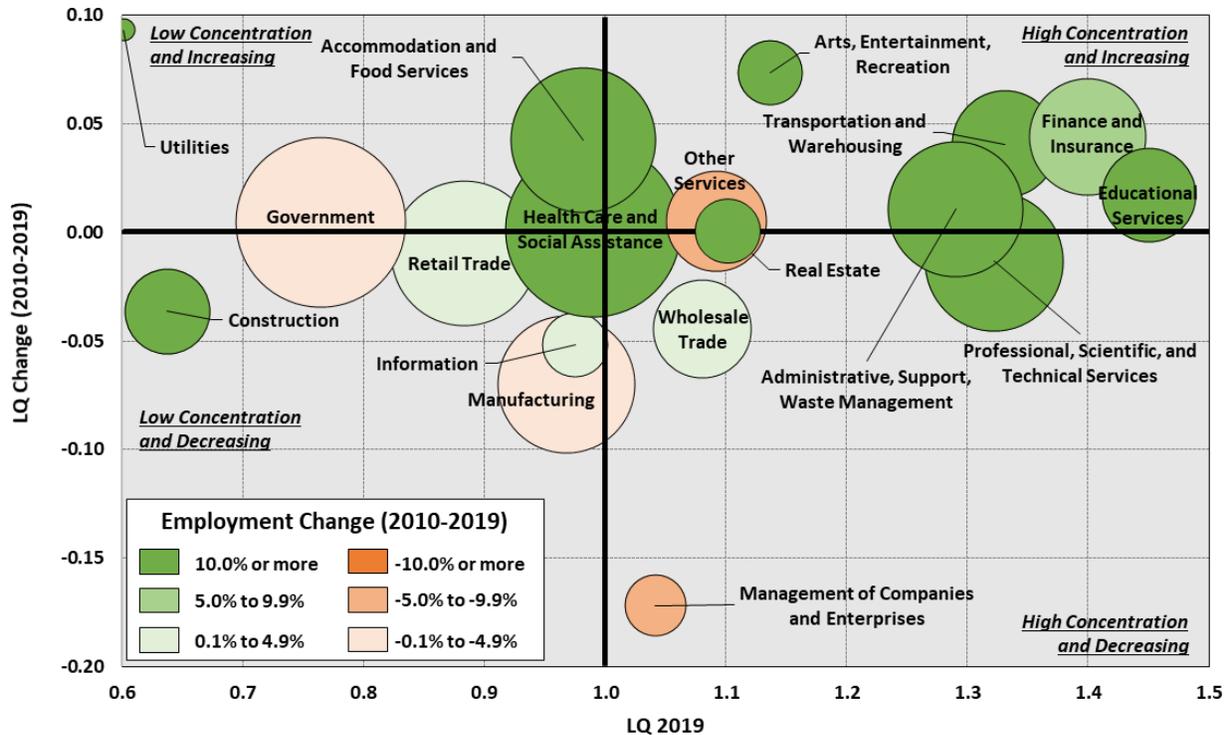
Note: Bubble size is equivalent to employment.
*The Harper region consists of Cook, Lake and McHenry Counties in Illinois
Source: EMSI, Inc., 2020.

High Concentration and Increasing represents growing industries that have a higher than average presence in the Harper region, such as Educational Services. This sector's employment concentration (location quotient) is 1.45 times the national average and has added more than 11,000 jobs since 2010. The Administrative, Support, and Waste Management Services has a comparable location quotient of 1.29 and has gained over 46,000 jobs between 2010 and 2919. The Finance and Insurance sector, though having fewer jobs and less job growth compared to the

other two sectors, has a location quotient (1.40). All three sectors offer a range of high wage-high skill jobs, as well as many entry-level opportunities.

Low Concentration and Increasing contains industries that are growing but have employment concentrations that are lower than average. These sectors may provide significant opportunities because they are showing signs of strength (growth) and room for continued growth (lower than average concentration). It includes the Accommodation and Food Services and the Utilities sectors. Although they are proportionately underrepresented at present, both have enjoyed positive job growth in the recent decade and are expected to continue adding jobs into the next.

High Concentration and Decreasing includes industries with a high location quotient in the region but have declining presence. In most cases this is merely an indication that employment in these sectors are growing faster in the U.S. than they are locally. In addition, most of the sectors that fall into this category (Professional, Technical and Scientific Services, Wholesale Trade, and Real Estate and Rental and Leasing) have experienced substantial growth between 2010 and 2019, but the falling location quotient could be indicative of slower job growth in the future.

In contrast, the Management of Companies and Enterprises sector at present has a location quotient of 1.04, down from 1.36 in 2010. Not only has this sector been declining in its presence in the region, but it has also experienced a loss of 2,800 jobs between 2010 and 2019 and is projected to lose an additional 6,900 through 2029.

Low Concentration and Decreasing includes those industries that are contracting and have a low and declining location quotient. Although the Construction industry has recovered many of the jobs that were lost following the housing crisis of the mid-2000s, its growth is now being hampered by the lack of qualified younger workers to replace those that are reaching retirement. Also notable among the industries in this quadrant is Manufacturing. Although it remains a top employer in the region, it continues to experience a net loss of employment. Since 2010, it lost nearly 3,600 jobs in the Harper region, more than any other sector apart from Government. The impact of the decline of construction and manufacturing poses a serious problem for the regional economy going forward as these jobs are often high skill and high wage jobs.

Although Health Care and Social Assistance industry is growing throughout the U.S., as well as in the Harper region, it too (just barely) falls into this category. It is the largest sector in the region,

employing over 406,000 as of 2019 and has expanded by more than 53,000 jobs since 2010. As the aging of the population continues over the next decade, the demand for these services is increasing and it is projected to add another 58,000 by 2029.

Commuter Patterns

Commuting patterns are best described as worker outflow (employed residents in a specified area who work outside the area) and worker inflow (workers living in other areas but employed in a specified area). The regional labor market consists of those who live in the Harper

Figure 63: Commuters Into and Out of Harper's District, 2017
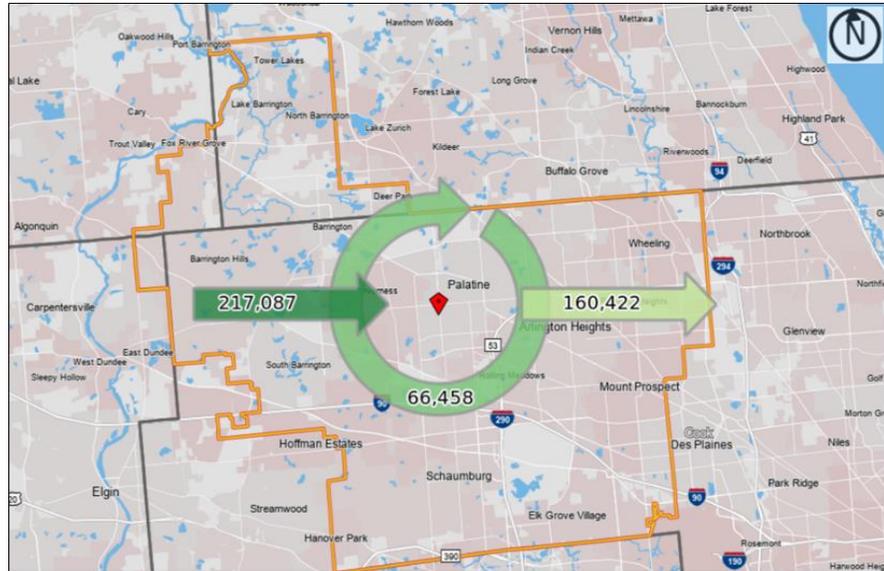
Source: U.S. Census Bureau, Center for Economic Studies.

College District but are employed in the surrounding areas and those who are employed in the district but live elsewhere (Figure 63).

Worker commuting patterns can be indicators of the true size and scope of regional labor markets. In metropolitan environments, they can indicate the degree of economic interaction with the surrounding region. A region's ability to pursue economic development depends in part on the supply and mobility of workers. Matching local talent with local jobs is not easily done in a labor market as mobile and diverse as the Chicago metropolitan area. In addition, there is the added dimension of interaction and competition for labor between the Harper district and the larger metropolitan market. Even so, there are slightly more employed in the district than are living here. While this situation affords workers with more opportunities for employment and employers with opportunities for talent acquisition, it also creates challenges for educational institutions in determining the types of training or degree programs to offer. Nevertheless,

understanding overall trends in workers' commuting patterns, location of regional business centers and activities, and the projected employment demand for key industries and occupations, provides important insights into how Harper can best position itself to serve the needs of future students and the business community.

Being part of one of the largest and most dynamic labor markets in North America, it is no surprise that the Harper district has a substantial number of workers who commute to jobs in the district. In 2017, 283,545 workers were employed in the district and 226,880 workers lived in the district, resulting in a net inflow of 56,665 jobs from the surrounding areas (Figure 64). The district also retains a relatively small share of its resident workers (66,458) both live and work in the district), while a much greater share commute to jobs elsewhere (160,422). The district also attracts 217,087 workers from surrounding areas.

Figure 64: Commuter Inflow/Outflow, Harper College District (2017)

Workers **Employed** in the Harper College District	283,545	
Employed **and** Living in the Harper College District	66,458	(23.4%)
Employed in the Harper College District but **Living Elsewhere**	217,087	(76.6%)
Workers **Living** in the Harper College District	226,880	
Living **and** Employed in the Harper College District	66,458	(29.3%)
Living in the Harper College District but **Employed Elsewhere**	160,422	(70.7%)
Net Job Inflow	56,665	

Source: U.S. Census Bureau, Center for Economic Studies, 2019.

The region's advantage in retaining resident workers, as well as drawing in workers from the surrounding area increased between 2012 and 2017. Workers who both live and work in the district increased by 505 (0.8%), while workers living in surrounding communities who commuted to jobs in the district increased by 15,525 (7.7%). Meanwhile, those living in the district but employed elsewhere grew by 8,579 (5.6%).

Retaining and attracting workers is becoming a critical issue as Baby Boomers continue to age out of the workforce. Trends across Illinois, as well as the nation, point to a long-term decline in the working age population groups. While the Harper district is in a much more favorable position compared to other parts of the State, the challenge going forward will be creating appropriate job opportunities to retain a significant share of them[17].

Figure 65 looks at the educational attainment of workers <u>living</u> in the Harper College District. This includes individuals who work in the area as well as those who commute to jobs elsewhere. They are an important constituency (or market) for Harper College, especially those individuals who have lower levels of educational attainment. One concerning trend is the number of workers who have not completed high school. The number of those workers increased by 4,226 (28.5%) between 2012 and 2017. On the positive side, the share of workers with a High School diploma or GED increased by 6,876 (19.6%) and those with Some College or an Associate degree grew by 5,704 (10.9%).

Figure 65: Education Attainment of Residents Who Work, Harper College District

Education Attainment Level	2012		2017		Change 2012-2017
	Count	Percent	Count	Percent	Count
Less than High School	14,846	6.3%	19,072	7.6%	4,226
High School or Equivalent, No College	35,165	14.8%	42,041	16.8%	6,876
Some College or Associate Degree	52,559	22.1%	58,263	23.3%	5,704
Bachelor's Degree or Advanced Degree	83,959	35.4%	81,323	32.5%	-2,636

Source: U.S. Census Bureau, Local Employment Dynamics, Home Area Profile, 2019.

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[17] Robinson, Diana and Harger Brian, "*Work-based Learning as a Lever for Economic and Workforce Development*", a presentation to the Governor's Summit on Workforce Development, East Peoria, Illinois, October 1, 2018.

Figure 66 looks at the educational attainment of workers <u>employed</u> in the Harper district. This includes individuals who both live and work in the area as well as those who commute from surrounding communities. As stated previously, there are approximately 56,000 more workers employed in the district than live in the district. Commuting workers are also an important market for Harper College. As with workers who live in the district, the number of workers who have not completed high school is on the rise. The number of those workers increased by 4,319 between 2012 and 2017. In a labor market that is experiencing a rising demand for skills and credentials beyond high school, this suggests there may be an unmet need for GED classes as well as degree and certification programs provided by Harper.

Figure 66: Education Attainment of Workers Employed in the Harper College District

Education Attainment Level	2012		2017		Change 2012-2017
	Count	Percent	Count	Percent	Count
Less than high school	24,098	9.0%	28,417	10.0%	4,319
High school or equivalent, no college	45,548	17.0%	49,508	17.5%	3,960
Some college or Associate degree	62,124	23.2%	64,691	22.8%	2,567
Bachelor's degree or advanced degree	79,600	29.8%	80,070	28.2%	470

Source: U.S. Census Bureau, Local Employment Dynamics, Work Area Profile, 2019.

With a couple of exceptions, three commuter categories experienced net increases between 2012 and 2017 in the three broad industry groups listed in Figure 67. In the "Goods Producing" commuter group, workers commuting to jobs within the district increased substantially (3,889 or 11.5%), while resident workers commuting outside increased but by a much smaller margin (1,731 or 7.8%). In the "Trade, Transportation and Utilities" group, commuters into the district increased by 2,235 or 4.3% and residents working within the district also grew by 633 (4.4%). Those in the "All Other Services" group that commute outside the district and those living outside the district and commuting in increased by 6,945 (7.8%) and 9,401 (8.1%), respectively.

Figure 67: Commuting Characteristics of Worker by Industry Class, 2012-2017

Industry Group	Commuter Origination	Numeric Change	Percent Change
Goods Producing	Residents Commuting Outside the District	1,731	7.8%
	Commuters into the District	3,889	11.5%
	Residents working within District	-716	-6.3%
Trade, Transportation, and Utilities	Residents Commuting Outside the District	-77	-0.2%
	Commuters into the District	2,235	4.3%
	Residents working within District	633	4.4%
All Other Services	Residents Commuting Outside the District	6,925	7.8%
	Commuters into the District	9,401	8.1%
	Residents working within District	-422	-1.0%

Source: US Census Bureau, Local Origination Destination Employment Data, 2012-2017, All Private Jobs.

Because Baby Boomers are staying in the workforce longer and since there are more of them, age has a disproportionate influence on the region's commuter profile. Figure 68 shows commuter origination data by age group and all have declined except for those 55 or older. This data reflects changes between 2012 and 2017, so there are an additional 51,183 workers over the age of 55 that are employed or residing in the Harper district. The net loss of workers under age 55 represents 42,674 jobs, the majority of which are workers between the ages of 30 and 54. However, what about the proportion of those aged 55 or older compared to the remaining Harper market? In 2012 the proportion of jobs held by those aged 55 or older was 21.1% or 92,071 jobs. Workers aged 29 or younger were at 20.0%, or 87,175 jobs, and those middle-aged held the remaining 55.1%, or 240,112. In 2017, the middle-aged group had declined to 54.8%, or 238,504 jobs. Young workers increased to 21.5%, or 93,682 jobs. Those aged 55 or older increased to 25.7% of the workforce, or 111,781 jobs.

Figure 68: Net Change in Commuting Workers by Age Group, 2012-2017
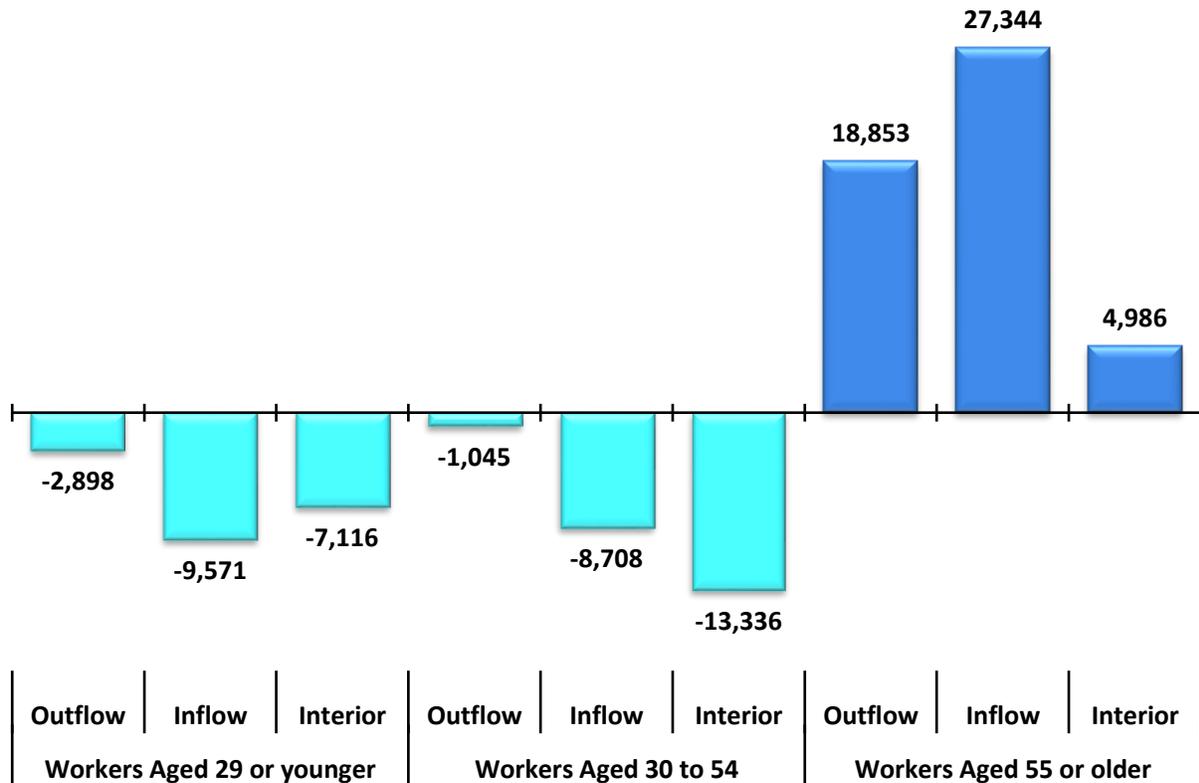
Source: US Census Bureau, Local Household Employment Dynamics, 2019.

Currently Available Jobs

The real-time demand for workers, as well as the required skills, credentials, and other attributes can now be assessed through web-based technologies that scan millions of job and applicant postings on popular sites such as Monster, SimplyHired, and Indeed or posted by various state and local employment bureaus. Labor Insight™, developed by Burning Glass Technologies, is one such tool for measuring current demand for workers across a broad variety of industries and occupations. While some employers do not post job listings on public job sites, it does give a sense of the types of jobs available within the Harper Community College District. A complete listing will be provided separately in the form of an Excel workbook.

The top advertised occupations in the Harper District cover a wide range of occupations, but show a strong demand in the sales, general office support, production and maintenance fields (Figure 69).

Figure 69: Top Occupations by Number of Job Postings - Harper College District

SOC Code	Occupation Title	Job Postings
53-3032	Heavy and Tractor-Trailer Truck Drivers	24,994
41-4012	Sales Reps, Wholesale and Manufacturing, Except Tech and Scientific Products	18,669
41-2031	Retail Salespersons	18,386
43-4051	Customer Service Representatives	15,725
29-1141	Registered Nurses	10,099
41-1011	First-Line Supervisors of Retail Sales Workers	9,005
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	8,437
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	7,253
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	6,912
11-9051	Food Service Managers	5,805
15-1151	Computer User Support Specialists	5,429
35-3031	Waiters and Waitresses	5,400
49-9071	Maintenance and Repair Workers, General	5,381
31-1014	Nursing Assistants	5,009
13-1071	Human Resources Specialists	4,999
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	4,851
33-9032	Security Guards	4,552
43-3031	Bookkeeping, Accounting, and Auditing Clerks	4,541
35-2014	Cooks, Restaurant	4,474
39-9011	Childcare Workers	3,935

Note: Based on information taken from job postings for the period of June 1, 2018 through June 30, 2019.
Source: Labor Insight Jobs (Burning Glass Technologies), 2019.

The high number of postings for truck drivers is reflective of the nationwide demand for professional drivers, as well as the Chicago area's position as an important transportation and distribution center. Job posting data can be useful in identifying immediate workforce needs of local employers. However, it should be noted that some industries tend to advertise online more often than others who rely on word-of-mouth, professional associations, or other outlets to market openings.

Current Demand for Workers

The real-time demand for workers, as well as required skills, credentials and other attributes, can now be assessed through web-based technologies that scan millions of job and applicant postings on popular sites such as Monster, SimplyHired, and Indeed, or are posted by various state and local employment bureaus. Labor Insight™, developed by Burning Glass Technologies and Economic Modeling Specialists, Inc. (EMSI), has created statistical tools for measuring current demand for workers across a broad variety of industries and occupations. Although some employers do not post job listings on public job sites, these listings provide a sense of the types of jobs available within the Harper Service Area.

Figure 70 represents the industries that have the greatest job posting activity in the Harper Service Area. The most salient findings are the number of postings from trucking, transportation and logistics firms accounted for 122,000 postings, and various healthcare institutions (e.g., hospitals and ambulatory centers, home health care and physician clinics) with 66,000 job postings. Also, of note, employment placement agencies and temporary help services accounted for over 114,000 postings between June 2018 and June 2019. There are several possible explanations for this. First, the Chicago metro area is one of the largest and most dynamic labor markets in North America. Because of this, employers and search firms are looking for local job seekers for positions both inside and outside the region. Second, as companies have downsized or outsourced many of their ancillary functions, such as human resources, they are increasingly relying on these firms to take over much of the hiring process. Finally, it may also be symptomatic

of the growth of the "on-demand" economy with many companies using temporary or contractor workers rather than permanent employees[18].

Figure 70: Top Industries Seeking Employees - 2019

Top Industries	Unique Job Postings
Employment Placement Agencies	80,547
Specialized Freight (except Used Goods) Trucking, Long-Distance	52,779
Temporary Help Services	33,633
Full-Service Restaurants	29,790
General Freight Trucking, Long-Distance, Truckload	29,178
All Other Support Services	27,519
Software Publishers	23,432
Custom Computer Programming Services	17,334
Computer Systems Design Services	17,225
General Medical and Surgical Hospitals	16,044
Administrative Management and General Management Consulting Services	14,894
All Other Miscellaneous Ambulatory Health Care Services	14,535
Home Health Care Services	14,057
Commercial Banking	13,691
Elementary and Secondary Schools	13,406

Note: Based on information taken from job postings for the period of June 1, 2018 through June 30, 2019.
Source: Labor Insight Jobs (Burning Glass Technologies), 2019.

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[18] In 2019, over 216,000 were people employed through employment placement agencies, temporary help services, and professional employer organizations in Illinois. Between 2010 and 2019, employment increased by approximately 55,000 or 342%, making it one of the fastest growing industry sectors in the State, according to estimates by Economic Modeling Specialists, Inc. (EMSI).

When analyzing the top skills requested by employers, duplication is very evident as most job ads list multiple skillsets. Figure 71 gives a sense of the kinds of skills that employers are seeking in new employees, although it is difficult to assess how, and to what degree, employers evaluate these skills (e.g., it could be based on the applicant's on-the-job experience, credentials obtained, pre-employment testing, etc.). However, 'soft-skills' or 'people skills' (such as customer service, customer contact, sales and relationship building) are highly valued for a wide range of jobs. These skills are more value-oriented but educational programs could integrate instilling values, such as ethics and professionalism. Furthermore, some aspects of customer service or sales also involve increased use of technology (e.g., social media marketing). Community colleges can recruit additional students by offering more credentialed courses for this sector.

Figure 71: Top Skills by Number of Job Openings, Harper Region (June 2018 – June 2019)

Top Skills	Total Citations
Customer Service	77,898
Sales	54,190
Scheduling	44,182
Cleaning	27,638
Repair	27,406
Retail Industry Knowledge	26,712
Customer Contact	25,900
Administrative Support	17,385
Lifting Ability	17,367
Data Entry	15,994
Cardiopulmonary Resuscitation (CPR)	14,256
Patient Care	14,003
Merchandising	13,740
Product Sales	13,485
Customer Billing	12,379

Criteria: Education: Less than a bachelor's degree (inferred).
Source: Burning Glass, Labor Insight™, 2019.

The certifications listed in Figure 72 were found within the job postings and are ranked according to the number of postings in which they appeared. Registered nurses and other related healthcare certifications appeared most frequently. This is not surprising as the healthcare sector has exhibited substantial job growth, and there are several major hospitals and clinics the region. Certifications for truck drivers and couriers (CLD Class A) also are featured prominently.

Figure 72: Top Certifications Sought by Employers - 2019

Certification Listed	Total Citations
Driver's License	42,260
CDL Class A	19,963
First Aid CPR AED	9,998
Registered Nurse	8,398
Certified Nursing Assistant	4,048
Food Handler Certification	3,823
Basic Life Saving (BLS)	3,390
Licensed Practical Nurse (LPN)	2,296
Advanced Cardiac Life Support (ACLS) Certification	2,285
Certified Medical Assistant	2,096
SERV Safe	2,083
Basic Cardiac Life Support Certification	1,737
Pharmacy Technician Certification Board (PTCB)	1,620
Forklift Operator Certification	1,558
Food Service Certification	1,502
Automotive Service Excellence (ASE) Certification	1,440
Emergency Medical Technician (EMT)	1,272
Certified Pharmacy Technician	1,050
Insurance License	1,043
Security Clearance	1,037
Property and Casualty License	1,016
American Registry of Radiologic Technologists (ARRT) Certification	1,015

Note: Based on information taken from job postings for the period of June 1, 2018 through June 30, 2019.
Source: Labor Insight Jobs (Burning Glass Technologies), 2019.

The decline in unemployment throughout the region and the general tightening of the labor market in recent years has made it more difficult to fill critical positions in a timely manner. This includes not only relatively higher-paid and higher-skilled jobs, such as registered nurses and human resources specialists, but also many middle-skilled and entry-level positions like customer service representatives, nursing and medical assistants, and truck drivers (Figure 73).

Figure 73: Hard to Fill Positions Based on Number of Job Postings and Time to Fill, Harper Region

Occupation Title	# Job Postings	Time to Fill	BLS/OES Salary
Heavy and Tractor-Trailer Truck Drivers*	24,994	41 days	$48,650
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products*	18,669	39 days	$68,510
Retail Salespersons	18,386	35 days	$28,710
Customer Service Representatives*	15,725	33 days	$37,840
Registered Nurses*	10,099	41 days	$73,890
First-Line Supervisors of Retail Sales Workers*	9,005	42 days	$42,880
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive*	8,437	28 days	$37,930
Laborers and Freight, Stock, and Material Movers, Hand	7,253	35 days	$30,140
Combined Food Preparation and Serving Workers, Including Fast Food	6,912	40 days	$22,240
Food Service Managers*	5,805	43 days	$51,440
Computer User Support Specialists*	5,429	33 days	$53,020
Waiters and Waitresses	5,400	42 days	$22,900
Maintenance and Repair Workers, General	5,381	43 days	$44,420
Nursing Assistants*	5,009	39 days	$28,810
Human Resources Specialists*	4,999	33 days	$62,410
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	4,851	36 days	$30,410
Security Guards*	4,552	35 days	$33,560
Bookkeeping, Accounting, and Auditing Clerks*	4,541	29 days	$42,520
Cooks, Restaurant*	4,474	45 days	$27,720
Childcare Workers*	3,935	47 days	$24,250

(June 2018 – June 2019)

*Position maps to a degree, transfer track or certification program offered by Harper College.
Criteria: Time Frame: June 1, 2018 - June 30, 2019; Education: Less than a bachelor's degree (inferred); High school or vocational training or associate degree (specified).
Source: Burning Glass, Labor Insight™, 2019.

Workforce Trends

Occupational Employment

The Harper District, along with the State of Illinois, is still experiencing slower job growth in relation to neighboring states and the nation, a situation that is being compounded by the continuing decline in the working-age population. In general, many professional, management and technical occupations, especially those related to finance, engineering and computer science, experienced a net loss in the number of jobs between 2010 and 2019 (Figure 74).

Figure 74: Percentage Change in Occupations that Map to Harper Degree

SOC	Description	Jobs (2019)	2010-2019 % Change	2019-2029 % Change
43-9061	Office Clerks, General	89,121	2.1%	-2.3%
29-1141	Registered Nurses	70,156	12.4%	8.3%
11-1021	General and Operations Managers	65,573	30.5%	3.3%
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	38,154	10.1%	-2.7%
33-9032	Security Guards	33,853	16.6%	8.6%
49-9071	Maintenance and Repair Workers, General	33,356	11.0%	4.9%
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	33,264	-3.3%	-4.9%
13-2011	Accountants and Auditors	32,780	17.0%	5.8%
25-1099	Postsecondary Teachers	32,036	4.6%	10.7%
25-9041	Teacher Assistants	29,067	6.4%	5.8%
25-2021	Elementary School Teachers, Except Special Education	28,964	-5.5%	3.5%
41-3099	Sales Representatives, Services, All Other	28,721	76.5%	3.7%
31-1014	Nursing Assistants	28,063	5.5%	10.8%
11-9199	Managers, All Other	27,864	36.9%	1.0%
43-3031	Bookkeeping, Accounting, and Auditing Clerks	25,939	-13.0%	-0.8%
35-2014	Cooks, Restaurant	25,453	50.0%	12.8%
13-1111	Management Analysts	24,815	22.5%	7.7%
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	19,787	-0.6%	3.9%
33-3051	Police and Sheriff's Patrol Officers	17,997	0.7%	2.4%
15-1132	Software Developers, Applications	17,921	85.6%	24.3%

Source: EMSI, 2019.

Full list available in Appendix F.

While the job growth outlook appears brighter over the next 10 years for many of these fields, others may continue to experience no growth or declines as automation reduces the human labor necessary to perform many of their required tasks. These fields include frontline clerical occupations (e.g. secretaries and administrative assistants), blue collar production and service jobs (e.g. truck drivers) and even some healthcare professions (e.g. pharmacy technicians).

The Illinois Department of Employment Security (IDES) periodically issues forecasts of job openings for specific occupations. These forecasts are based on assumptions about future job creation resulting from economic growth and replacement needs, along with demographic trends and expected turnover caused by worker separations. These separations may be due to changing jobs or careers, relocating, or other voluntary or involuntary causes. When combined with information on local annual wages and national information on typical education, work experience, and on-the-job training, the IDES information is helpful for educational institutions when planning for future degree and certification programs and other technical and professional training. Figure 75 on the next page shows the occupations that typically require an associate level or post-secondary credential to obtain employment and relate to programs offered by the Harper College. It should be noted that many occupations that require Baccalaureate and higher credentials are included because they map to transfer-track programs offered by Harper. The occupations are ranked per the anticipated number of annual average job openings.

Figure 75: Top Occupations by Annual Openings, Typical Education, Work Experience and OJT Requirements*

Occupation Title	Job Openings (2018)		Typical Education Required**	Work Exp.***	Typical on-the-job Training****
	Total Openings	Percent Replacement			
Office Clerks, General	10,683	96.2%	HS	None	S
General and Operations Managers	5,975	84.5%	BA	5 years +	None
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	4,535	89.4%	HS	None	S
Registered Nurses	4,251	82.0%	BA	None	None
Cooks, Restaurant	3,996	84.5%	NC	< 5 years	M
Sales Representatives, Services, All Other	3,892	80.3%	HS	None	M
Maintenance and Repair Workers, General	3,433	91.9%	HS	None	M
Nursing Assistants	3,423	92.7%	PSND	None	None
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	3,415	97.6%	HS	None	M
Accountants and Auditors	3,210	88.2%	BA	None	None
Teacher Assistants	3,144	92.5%	SCND	None	None
Bookkeeping, Accounting, and Auditing Clerks	2,973	99.1%	SCND	None	M
Postsecondary Teachers	2,832	87.7%	PHD	None	None
Management Analysts	2,389	84.4%	BA	< 5 years	None
Managers, All Other	2,209	79.3%	BA	< 5 years	None
Elementary School Teachers, Except Special Education	2,185	94.2%	BA	None	None
First-Line Supervisors of Food Preparation and Serving Workers	2,104	89.9%	HS	< 5 years	None
Childcare Workers	2,047	89.9%	HS	None	S
First-Line Supervisors of Retail Sales Workers	1,938	97.4%	HS	< 5 years	None
Executive Secretaries and Executive Administrative Assistants	1,920	100.0%	HS	< 5 years	None
Software Developers, Applications	1,739	61.6%	BA	None	None
Insurance Sales Agents	1,692	85.4%	HS	None	M
Human Resources Specialists	1,508	80.2%	BA	None	None

* Occupations that map to Harper Degree, Transfer-Track or Certificate Programs.

**NC=No formal educational credential; HS=High school diploma or GED; SCND=Some college, no degree; BA= Baccalaureate degree; PHD=Doctoral or professional degree.

*** Work experience in a related occupation.

**** S = Short-term on-the-job training; M = Moderate-term on-the-job training; L = Long-term on-the-job training.

Source: U.S. Bureau of Labor Statistics; EMSI, Inc.; Illinois Department of Employment Security, 2019.

Full list available in Appendix G.

Occupational Wage Trends

Although wage growth has been slow following the recession, some bright spots have appeared recently. In the Harper region, occupations that are tied to transfer-track programs generally have the highest wages, as well as the strongest wage growth trends. This is especially true for those in engineering and computer science management (Figure 76). Those that typically require an associate degree or post-secondary credentials, with a few exceptions, have also followed this trend. Wage growth is a positive sign that will undoubtedly help attract more workers into these careers. However, there are several other trends that will present job seekers, employers, and higher education institutions with significant challenges going into the future.

Figure 76: Top Paid Occupations that Map to Harper Degree, Transfer-Track or Certificate Programs, by Job Count: Median Annual Wage, Percent Change 2014-2018

SOC Code	Occupation Title	2014 Median Annual Wage	2018 Median Annual Wage	Trend
11-1011	Chief Executives	$179,115	$235,154	31.3%
11-3021	Computer and Information Systems Managers	$125,262	$143,196	14.3%
11-9041	Architectural and Engineering Managers	$125,617	$132,278	5.3%
11-2022	Sales Managers	$112,270	$122,920	9.5%
33-1012	First-Line Supervisors of Police and Detectives	$113,848	$120,437	5.8%
11-3111	Compensation and Benefits Managers	$101,727	$119,651	17.6%
11-9121	Natural Sciences Managers	$125,629	$118,787	-5.4%
11-3131	Training and Development Managers	$102,796	$116,865	13.7%
15-1111	Computer and Information Research Scientists	$95,588	$115,491	20.8%
11-1021	General and Operations Managers	$99,940	$113,746	13.8%
11-3121	Human Resources Managers	$100,994	$113,376	12.3%
15-1133	Software Developers, Systems Software	$101,019	$112,582	11.4%
11-9111	Medical and Health Services Managers	$101,251	$110,181	8.8%
11-3061	Purchasing Managers	$98,509	$109,573	11.2%
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	$106,465	$106,782	0.3%
15-1122	Information Security Analysts	$95,815	$101,652	6.1%
11-3051	Industrial Production Managers	$92,200	$101,519	10.1%
13-2061	Financial Examiners	$88,305	$100,845	14.2%
17-2072	Electronics Engineers, Except Computer	$91,021	$100,593	10.5%
15-1132	Software Developers, Applications	$90,471	$100,008	10.5%

Source: EMSI, 2019.

Full list available in Appendix H.

The Aging of the Workforce

Most of the job openings over the next decade will result from the need to fill existing positions rather than from new jobs. Job openings created by workers retiring from existing positions are expected to outpace new job openings by a ratio of about two-to-one overall. Many, though not all, of the occupations with the highest expected replacement demands have a significant share of workers 55 and older. This includes jobs such as tax examiners and collectors, and revenue agents, bookkeeping, accounting, and auditing clerks, postsecondary teachers, and medical and health services managers, where 30% or more of current employees are 55 or older (Figure 77).

Figure 77: Employment Distribution by Age Group: Occupations that Map to Harper Degree, Transfer-Track or Certificate Programs, 2018*

SOC	Occupation	Total Jobs	< Age 25	Age 25-34	Age 35-44	Age 45-54	Age 55+
27-2042	Musicians and Singers	2,181	7.9%	18.7%	13.6%	15.0%	44.9%
11-1011	Chief Executives	5,199	0.4%	6.5%	20.3%	30.2%	42.6%
13-2081	Tax Examiners and Collectors, and Revenue Agents	563	1.4%	13.6%	21.2%	23.7%	40.0%
13-1051	Cost Estimators	2,590	2.8%	14.6%	18.9%	25.0%	38.7%
43-3031	Bookkeeping, Accounting, and Auditing Clerks	25,939	4.8%	16.0%	20.1%	24.2%	34.9%
11-9151	Social and Community Service Mgrs	2,730	2.2%	17.3%	21.2%	24.6%	34.5%
51-4022	Forging Machine Setters, Operators & Tenders, Metal and Plastic	450	5.6%	17.1%	18.9%	24.7%	33.8%
43-6013	Medical Secretaries	7,858	6.1%	17.9%	19.5%	22.8%	33.7%
11-3011	Administrative Services Managers	9,898	2.1%	12.4%	21.5%	30.4%	33.6%
13-2082	Tax Preparers	2,224	8.9%	24.8%	17.8%	14.9%	33.6%
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	38,154	6.7%	16.9%	19.6%	23.4%	33.4%
43-6011	Executive Secretaries and Administrative Assistants	16,134	6.6%	17.3%	19.5%	23.6%	32.9%
25-1099	Postsecondary Teachers	32,036	6.6%	21.3%	22.0%	17.7%	32.5%
41-9099	Sales & Related Workers, All Other	1,167	8.5%	20.6%	19.4%	19.2%	32.4%
11-9111	Medical & Health Services Mgrs	7,374	1.1%	14.9%	24.6%	27.4%	32.1%

Source: EMSI, 2019.

* Only top ranked occupations by the share of workers age 55 years and older are shown. A full list of occupations is available in Appendix I.

While the ongoing wave of retirements of older workers will offer ample opportunities for those entering the workforce or seeking new careers, qualifying for them may be much more challenging than in the past. The accelerating pace of automation and the adoption of new technologies (e.g. Artificial Intelligence and the Internet of Things) are expected to have a dramatic impact on employment and job-skills requirements. Although the true nature and scope of this impact is still uncertain, those entering the workforce as well as experienced mid-career workers will need continual education and training to remain competitive in their chosen occupation or to have an easier pathway to new careers as existing ones become obsolete.

Although robotics and automated systems have been ubiquitous in the automotive and electronics industries for several decades, automation and new technologies are making inroads into other sectors such as finance, insurance, and retailing, as well as many business and professional services. According to the global business consulting firm McKinsey & Company, not all the jobs being impacted are low-skill, low-wage jobs.[19] McKinsey's study of nearly 800 occupations in the U.S. found 2,000 individual work activities and assessed them against 18 different capabilities that could potentially be automated. Their analysis revealed that 45% of work activities could be automated based on proven technologies that currently exist. An additional 13% of work activities could also be automated if the technologies used to understand and process human language were brought up to the median human level of competence.

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[19] Michael Chui, James Manyika, and Mehdi Miremadi, *Four Fundamentals of Workplace Automation*, the McKinsey Quarterly, November 2015. Link: https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/four-fundamentals-of-workplace-automation.

Occupational Wages versus the "Living Wage"

As stated previously, wage growth has been slow coming out of the past recession despite record low unemployment and complaints of worker shortages in some quarters. At the same time, costs of housing, healthcare, and other necessities have been rising rapidly, especially in larger metro areas. One of the value propositions on higher education is preparing students for jobs that provide a significantly better standard of living. Therefore, it is important to consider the degree to which the occupations that map to higher education programs provide a reasonable standard of living.

Researchers at the Massachusetts Institute of Technology (MIT) created a "living wage" model as an alternative measure of basic needs. It draws upon geographically specific expenditure data related to a family's likely minimum food, childcare, health insurance, housing, transportation, and other necessities (e.g., clothing, personal care items, etc.) costs scaled to household size and the number of working adults in the household. The living wage draws on these cost elements and the rough effects of income and payroll taxes to determine the minimum employment earnings necessary to meet a family's basic needs while also maintaining self-sufficiency (Figure 78).

Figure 78: Annual "Living Wage" by Household Size, Chicago Metropolitan Area, 2019.

Number of Adults	Number of Children	Living Wage 2019*
1 Adult Working	No Children	$26,680
	1 Child	$53,920
	2 Children	$63,000
	3 Children	$77,440
2 Adults (1 Working)	No Children	$41,920
	1 Child	$49,280
	2 Children	$54,520
	3 Children	$60,520
2 Adults (Both Working)	No Children	$20,080
	1 Child	$29,300
	2 Children	$34,220
	3 Children	$39,540

*Estimated annual "living wage" for the Chicago metropolitan area, 2019.
Source: Living wage calculations obtained from the Living Wage Calculator, developed by Amy Glasmeier, Massachusetts Institute of Technology, available at https://livingwage.mit.edu/states/17.
Complete data for household variations made available in the Excel workbook provided to Harper.

Approximately half of the 164 occupations that map to Harper degree, certificate or transfer-track programs pay higher than the estimated "living wage" in the Chicago metro area across all household types. This is generally true for the transfer-track programs that ultimately lead to Baccalaureate or higher degrees. They are predominantly managerial, professional and technical occupations such as Computer and Information Systems Managers, Medical and Health Services Managers, Computer Programmers, and Buyers and Purchasing Agents. These jobs offer median annual wages that range from two to eight times higher than the living wage threshold for every household type.

Figure 79: Occupations with the Highest Percentage of the "Living Wage" by Household Type, Chicago Metropolitan Area, 2019.

Occupation Title	2018 Median Annual Wage	1 ADULT				2 ADULTS (1 WORKING)			
		0 Children	1 Child	2 Children	3 Children	0 Children	1 Child	2 Children	3 Children
Chief Executives	$235,154	847.5%	419.3%	358.9%	292.0%	539.4%	458.8%	414.7%	373.6%
Computer and Information Systems Managers	$143,196	516.1%	255.4%	218.6%	177.8%	328.5%	279.4%	252.5%	227.5%
Architectural and Engineering Managers	$132,278	476.7%	235.9%	201.9%	164.2%	303.4%	258.1%	233.3%	210.2%
Sales Managers	$122,920	443.0%	219.2%	187.6%	152.6%	281.9%	239.8%	216.8%	195.3%
Compensation and Benefits Managers	$119,651	431.2%	213.4%	182.6%	148.6%	274.4%	233.5%	211.0%	190.1%
Natural Sciences Managers	$118,787	428.1%	211.8%	181.3%	147.5%	272.5%	231.8%	209.5%	188.7%
Training and Development Managers	$116,865	421.2%	208.4%	178.4%	145.1%	268.1%	228.0%	206.1%	185.7%
Computer and Information Research Scientists	$115,491	416.2%	206.0%	176.3%	143.4%	264.9%	225.3%	203.7%	183.5%
General and Operations Managers	$113,746	409.9%	202.8%	173.6%	141.2%	260.9%	221.9%	200.6%	180.7%
Human Resources Managers	$113,376	408.6%	202.2%	173.0%	140.8%	260.1%	221.2%	200.0%	180.1%
Software Developers, Systems Software	$112,582	405.7%	200.8%	171.8%	139.8%	258.2%	219.7%	198.6%	178.9%
Medical and Health Services Managers	$110,181	397.1%	196.5%	168.2%	136.8%	252.7%	215.0%	194.3%	175.1%
Purchasing Managers	$109,573	394.9%	195.4%	167.2%	136.1%	251.3%	213.8%	193.2%	174.1%
Information Security Analysts	$101,652	366.3%	181.3%	155.1%	126.2%	233.2%	198.3%	179.3%	161.5%
Industrial Production Managers	$101,519	365.9%	181.0%	154.9%	126.1%	232.9%	198.1%	179.0%	161.3%
Financial Examiners	$100,845	363.4%	179.8%	153.9%	125.2%	231.3%	196.8%	177.9%	160.2%
Electronics Engineers, Except Computer	$100,593	362.5%	179.4%	153.5%	124.9%	230.7%	196.3%	177.4%	159.8%
Software Developers, Applications	$100,008	360.4%	178.3%	152.6%	124.2%	229.4%	195.1%	176.4%	158.9%
Art Directors	$96,455	347.6%	172.0%	147.2%	119.8%	221.2%	188.2%	170.1%	153.2%
Administrative Services Managers	$95,098	342.7%	169.6%	145.1%	118.1%	218.1%	185.6%	167.7%	151.1%
Construction Managers	$94,589	340.9%	168.7%	144.4%	117.4%	217.0%	184.6%	166.8%	150.3%
Transportation, Storage, and Distribution Managers	$94,159	339.3%	167.9%	143.7%	116.9%	216.0%	183.7%	166.1%	149.6%
Engineers, All Other	$91,519	329.8%	163.2%	139.7%	113.6%	209.9%	178.6%	161.4%	145.4%
Computer Programmers	$91,302	329.0%	162.8%	139.3%	113.4%	209.4%	178.1%	161.0%	145.1%
Tax Examiners and Collectors, and Revenue Agents	$87,149	314.1%	155.4%	133.0%	108.2%	199.9%	170.0%	153.7%	138.5%
Managers, All Other	$86,769	312.7%	154.7%	132.4%	107.7%	199.0%	169.3%	153.0%	137.9%

Source: Living wage calculations obtained from the Living Wage Calculator, developed by Amy Glasmeier, Massachusetts Institute of Technology, available at https://livingwage.mit.edu/states/17.

The balance of the occupations falls into two tiers. Those in the middle tier have an annual median wage that exceeds the living wage threshold for households that have either no children or have two working adults. For households that have only one working adult and multiple children, the annual wage is at or below the living wage threshold. The bottom tier of occupations includes many blue-collar trade and service occupations (such as Security Guards, Production Helpers, Ambulance Drivers and EMTs), as well as some business, technical, and personal service jobs (such as Teaching Assistants, Dietetic Technicians and Childcare Workers). These occupations generally pay wages that are below the estimated living wage for the region, regardless of household size or the number of working adults in the household.

Figure 80: Occupations with the Lowest Percentage of the "Living Wage" by Household Size, Chicago Metropolitan Area, 2019.

Occupation Title	2018 Median Annual Wage	1 ADULT			2 ADULTS (1 WORKING)			2 ADULTS (BOTH WORKING)		
		0 Children	1 Child	2 Children	0 Children	1 Child	2 Children	0 Children	1 Child	2 Children
Tax Preparers	$29,465	106.2%	52.5%	45.0%	67.6%	57.5%	52.0%	141.1%	96.7%	82.8%
Teacher Assistants	$28,025	101.0%	50.0%	42.8%	64.3%	54.7%	49.4%	134.2%	92.0%	78.7%
Dietetic Technicians	$26,622	95.9%	47.5%	40.6%	61.1%	51.9%	47.0%	127.5%	87.4%	74.8%
Security Guards	$29,147	105.0%	52.0%	44.5%	66.9%	56.9%	51.4%	139.6%	95.7%	81.9%
Childcare Workers	$23,439	84.5%	41.8%	35.8%	53.8%	45.7%	41.3%	112.2%	76.9%	65.9%
Sales and Related Workers, All Other	$29,723	107.1%	53.0%	45.4%	68.2%	58.0%	52.4%	142.3%	97.5%	83.5%
Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	$29,554	106.5%	52.7%	45.1%	67.8%	57.7%	52.1%	141.5%	97.0%	83.0%
Semiconductor Processors	$17,563	63.3%	31.3%	26.8%	40.3%	34.3%	31.0%	84.1%	57.6%	49.4%
Helpers--Production Workers	$27,099	97.7%	48.3%	41.4%	62.2%	52.9%	47.8%	129.8%	88.9%	76.1%
Ambulance Drivers and Attendants, Except Emergency Medical Technicians	$21,047	75.9%	37.5%	32.1%	48.3%	41.1%	37.1%	100.8%	69.1%	59.1%

Key: Figures between 100.0% and 150.0% of the "Living Wage" are highlighted in yellow; figures below 100.0% of the "Living Wage" are highlighted in orange.
Source: Living wage calculations obtained from the Living Wage Calculator, developed by Amy Glasmeier, Massachusetts Institute of Technology, available at https://livingwage.mit.edu/states/17.

Because of the range of household types used in the MIT model, it is difficult to make solid conclusions about the retention or exclusion of degree or certification programs. For recent graduates or those living with no dependents, it may be possible to achieve a decent standard of living working in a lower paying occupation over a short period of time if the opportunities for advancement in their chosen career field are plentiful and family formation can be delayed. For those students or prospective students that already have such obligations, the situation can be more challenging and may require shifting to a career field that provide a faster and higher rate of return.

In any event, this comparison underscores the necessity of households with children to have two working adults to achieve a modest standard of living in the Chicago metro area. This is also true for most large urban areas and has been cited as a cause of the outmigration of young families in recent years. Institutions of higher education can do little to control the costs of food, housing or other living expenses, but they can provide the training and skills to help students at any stage or situation of life to improve their standard of living. This information might be best used by institutions in advising students or prospective students in programs that will get them into a job that will be commensurate with their economic needs, as well as their career aspirations.

About the MIT Living Wage Model

Analysts and policy makers often compare income to the federal poverty threshold to determine an individual's ability to live within a certain standard of living. However, poverty thresholds do not account for living costs beyond a very basic food budget. The federal poverty measure does not take into consideration costs like childcare and health care that not only draw from one's income, but also are determining factors in one's ability to work and to endure the potential hardships associated with balancing employment and other aspects of everyday life. Further, poverty thresholds do not account for geographic variation in the cost of essential household expenses.

The MIT living wage model is an alternative measure of basic needs. It is a market-based approach that draws upon geographically specific expenditure data related to a family's likely minimum food, childcare, health insurance, housing, transportation, and other necessities (e.g. clothing, personal care items, etc.) costs. The living wage draws on these cost elements and the rough effects of income and payroll taxes to determine the minimum employment earnings necessary to meet a family's basic needs while also maintaining self-sufficiency.

The model generates a cost of living estimate that exceeds the federal poverty thresholds. As calculated, the living wage estimate accounts for the basic needs of a family. The living wage model does not include funds that cover what many may consider as necessities enjoyed by many Americans, such as pre-prepared meals or those eaten in restaurants. It also excludes money for entertainment, nor does it incorporate leisure time for unpaid vacations or holidays. Lastly, it does not allow for financial means to enable savings and investment or for the purchase of capital assets (e.g., provisions for retirement or home purchases). The living wage is the minimum income standard that, if met, draws a very fine line between the financial independence of the working poor and the need to seek out public assistance or suffer consistent and severe housing and food insecurity. Considering this fact, the living wage is perhaps better defined as a minimum subsistence wage for persons living in the United States.

Source: Massachusetts Institute of Technology, Living Wage Calculator, created by Dr. Amy Glasmeier, 2004.
Link: https://livingwage.mit.edu/pages/about, accessed on March 2, 2020.
Additional documentation may be accessed at: https://livingwage.mit.edu/resources/Living-Wage-User-Guide-and-Technical-Notes-2018.pdf.

Automation's Impact on the Workforce

Figure 81 compares the number of jobs in occupations that relate to Harper College program offerings with median annual earnings, their automation potential and rates the degree of relative potential disruption from low to high. The automation potential scores each occupation based on the job tasks that could be automated using currently available technologies. The nature of task automation varies based on the technologies being employed. In some cases, it could replace human labor or simply augment it, making workers more productive or relieving them of repetitive or potential injurious tasks. It will, undoubtedly, also require additional education or training to qualify for and perform successfully in the jobs in the future.

Figure 81: Automation Potential of Top Occupations that Map to Harper College Degree, Transfer-Track or Certificate Programs

SOC	Occupation	Jobs (2019)	Median Annual Earnings (2018)	Automation Potential
43-9061	Office Clerks, General	89,121	$36,805	96.0%
29-1141	Registered Nurses	70,156	$76,124	0.9%
11-1021	General and Operations Managers	65,573	$113,746	16.0%
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	38,154	$38,884	96.0%
33-9032	Security Guards	33,853	$29,147	84.0%
49-9071	Maintenance and Repair Workers, General	33,356	$44,504	64.0%
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	33,264	$60,524	85.0%
13-2011	Accountants and Auditors	32,780	$76,958	94.0%
25-1099	Postsecondary Teachers	32,036	$64,937	3.2%
25-9041	Teacher Assistants	29,067	$28,025	56.0%
25-2021	Elementary School Teachers, Except Special Education	28,964	$67,884	0.4%
41-3099	Sales Representatives, Services, All Other	28,721	$54,005	n/a
31-1014	Nursing Assistants	28,063	$29,645	5.5%
11-9199	Managers, All Other	27,864	$86,769	25.0%
51-9198	Helpers--Production Workers	27,099	$27,099	66.0%
43-3031	Bookkeeping, Accounting, and Auditing Clerks	25,939	$45,320	98.0%
35-2014	Cooks, Restaurant	25,453	$30,533	96.0%
13-1111	Management Analysts	24,815	$88,662	13.0%

Sources: US Bureau of Labor Statistics, 2014; O*Net; McKinsey Global Institute analysis.
Key to Automation:

Less than 25% = Low	25% to 49% = Moderate	50% to 74% = High-Moderate	Over 75% = High

A full list of occupations is available in Appendix J.

What is most notable about the McKinsey analysis is that automation potential does not necessarily correlate with low-skill, low-wage jobs. While fast food workers have an automation potential of 74%, and 81% heavy truck driving activities can be automated, there are also counter-examples. These include manual labor positions where only 7% of job tasks have the potential for automation and janitorial activities where only 22% could be automated. Likewise, high-paying jobs are not necessarily automation-proof. Doctors (23%) and even CEOs (25%) all have significant portions of their jobs that could be automated with current technology. In addition, almost half (47%) of what pharmacists do could be done by a robo-pharmacist, while 72% of commercial pilot activities could be also be automated.

In a similar fashion, middle-skilled jobs also face varying degrees of disruption from automation. Although the elimination of some jobs and occupations is to be expected, most will experience restructuring or the replacement of some activities.[20] Many of the occupations that typically require the training and credentials offered by community colleges have a moderate to high potential for disruption by automation.

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[20] A recent report by the Brookings Institute estimated that approximately one-quarter of U.S. employment (36 million jobs in 2016) will face high exposure to automation in the coming decades, with more than 70% of current task content at risk of substitution. In addition, some 36% of U.S. employment (52 million jobs in 2016) will experience medium exposure to automation by 2030, while another 39% (57 million jobs) will experience low exposure. Source: Maru, M., Maxim, R., and Whiton, J., *Automation and Artificial Intelligence: How Machines are Affecting People and Places*, Metropolitan Policy Program, Brookings Institute, January 2019.

In the healthcare industry, for example, occupations like phlebotomists (89%), medical transcriptionists (73%), medical assistants (53%), surgical technologists (52%), and nursing assistants (44%) have the greatest potential for automation. Others, such as registered nurses (1%), licensed practical and licensed vocational nurses (6%), psychiatric technicians (20%), respiratory therapy technicians (29%), and radiologic technologists (23%) appear to be less vulnerable.

Jobs of the Future

The World Economic Forum (WEF) predicted that the global workforce could lose 7.1 million jobs between 2015 and 2020—largely because more routine work will be automated. At the same time, there would be accelerated growth in the development of high-demand occupations or job specialties that did not exist 10 or even five years ago. The WEF also predicted that 65% of children now in primary school will one day work in jobs that do not yet exist.

For discussion: The WEF says changing business models and "jobs displacement" will create demand for training for new jobs as well as for "wholesale reskilling of existing workforces." Institutions will have to more nimbly adapt curricula for the skills that business and industry need. Automation and other trends will also affect campus jobs—changing the daily duties of everyone from the president on down.

Reprinted from SCUP: *The Future of Jobs: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution*, World Economic Forum, www3.weforum.org/docs/WEF_FOJ_ Executive_Summary_Jobs.pdf

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Much of the long-term decline in low- and middle-skilled production and service jobs has been driven by labor-substituting technologies as much as by more resource-efficient sustainable product use, lower demand growth in aging societies, and increasing global competition. However, increased demand for advanced materials and the potential of new technologies such as 3D printing, resource-efficient production, and robotics are strong drivers of employment growth. This is expected to lead to a transformation of manufacturing into a sophisticated sector where high-skilled engineers, skilled technicians, and specialists create and manage advanced and automated production systems.

Understanding the Impact of Automation

As firms adopt advanced technologies, the automation of work tasks may change employment and productivity levels and the skills needed in the workforce. "Automation" acts as a broad term to describe technological drivers of workforce changes, including but not limited to artificial intelligence; machine learning; robotics; autonomous transport; 3D printing; advanced manufacturing; advanced materials; computing power; and internet and cloud technology.

The automation potential scores cited in this report should not be interpreted as relation to the number of jobs that may be eliminated through the adoption of new technologies. Rather, they refer to the percentage of typical job tasks in an occupation that could be modified or eliminated by technologies that are currently available. In general, mundane repetitive tasks are more subject to automation, making workers more productive and freeing them up for more important tasks.

Career-long training and education will become standard, as automation will also require both new and seasoned workers to be more highly skilled and trained than in the past to work with new technologies. The challenge for educational institutions will be to work closely with local employers to respond rapidly with adequate training and credentialing programs as new technologies are implemented.

Additional resources:

"Harnessing Automation for a Future that Works", McKinsey Global Institute, January 2017. [https://www.mckinsey.com/featured-insights/digital-disruption/harnessing-automation-for-a-future-that-works];
"Four fundamentals of workplace automation", McKinsey Digital, November 2015. [https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/four-fundamentals-of-workplace-automation].

Program Gap Analysis

The program gap analysis connects Harper's degree, transfer-track and certificate program graduates, as well as its certification programs, non-credit offerings, and transfer-track degree programs, with the estimated annual job openings regardless of industry or program. In addition, it references graduates and other program completers from other institutions in the Harper region. It ranks programs according to supply/demand gaps (beyond normal labor market fluctuations) and connects this data to regional employment, wage, and workforce metrics. Taken together, they can be used (in conjunction with the institution's costs of program delivery) to identify programs for expansion, retention or realignment.

It should be noted that in making future program decisions, the supply/demand gaps must be interpreted carefully and in conjunction with the other metrics, as well as soliciting feedback from students, graduates and employers. For example, the local demand for some occupations (e.g., truck drivers, registered nurses) may be limited, but employment opportunities are plentiful in adjacent labor markets or have strong national demand. The reverse can also be true with programs where a high gap is indicated, but other institutions may be offering the needed education and training. Regarding the transfer-track programs, the data from EMSI and Illinois Community College Board does not distinguish between the number of graduates transferring to a four-year program versus those going into the job market. Finally, it does not consider customized training and other programs that address the upskilling of local businesses or industry sectors.

The analysis consists of two parts. The first identifies opportunities for new programs not currently offered by Harper, based on the supply/demand gap (i.e., the estimated number of job openings versus the number of individuals completing relevant programs). The second categorizes existing programs based on the same criteria[21].

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[21] Note that much of the data presented in this section is "cross-walked" between the Standard Occupational Codes (developed by the U.S. Bureau of Labor Statistics) and the Classification of Instructional Programs (developed by the U.S. Department of Education's National Center for Education Statistics). Tables that map Harper's (CIP) programs to Standard Occupational Codes are presented in Appendix B).

Supply/Demand Gaps: Potential Opportunities for New Programs

Because of the enrollment growth in the region, Harper College (unlike many of its peers around Illinois and the Midwest) has opportunities to expand its educational offerings beyond its existing programs. Based on analysis on estimated demand and supply factors (annual job openings and regional program completions) there are 18 programs mapping to 30 occupations, considering the workforce demands of the Harper region (Figure 82). Further research will be necessary to determine how or to what extent existing Harper programs or assets can be expanded or repurposed to accommodate these new opportunities, as well as the amount of capital investment that may be required for expansion. Further information can be found in the Appendix K.

Figure 82: New Program Opportunities

Program Description	Annual Job Openings	Regional Program Completions	Supply/ Demand Gap
Agricultural Business Technology	4,110	0	-4,110
Agricultural Mechanics and Equipment/Machine Technology	492	0	-492
Agroecology and Sustainable Agriculture	2,898	0	-2,898
Viticulture and Enology	2,935	0	-2,935
Agricultural and Food Products Processing	1,207	0	-1,207
Artificial Intelligence	2,474	0	-2,474
Information Technology	4,348	559	-3,789
Informatics	2,474	0	-2,474
Special Education and Teaching, General	2,855	390	-2,465
Counselor Education/School Counseling and Guidance Services	742	146	-596
Laser and Optical Engineering	3,329	0	-3,329
Telecommunications Engineering	3,429	0	-3,429
Environmental/Environmental Health Engineering	426	13	-413
Laser and Optical Technology/Technician	229	17	-212
Solar Energy Technology/Technician	724	0	-724
Water Quality and Wastewater Treatment Management and Recycling Technology/Technician	122	0	-122
Hydraulics and Fluid Power Technology/Technician	229	0	-229
Bioinformatics	2,616	51	-2,565

Source: CGS analysis of data from EMSI, Inc, 2019.
Full list available in Appendix K.

Additional Performance Measures for New Program Opportunities

Figure 83 contains additional metrics that compare performance based on job openings, the supply gap (the difference between job openings and program completions), projected job growth in the Harper region (future demand), and median hourly earnings to address some of the previously stated methodological concerns. An expanded set of tables with the data is included in the Excel spreadsheet provided to Harper College due to the size of the table.

Figure 83: New Program Rankings (Harper Region)

CIP	Program Description	Supply/Demand Gap	Annual Job Openings	Job Change 2019-2029	Median Hourly Earnings (2018)
11.0103	Information Technology	3,000 +	3,000 +	10.0% +	$25 +
01.0106	Agricultural Business Technology	3,000 +	3,000 +	5.0% - 9.9%	$25 +
14.1004	Telecommunications Engineering	3,000 +	3,000 +	5.0% - 9.9%	$25 +
14.1003	Laser and Optical Engineering	3,000 +	3,000 +	5.0% - 9.9%	$25 +
01.0309	Viticulture and Enology	1,000 - 2,999	1,000 - 2,999	10.0% +	$25 +
01.0308	Agroecology and Sustainable Agriculture	1,000 - 2,999	1,000 - 2,999	10.0% +	$25 +
13.1001	Special Education and Teaching, General	1,000 - 2,999	1,000 - 2,999	5.0% - 9.9%	$20 - $25
26.1103	Bioinformatics	1,000 - 2,999	1,000 - 2,999	10.0% +	$25 +
11.0102	Artificial Intelligence	1,000 - 2,999	1,000 - 2,999	10.0% +	$25 +
11.0104	Informatics	1,000 - 2,999	1,000 - 2,999	10.0% +	$25 +
01.0401	Agricultural and Food Products Processing	1,000 - 2,999	1,000 - 2,999	> 0%	$15 - $20
13.1101	Counselor Education/School Counseling and Guidance Services	500 - 999	500 - 999	5.0% - 9.9%	$25 +
15.0505	Solar Energy Technology/Technician	500 - 999	500 - 999	5.0% - 9.9%	$25 +
01.0205	Agricultural Mechanics and Equipment/Machine Technology	< 500	< 500	0.1% - 4.9%	$25 +
14.1401	Environmental/Environmental Health Engineering	< 500	< 500	> 0%	$25 +
15.0304	Laser and Optical Technology/Technician	< 500	< 500	> 0%	$25 +
15.1103	Hydraulics and Fluid Power Technology/Technician	< 500	< 500	> 0%	$25 +
15.0506	Water Quality and Wastewater Treatment Management and Recycling Technology/Technician	< 500	< 500	> 0%	$25 +

Source: CGS analysis of data from EMSI, 2019.

Program Supply/Demand Gaps: Existing Harper Programs

Across all award levels, 25 programs have a supply/demand gap of 400 or more, considering the workforce demands of the Harper region (Figure 84).

Figure 84: Significant Existing Program Gaps

Program Description	Demand	Supply		Supply/Demand Gap	
	Annual Openings (2018)	Harper Program Completions (2018)	Regional Program Completions (2018)	Regional (2018)	Harper % of Regional
Selling Skills and Sales Operations	22,958	3	10	22,948	30.0%
General Office Occupations and Clerical Services	19,559	10	10	19,549	100.0%
Sales, Distribution, and Marketing Operations, General	16,827	0	1	16,826	0.0%
Administrative Assistant and Secretarial Science, General	6,456	1	159	6,297	0.6%
Human Services, General	5,446	11	69	5,377	15.9%
Security and Loss Prevention Services	4,877	8	8	4,869	100.0%
Accounting Technology/Technician and Bookkeeping	4,811	79	199	4,612	39.7%
Culinary Arts/Chef Training	4,632	3	319	4,313	0.9%
Medical Administrative/Executive Assistant and Medical Secretary	4,368	9	10	4,358	90.0%
Registered Nursing/Registered Nurse	4,251	98	2,223	2,028	4.4%
Building/Property Maintenance	4,236	11	14	4,222	78.6%
Accounting	3,639	7	1,460	2,179	0.5%
Nursing Assistant/Aide and Patient Care Assistant/Aide	3,623	699	2,207	1,416	31.7%
Human Resources Management/ Personnel Administration, General	3,313	27	458	2,855	5.9%
Teacher Assistant/Aide	3,144	0	11	3,133	0.0%
Insurance	2,717	1	1	2,716	100.0%
Banking and Financial Support Services	2,524	1	1	2,523	100.0%
Elementary Education and Teaching	2,185	0	426	1,759	0.0%
Child Care Provider/Assistant	2,047	52	691	1,356	7.5%
Criminal Justice/Police Science	1,481	23	230	1,251	10.0%
Hospitality Administration/ Management, General	1,232	4	238	994	1.7%
Legal Assistant/Paralegal	1,211	49	240	971	20.4%
Parts, Warehousing, and Inventory Management Operations	793	110	113	680	97.3%
Baking and Pastry Arts/Baker/Pastry Chef	791	2	196	595	1.0%
Manufacturing Engineering Technology/Technician	460	39	41	419	95.1%

Source: EMSI, 2019.

Programs that Harper College should consider expanding include business and office, human services, manufacturing technology, corrections, and nursing. Programs that have a significant supply gap, but typically offer lower wages, include those in childcare and administrative assistants. Programs for these occupations could be good candidates for career pathway initiatives that help workers advance toward jobs that provide for economic self-sufficiency.

Based on the results of the program gap analysis, programs were classified according to level of supply and demand in the Harper region. Figure 85 categorizes existing Harper programs based on annual job openings, supply/demand gaps. These indicators are supplemented by projected job growth, wage trends, the share of aging workers, and automation potential. A complete set of indicators is included in the Excel spreadsheet provided to Harper College due to the size of the table.

Figure 85: Assessment of Existing Programs Based on the Results of the Program Gap Analysis

Tier 1 Programs with Opportunity for Growth (Large Supply/Demand Gap - Surplus of Demand over Supply)	
Accounting	Human Services, General
Accounting Technology/Technician and Bookkeeping	Insurance
Administrative Assistant and Secretarial Science, General	Legal Assistant/Paralegal
Baking and Pastry Arts/Baker/Pastry Chef	Manufacturing Engineering Technology/Technician
Banking and Financial Support Services	Medical Administrative/Executive Assistant and Medical Secretary
Building/Property Maintenance	Nursing Assistant/Aide and Patient Care Assistant/Aide
Child Care Provider/Assistant	Parts, Warehousing, and Inventory Management Operations
Criminal Justice/Police Science	Registered Nursing/Registered Nurse
Culinary Arts/Chef Training	Sales, Distribution, and Marketing Operations, General.
Elementary Education and Teaching.	Security and Loss Prevention Services
General Office Occupations and Clerical Services	Selling Skills and Sales Operations
Hospitality Administration/Management, General	Teacher Assistant/Aide
Human Resources Management/Personnel Administration, General	

Tier 2 Programs with Strong Local Demand (Significant Supply/Demand Gap - Surplus of Demand over Supply)	
Computer Numerically Controlled (CNC) Machinist Technology/CNC Machinist	Interior Design
Electrical/Electronic Equipment Installation and Repair, General	Junior High/Intermediate/Middle School Education and Teaching.
Environmental Control Technologies/Technicians, Other	Licensed Practical/Vocational Nurse Training
Fire Science/Firefighting	Medical/Clinical Assistant
Fire Services Administration.	Phlebotomy Technician/Phlebotomist
Graphic and Printing Equipment Operator, General Production	Purchasing, Procurement/Acquisitions and Contracts Management
Homeland Security	Secondary Education and Teaching

Tier 3 Programs with Low or Moderate Local Demand (Small Supply/Demand Gap - Surplus of Supply over Demand)	
Adult and Continuing Education and Teaching.	Health Information/Medical Records Administration/Administrator
Apparel and Textile Manufacture	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician
Architectural Drafting and Architectural CAD/CADD	Information Science/Studies
Business Administration and Management, General	Liberal Arts and Sciences/Liberal Studies
Commercial Photography	Machine Tool Technology/Machinist.
Computer Programming/Programmer, General	Massage Therapy/Therapeutic Massage
Dental Hygiene/Hygienist	Medical Insurance Coding Specialist/Coder
Diagnostic Medical Sonography/Sonographer and Ultrasound Technician	Music, General
Dietetic Technician	Prepress/Desktop Publishing and Digital Imaging Design
Early Childhood Education and Teaching.	Radiologic Technology/Science - Radiographer
Electrical, Electronic and Communications Engineering Technology/Technician	Sign Language Interpretation and Translation
Emergency Medical Technology/Technician (EMT Paramedic)	System, Networking, and LAN/WAN Management/Manager
Engineering, General	Web Page, Digital/Multimedia and Information Resources Design
Geographic Information Science and Cartography	

Tier 4 Programs that are At-Risk (Weak Local Demand/Surplus of Supply over Demand)	
Animation, Interactive Technology, Video Graphics and Special Effects	Fine/Studio Arts, General
Biological and Physical Sciences	Forensic Science and Technology
Cardiovascular Technology/Technologist	Industrial Electronics Technology/Technician
Community Health and Preventive Medicine	Information Science/Studies
Electromechanical and Instrumentation and Maintenance Technologies/Technicians, Other	Magnetic Resonance Imaging (MRI) Technology/Technician
Emergency Care Attendant (EMT Ambulance)	Medical Radiologic Technology/Science - Radiation Therapist
Fashion and Fabric Consultant	

Existing Harper Programs Mapped to Relevant Occupations

Thirty-nine programs, when classified by their instructional program (CIP) codes, were identified as Tier 1 or Tier 2 in the program gap analysis (Figure 86). These are programs that were identified as strong or having growth potential.

Figure 86: Programs with Opportunity for Growth (Large Supply/Demand Gap – Surplus of Demand over Supply)

CIP Code[1]	Description	Harper Program
12.0501	Baking and Pastry Arts/Baker/Pastry Chef	Certificate
12.0503	Culinary Arts/Chef Training	Certificate
13.1202	Elementary Education and Teaching	Associate, Transfer
13.1501	Teacher Assistant/Aide	Certificate
15.0613	Manufacturing Engineering Technology/Technician	Certificate, Associate, Apprenticeship, Transfer
19.0709	Child Care Provider/Assistant	Certificate
22.0302	Legal Assistant/Paralegal	Certificate, Associate, Transfer
43.0107	Criminal Justice/Police Science	Certificate, Associate, Transfer
43.0109	Security and Loss Prevention Services	Certificate
44.0000	Human Services, General	Certificate, Associate, Transfer
46.0401	Building/Property Maintenance	Certificate, Associate, Transfer
51.0716	Medical Administrative/Executive Assistant and Medical Secretary	Certificate, Associate
51.3801	Registered Nursing/Registered Nurse	Associate, Transfer
51.3902	Nursing Assistant/Aide and Patient Care Assistant/Aide	Certificate, Associate, Transfer
52.0301	Accounting	Certificate, Associate, Transfer
52.0302	Accounting Technology/Technician and Bookkeeping	Certificate, Associate
52.0401	Administrative Assistant and Secretarial Science, General	Certificate
52.0408	General Office Occupations and Clerical Services	Certificate
52.0409	Parts, Warehousing, and Inventory Management Operations	Certificate, Associate, Transfer
52.0803	Banking and Financial Support Services	Certificate
52.0901	Hospitality Administration/Management, General	Certificate, Associate, Transfer
52.1001	Human Resources Management/Personnel Administration, General	Certificate
52.1701	Insurance	Certificate
52.1801	Sales, Distribution, and Marketing Operations, General	Certificate, Associate, Transfer
52.1804	Selling Skills and Sales Operations	Certificate

[1] CIP refers to the Classification of Instructional Program code.

Figure 87: Programs with Strong Local Demand (Significant Supply/Demand Gap - Surplus of Demand over Supply)

CIP Code[1]	Description	Harper Program
10.0305	Graphic and Printing Equipment Operator, General Production	Certificate, Associate, Transfer
13.1203	Junior High/Intermediate/Middle School Education and Teaching	Associate, Transfer
13.1205	Secondary Education and Teaching	Associate, Transfer
15.0599	Environmental Control Technologies/Technicians, Other	Associate, Transfer
43.0202	Fire Services Administration	Certificate, Associate, Transfer
43.0203	Fire Science/Firefighting	Associate, Transfer
43.0301	Homeland Security	Associate, Transfer
47.0101	Electrical/Electronic Equipment Installation and Repair, General	Certificate, Associate, Transfer
48.0510	Computer Numerically Controlled (CNC) Machinist Technology/CNC Machinist	Certificate, Associate, Apprenticeship, Transfer
50.0408	Interior Design	Certificate, Associate, Transfer
51.0801	Medical/Clinical Assistant	Certificate
51.1009	Phlebotomy Technician/Phlebotomist	Certificate
51.3901	Licensed Practical/Vocational Nurse Training	Certificate, Associate
52.0202	Purchasing, Procurement/Acquisitions and Contracts Management	Certificate, Associate, Transfer

[1] CIP refers to the Classification of Instructional Program code.

Additional Performance Measures

Figure 88 contains additional metrics that compare performance based on job openings, the supply gap (the difference between job openings and program completions), projected job growth in the Harper Service Area (future demand), and median hourly earnings to address some of the previously stated methodological concerns. An expanded set of tables with the data is included in the Excel spreadsheet provided to Harper College due to the size of the table.

Figure 88: Program Rankings (Harper Service Area)

CIP Code[1]	Description	Supply Gap	Annual Openings	Job Growth (2019-2029)	Median Hourly Earnings
52.1804	Selling Skills and Sales Operations	5,000 +	5,000 +	0.1% - 4.9%	< $15
52.0408	General Office Occupations and Clerical Services	5,000 +	5,000 +	10.0% +	$15 - $20
52.1801	Sales, Distribution, and Marketing Operations, General	5,000 +	5,000 +	0.1% - 4.9%	$25 +
52.0401	Administrative Assistant and Secretarial Science, General	5,000 +	5,000 +	5.0% - 9.9%	< $15
44.0000	Human Services, General	5,000 +	5,000 +	> 0%	$25 +
43.0109	Security and Loss Prevention Services	1,000 - 4,999	1,000 - 4,999	10.0% +	< $15
52.0302	Accounting Technology/Technician and Bookkeeping	1,000 - 4,999	1,000 - 4,999	5.0% - 9.9%	$25 +
12.0503	Culinary Arts/Chef Training	1,000 - 4,999	1,000 - 4,999	0.1% - 4.9%	$25 +
51.0716	Medical Administrative/Executive Assistant and Medical Secretary	1,000 - 4,999	1,000 - 4,999	5.0% - 9.9%	< $15
51.3801	Registered Nursing/Registered Nurse	1,000 - 4,999	1,000 - 4,999	5.0% - 9.9%	$20 - $25
46.0401	Building/Property Maintenance	1,000 - 4,999	1,000 - 4,999	5.0% - 9.9%	$20 - $25
52.0301	Accounting	1,000 - 4,999	1,000 - 4,999	0.1% - 4.9%	$20 - $25
51.3902	Nursing Assistant/Aide and Patient Care Assistant/Aide	1,000 - 4,999	1,000 - 4,999	5.0% - 9.9%	$25 +
52.1001	Human Resources Management/Personnel Administration, General	1,000 - 4,999	1,000 - 4,999	10.0% +	< $15
13.1501	Teacher Assistant/Aide	1,000 - 4,999	1,000 - 4,999	5.0% - 9.9%	$25 +
52.1701	Insurance	1,000 - 4,999	1,000 - 4,999	0.1% - 4.9%	$20 - $25
52.0803	Banking and Financial Support Services	1,000 - 4,999	1,000 - 4,999	> 0%	$20 - $25
43.0301	Homeland Security	1,000 - 4,999	1,000 - 4,999	0.1% - 4.9%	$25 +

[1] CIP refers to the Classification of Instructional Program code.
Source: CGS analysis of data from EMSI, 2019.

Apprenticeship Availability

According to the latest information from the Illinois Department of Commerce and Economic Opportunity, 431 registered apprenticeship programs are available statewide with nearly 16,000 apprentices currently enrolled (Figure 89). Manufacturing and the construction trades account for a clear majority of programs and participants. The construction trades account for 39% of the apprenticeship programs and 86.0% of participants. Manufacturing accounted for 32.5% of apprenticeship programs but only 7.7% of total participants. This disparity may be symptomatic of manufacturing's ongoing challenges with attracting new workers, while construction's dominant position may be more the result of the industry's long history and experience with such programs.

Figure 89: Registered Apprenticeship Programs in Illinois by Industry

Industry Sector	Apprenticeship Programs		Program Participants	
	Number	Percent	Number	Percent
Agriculture	2	0.5%	1	0.0%
Utilities	27	6.3%	137	0.9%
Construction	168	39.0%	13,501	85.7%
Manufacturing	140	32.5%	1,215	7.7%
Wholesale-Retail Trade	5	1.2%	494	3.1%
Transportation	6	1.4%	24	0.2%
Services	47	10.9%	180	1.1%
Government	36	8.4%	202	1.3%
Total, All Industry Sectors	**431**	**100.0%**	**15,754**	**100.0%**

Source: Illinois Department of Commerce and Economic Opportunity, 2019.

Apprenticeships in the Spotlight

While the contours of President Trump's higher education policy are only starting to come into focus, in June, the president signed an executive order focused on expanding federal support for apprenticeships to train workers for unfilled jobs. The president wants business and higher education to partner to provide apprenticeship opportunities, and it is unclear whether he would propose new federal funding.

For discussion: While institutions like community colleges stand to benefit from federal interest in apprenticeships, other types of colleges and universities may need to do more to show how they contribute to workforce development. Is your institution positioned to claim a seat at the table when apprenticeships are discussed? What would be your institution's response to criticisms that "elite" institutions readily offer internships but do not do enough to sponsor blue-collar apprenticeships?

In Wisconsin, Trump Makes Case for Apprenticeships to Fill Jobs Gap, Ken Thomas and Josh Boak, Associated Press, *PBS NewsHour,* http://www.pbs.org/newshour/ rundown/wisconsin-trump-makes-case-apprenticeships-fill-jobs-gap/?

Appendix

Appendix A – Percent of Students Eligible for Free/Reduced Lunch Program, 2009-2019

District	School	2009	2019	% Change
River Trails SD 26	River Trails Learning Center at Parkview	0.0	63.6	63.6
Barrington CUSD 220	Barrington Early Learning Center	0.0	35.8	35.8
Palatine CCSD 15	John G Conyers Learning Academy	0.0	34.1	34.1
Comm Cons SD 59	Brentwood Elem School	21.2	50.7	29.5
Prospect Heights SD 23	Dwight D Eisenhower Elem School	4.9	32.6	27.7
Prospect Heights SD 23	MacArthur Middle School	5.8	33.5	27.7
Schaumburg CCSD 54	The District 54 Early Learning Center	0.0	26.0	26.0
Comm Cons SD 59	Grove Jr High School	30.6	56.3	25.7
Palatine CCSD 15	Winston Campus Elementary	16.8	41.3	24.5
Prospect Heights SD 23	Anne Sullivan Elem School	15.2	38.7	23.5
Prospect Heights SD 23	Betsy Ross Elem School	10	32.7	22.7
Wheeling CCSD 21	Walt Whitman Elem School	49.7	72.3	22.6
Township HSD 211	Palatine High School	32.5	55	22.5
Comm Cons SD 59	Juliette Low Elem School	42.7	65.2	22.5
Township HSD 211	Hoffman Estates High School	28.9	50.6	21.7
Palatine CCSD 15	Virginia Lake Elem School	43.1	64.2	21.1
Comm Cons SD 59	Clearmont Elem School	20.4	41.2	20.8
Comm Cons SD 59	Forest View Elem School	20.1	40.4	20.3
Schaumburg CCSD 54	Adlai Stevenson Elem School	8.8	29	20.2
Comm Cons SD 59	Devonshire School	34.9	54.6	19.7
Wheeling CCSD 21	J W Riley Elem School	4.4	24.1	19.7
Palatine CCSD 15	Kimball Hill Elem School	34.6	52.2	17.6
Comm Cons SD 59	Holmes Jr High School	42.9	60	17.1
Palatine CCSD 15	Gray M Sanborn Elem School	42.9	59.5	16.6
Comm Cons SD 59	Adm Richard E Byrd Elem School	50.7	66.8	16.1
Palatine CCSD 15	Carl Sandburg Jr High School	29.5	45.0	15.5
Wheeling CCSD 21	Cooper Middle School	22.0	37.4	15.4
Wheeling CCSD 21	Eugene Field Elem School	52.8	67.7	14.9
Wheeling CCSD 21	Edgar A Poe Elem School	17.6	32.5	14.9
Township HSD 211	J B Conant High School	13.0	27.9	14.9
Township HSD 211	Schaumburg High School	18.3	32.8	14.5
Schaumburg CCSD 54	Buzz Aldrin Elem School	8.2	22.1	13.9
Comm Cons SD 59	Rupley Elem School	57.5	71.4	13.9
Palatine CCSD 15	Stuart R Paddock School	28.2	41.8	13.6
Comm Cons SD 59	Friendship Jr High School	38.6	52.1	13.5
Palatine CCSD 15	Walter R Sundling Jr High Sch	18.7	31.2	12.5
Palatine CCSD 15	Thomas Jefferson Elem School	23.9	36.4	12.5

Comm Cons SD 59	Salt Creek Elem School	49.3	61.8	12.5
Palatine CCSD 15	Winston Campus Jr High	53.2	65.4	12.2
Schaumburg CCSD 54	Elizabeth Blackwell Elem School	10.8	22	11.2
Palatine CCSD 15	Jane Addams Elem School	55.4	66.5	11.1
Schaumburg CCSD 54	Lakeview Elem School	24.6	35.7	11.1
Schaumburg CCSD 54	Albert Einstein Elem School	16.4	27.4	11.0
Barrington CUSD 220	Arnett C Lines Elem School	5.4	16.2	10.8
Wheeling CCSD 21	Joyce Kilmer Elem School	40.5	51.0	10.5
Township HSD 214	Wheeling High School	26.3	36.6	10.3
Palatine CCSD 15	Central Road Elem School	28.2	38.3	10.1
Township HSD 214	Elk Grove High School	18.7	28.7	10.0
Barrington CUSD 220	Grove Avenue Elem School	7.3	17.2	9.9
Palatine CCSD 15	Lincoln Elementary School	37.7	47.3	9.6
Palatine CCSD 15	Frank C Whiteley Elem School	4.3	13.8	9.5
Schaumburg CCSD 54	Anne Fox Elem School	27.3	35.6	8.3
Schaumburg CCSD 54	Jane Addams JHS	9.2	17.1	7.9
Schaumburg CCSD 54	Margaret Mead JHS	4.1	12.0	7.9
Wheeling CCSD 21	Jack London Middle School	36.0	43.8	7.8
Schaumburg CCSD 54	Frederick Nerge Elem School	2.8	10.5	7.7
Wheeling CCSD 21	Henry W Longfellow Elem School	5.7	13.4	7.7
River Trails SD 26	River Trails Middle School	24.4	31.8	7.4
Comm Cons SD 59	Ridge Family Center for Learning	24.1	31.5	7.4
Township HSD 211	Wm Fremd High School	8.0	15.1	7.1
Palatine CCSD 15	Lake Louise Elem School	48.8	55.7	6.9
Barrington CUSD 220	Barrington High School	11.7	18.3	6.6
Schaumburg CCSD 54	Dwight D Eisenhower JHS	19.1	25.5	6.4
Schaumburg CCSD 54	Helen Keller JHS	14.4	20.5	6.1
Palatine CCSD 15	Marion Jordan Elem School	2.8	8.8	6.0
Palatine CCSD 15	Plum Grove Jr High School	7.4	13.4	6.0
Barrington CUSD 220	North Barrington Elem School	2.6	8.5	5.9
Barrington CUSD 220	Barrington Middle Sch Station	14.1	20.0	5.9
Schaumburg CCSD 54	Hanover Highlands Elem School	20.3	26.1	5.8
Comm Cons SD 59	John Jay Elem School	68.4	73.9	5.5
Palatine CCSD 15	Hunting Ridge Elem School	8.7	14.1	5.4
Schaumburg CCSD 54	Nathan Hale Elem School	6.2	11.6	5.4
Barrington CUSD 220	Sunny Hill Elem School	81.7	86.6	4.9
Mount Prospect SD 57	Fairview Elem School	5.6	10.1	4.5
Schaumburg CCSD 54	Robert Frost JHS	10.8	15.3	4.5
Barrington CUSD 220	Countryside Elem School	3.5	7.8	4.3
Schaumburg CCSD 54	Neil Armstrong Elem School	25.5	29.6	4.1
Wheeling CCSD 21	Robert Frost Elem School	48.5	52.6	4.1
Barrington CUSD 220	Barrington Mdle Sch- Prairie Cmps	15.0	19.0	4.0

Schaumburg CCSD 54	Lincoln Prairie School	1.5	5.4	3.9
Schaumburg CCSD 54	Adolph Link Elem School	4.1	8.0	3.9
Barrington CUSD 220	Roslyn Road Elem School	7.4	11.1	3.7
Township HSD 214	John Hersey High School	8.1	11.6	3.5
Arlington Heights SD 25	South Middle School	7.9	10.8	2.9
Arlington Heights SD 25	Greenbrier Elem School	2.1	5.0	2.9
Arlington Heights SD 25	Windsor Elementary School	6.6	9.4	2.8
Arlington Heights SD 25	Thomas Middle School	6.7	9.3	2.6
Mount Prospect SD 57	Lincoln Middle School	7.2	9.8	2.6
Township HSD 214	Buffalo Grove High School	13	15.5	2.5
Schaumburg CCSD 54	Everett Dirksen Elementary Sch	7.6	10.0	2.4
Mount Prospect SD 57	Lions Park Elem School	5.4	7.7	2.3
Schaumburg CCSD 54	John Muir Literacy Academy	31.6	33.8	2.2
Schaumburg CCSD 54	Michael Collins Elem School	5.9	7.9	2.0
Township HSD 214	Rolling Meadows High School	18.7	20.7	2.0
Wheeling CCSD 21	Booth Tarkington Elem School	32.4	34.0	1.6
Schaumburg CCSD 54	Fairview Elem School	6.6	8.0	1.4
Township HSD 214	Prospect High School	5.4	6.8	1.4
Schaumburg CCSD 54	Thomas Dooley Elem School	3.3	4.6	1.3
Barrington CUSD 220	Barbara B Rose Elem School	2.1	3.3	1.2
Schaumburg CCSD 54	Hoover Math and Science Academy	11.0	12.0	1.0
Palatine CCSD 15	Pleasant Hill Elem School	4.5	5.2	0.7
Arlington Heights SD 25	Dryden Elem School	6.0	6.6	0.6
Schaumburg CCSD 54	MacArthur International Spanish Academy	24.6	25.0	0.4
Schaumburg CCSD 54	Campanelli Elem School	7.5	7.5	0.0
River Trails SD 26	Indian Grove Elem School	11.1	10.8	-0.3
Comm Cons SD 59	Robert Frost Elem School	64.6	64.1	-0.5
Schaumburg CCSD 54	Enders-Salk Elem School	27.2	26.6	-0.6
Arlington Heights SD 25	Westgate Elem School	8.3	7.2	-1.1
Wheeling CCSD 21	Mark Twain Elem School	60.4	59.2	-1.2
Schaumburg CCSD 54	Winston Churchill Elem School	6.5	5.2	-1.3
Arlington Heights SD 25	Patton Elem School	7.3	5.4	-1.9
Arlington Heights SD 25	Ivy Hill Elem School	6.4	4.3	-2.1
Barrington CUSD 220	Hough Street Elem School	10.1	7.8	-2.3
Palatine CCSD 15	Willow Bend Elem School	20.7	18.4	-2.3
Arlington Heights SD 25	Olive-Mary Stitt School	5.9	3.3	-2.6
Wheeling CCSD 21	Oliver W Holmes Middle School	62.9	58.8	-4.1
Mount Prospect SD 57	Westbrook Early Learning Cntr	4.7	0.4	-4.3
River Trails SD 26	Euclid Elem School	55.8	41.9	-13.9

Appendix B – Food Stamp Recipients by Occupation

Occupation	Total on SNAP	Percent on SNAP
Agricultural inspectors	8	100.0%
Derrick, rotary drill, and service unit operators, and roustabouts, oil, gas, and mining	13	100.0%
Food cooking machine operators and tenders	82	100.0%
Fence erectors	84	81.6%
Helpers, construction trades	35	56.5%
Electronic home entertainment equipment installers and repairers	62	52.1%
Computer and information research scientists	20	46.5%
Crushing, grinding, polishing, mixing, and blending workers	113	43.6%
Other construction and related workers	42	42.4%
Automotive body and related repairers	167	38.2%
Coin, vending, and amusement machine servicers and repairers	76	37.8%
Hazardous materials removal workers	23	37.7%
Crane and tower operators	59	36.6%
Insulation workers	28	36.4%
Military, rank not specified	88	34.9%
Telephone operators	109	34.3%
Food processing workers, all other	105	33.9%
Gambling services workers	62	33.5%
Unemployed, with no work experience in the last 5 years or earlier or never worked	1,891	33.1%
Packaging and filling machine operators and tenders	555	29.4%
Model makers, patternmakers, and molding machine setters, metal and plastic	89	29.0%
Railroad conductors and yardmasters	26	28.6%
Dishwashers	354	28.3%
Roofers	293	27.8%
Cooks	2,401	26.9%
Drywall installers, ceiling tile installers, and tapers	120	26.5%
Mail clerks and mail machine operators, except postal service	145	26.4%
Bakers	256	26.0%
Power plant operators, distributors, and dispatchers	22	25.9%
Food preparation workers	935	25.6%
Tellers	405	25.2%
Dietitians and nutritionists	95	25.0%
Food servers, non-restaurant	198	24.6%
Laundry and dry-cleaning workers	241	24.1%
Helpers--production workers	85	24.1%

Cutting, punching, and press machine setters, operators, and tenders, metal & plastic	149	24.0%
Licensed practical and licensed vocational nurses	357	23.6%
Sewing machine operators	94	23.4%
Carpet, floor, and tile installers and finishers	105	23.0%
Dental assistants	236	22.6%
Packers and packagers, hand	842	22.4%
Door-to-door sales workers, news and street vendors, and related workers	149	22.2%
Janitors and building cleaners	2,398	22.1%
Postal service clerks	180	21.4%
Surveying and mapping technicians	36	21.3%
Telemarketers	144	21.1%
Industrial truck and tractor operators	572	21.1%
Bartenders	292	21.0%
Reservation and transportation ticket agents and travel clerks	150	21.0%
Crossing guards and flaggers	39	20.4%
Cashiers	3,457	20.3%
Other assemblers and fabricators	1,125	20.1%
Hosts and hostesses, restaurant, lounge, and coffee shop	256	20.0%
Other information and records clerks	84	20.0%
Cleaners of vehicles and equipment	353	19.9%
News analysts, reporters, and journalists	42	19.4%
Training and development specialists	100	19.1%
Food service managers	766	18.8%
Cutting workers	88	18.3%
Laborers and freight, stock, and material movers, hand	1,745	17.5%
Statistical assistants	20	17.4%
Structural metal fabricators and fitters	18	17.3%
Dining room and cafeteria attendants and bartender helpers	330	16.9%
Fire inspectors	14	16.7%
Opticians, dispensing	25	16.7%
Wholesale and retail buyers, except farm products	198	16.6%
Maids and housekeeping cleaners	855	16.4%
Tailors, dressmakers, and sewers	60	16.4%
Printing press operators	191	16.4%
First-line supervisors of food preparation and serving workers	308	16.2%
Sheet metal workers	70	16.0%
Welding, soldering, and brazing workers	278	16.0%
Tax preparers	99	15.6%
Counter and rental clerks	69	15.5%
Electrical, electronics, and electromechanical assemblers	112	15.0%
Heavy vehicle and mobile equipment service technicians and mechanics	72	15.0%

Butchers and other meat, poultry, and fish processing workers	111	14.9%
Clinical laboratory technologists and technicians	147	14.2%
Painting workers	16	13.9%
Animal trainers	21	13.9%
Motor vehicle operators, all other	18	13.6%
N/A (not applicable)	79,417	13.5%
Security guards and gaming surveillance officers	438	13.2%
Medical assistants	246	13.2%
Credit counselors and loan officers	230	13.1%
Inspectors, testers, sorters, samplers, and weighers	504	13.1%
Dental and ophthalmic laboratory technicians and medical appliance technicians	78	13.1%
Receptionists and information clerks	939	13.0%
First-line supervisors of mechanics, installers, and repairers	89	12.8%
Data entry keyers	308	12.6%
Other agricultural workers	70	12.5%
Transportation, storage, and distribution managers	136	12.4%
Cabinetmakers and bench carpenters	29	12.4%
Automotive service technicians and mechanics	371	12.1%
Home appliance repairers	35	12.0%
File clerks	123	11.9%
Waiters and waitresses	1,026	11.8%
Agents and business managers of artists, performers, and athletes	16	11.6%
Driver/sales workers and truck drivers	1,679	11.6%
Small engine mechanics	17	11.5%
Construction laborers	581	10.9%
Clergy	201	10.8%
Carpenters	676	10.7%
Travel agents	53	10.7%
Machinists	192	10.5%
Pressers, textile, garment, and related materials	19	10.3%
Hairdressers, hairstylists, and cosmetologists	434	10.3%
Claims adjusters, appraisers, examiners, and investigators	160	10.2%
Bus and truck mechanics and diesel engine specialists	63	10.2%
Hotel, motel, and resort desk clerks	63	10.1%
Weighers, measurers, checkers, and samplers, recordkeeping	37	10.1%
First-line supervisors of housekeeping and janitorial workers	86	10.1%
Postal service mail carriers	134	10.0%
Jewelers and precious stone and metal workers	21	9.9%
Childcare workers	667	9.9%
Customer service representatives	1,492	9.7%
Retail salespersons	1,611	9.4%

Shipping, receiving, and inventory clerks	344	9.1%
Residential advisors	15	9.1%
Billing and posting clerks	212	9.1%
Chemical processing machine setters, operators, and tenders	15	9.0%
Cargo and freight agents	38	9.0%
Telecommunications line installers and repairers	48	8.9%
Miscellaneous vehicle and mobile equipment mechanics, installers, and repairers	42	8.8%
Word processors and typists	128	8.8%
Other community and social service specialists	21	8.8%
Preschool and kindergarten teachers	192	8.6%
Bookkeeping, accounting, and auditing clerks	534	8.4%
Sales and related workers, all other	160	8.4%
Sales representatives of services, except advertising, insurance, financial svcs, travel	417	8.3%
Electricians	232	8.1%
Chemists and materials scientists	25	7.9%
First-line supervisors of production and operating workers	328	7.5%
Massage therapists	61	7.4%
Prepress technicians and workers	12	7.2%
Maintenance and repair workers, general	116	7.0%
Precision instrument and equipment repairers	15	6.8%
Correspondence clerks and order clerks	65	6.6%
Pest control workers	18	6.4%
Advertising sales agents	57	6.4%
Insurance claims and policy processing clerks	100	6.3%
Computer, automated teller, and office machine repairers	56	6.3%
Other life scientists	23	6.0%
Farmers, ranchers, and other agricultural managers	24	6.0%
Industrial production managers	72	5.9%
Industrial and refractory machinery mechanics	100	5.8%
Human resources workers	234	5.8%
Cost estimators	34	5.7%
Public relations specialists	34	5.6%
Religious workers, all other	17	5.6%
Flight attendants	47	5.6%
Paralegals and legal assistants	70	5.6%
Loan interviewers and clerks	23	5.4%
Payroll and timekeeping clerks	33	5.3%
Baggage porters, bellhops, and concierges	19	5.2%
Registered nurses	637	5.2%
Biological scientists	13	5.1%

First-line supervisors of retail sales workers	596	5.0%
Brickmasons, blockmasons, stonemasons, and reinforcing iron and rebar workers	19	5.0%
First-line supervisors of non-retail sales workers	309	5.0%
Barbers	17	4.8%
Phlebotomists	21	4.7%
Ushers, lobby attendants, and ticket takers	18	4.6%
Dental hygienists	35	4.6%
Chiropractors	21	4.4%
Social and human service assistants	22	4.4%
Computer programmers	134	4.4%
Bill and account collectors	30	4.3%
Human resources managers	70	4.3%
Producers and directors	20	4.3%
Radio and telecommunications equipment installers and repairers	33	4.3%
Compliance officers	39	4.2%
Civil engineers	65	4.2%
Insurance sales agents	100	4.2%
Office clerks, general	274	4.2%
Rail-track laying and maintenance equipment operators	5	4.1%
Library technicians	9	4.0%
Animal caretakers	41	3.9%
Tool and die makers	29	3.9%
Mechanical engineers	65	3.8%
Firefighters	46	3.8%
Interviewers, except eligibility and loan	18	3.8%
Aircraft pilots and flight engineers	23	3.7%
Production, planning, and expediting clerks	51	3.7%
Accountants and auditors	393	3.6%
Other therapists	19	3.6%
Social and community service managers	36	3.5%
Chefs and head cooks	56	3.5%
Postal service mail sorters, processors, and processing machine operators	15	3.4%
Computer support specialists	127	3.3%
Computer network architects	24	3.3%
Logisticians	23	3.2%
Other office and administrative support workers	82	3.1%
General and operations managers	138	3.1%
Operations research analysts	17	3.0%
Other financial clerks	23	3.0%
Construction managers	77	3.0%
Models, demonstrators, and product promoters	13	2.9%

Pharmacists	36	2.8%
Network and computer systems administrators	32	2.8%
First-line supervisors of construction trades and extraction workers	63	2.7%
Medical and health services managers	51	2.7%
Physical therapist assistants and aides	16	2.6%
Heating, air conditioning, and refrigeration mechanics and installers	42	2.6%
Meeting, convention, and event planners	16	2.4%
First-line supervisors of office and administrative support workers	146	2.3%
Lodging managers	8	2.3%
Speech-language pathologists	18	2.3%
Writers and authors	22	2.2%
Physical therapists	23	2.1%
Elementary and middle school teachers	305	2.1%
Sales representatives, wholesale and manufacturing	188	2.0%
Lawyers, and judges, magistrates, and other judicial workers	91	2.0%
Financial managers	132	2.0%
Chief executives and legislators	114	1.8%
Management analysts	92	1.7%
Education and childcare administrators	59	1.7%
Library assistants, clerical	13	1.6%
Other healthcare support workers	12	1.6%
Purchasing agents, except wholesale, retail, and farm products	28	1.4%
Real estate brokers and sales agents	39	1.4%
Special education teachers	22	1.1%
Computer systems analysts	42	1.1%
Property, real estate, and community association managers	16	0.8%
Couriers and messengers	4	0.4%
Secondary school teachers	15	0.3%

*The aggregated region consists of 2010 PUMA #3008, 3308, 3401, 3407, 3415, 3418, 3419, and 3602.

Source: IPUMS-USA, University of Minnesota, www.ipums.org, 2017 Five-Year American Community Survey.

Appendix C – Country of Origin (Harper PUMA Region)

Country of Origin	Number	Percent	Country of Origin	Number	Percent
Mexico	56,107	25.8%	Lebanon	428	0.2%
India	42,992	19.8%	Afghanistan	401	0.2%
Poland	20,186	9.3%	Colombia	389	0.2%
Philippines	8,361	3.8%	Ireland	380	0.2%
Ukraine	7,626	3.5%	Belize	362	0.2%
Korea	7,015	3.2%	Spain	355	0.2%
Bulgaria	6,585	3.0%	Laos	328	0.2%
China	5,531	2.5%	Armenia	325	0.1%
Russia	4,384	2.0%	Jordan	266	0.1%
Pakistan	4,028	1.9%	American Samoa	251	0.1%
Japan	3,686	1.7%	Argentina	241	0.1%
Romania	3,659	1.7%	Trinidad and Tobago	240	0.1%
Germany	3,151	1.4%	Panama	237	0.1%
United Kingdom	2,939	1.4%	Moldova	217	0.1%
Italy	2,858	1.3%	Sweden	207	0.1%
Nigeria	2,166	1.0%	France	192	0.1%
Albania	2,143	1.0%	Kenya	190	0.1%
Canada	1,939	0.9%	Hungary	177	0.1%
Greece	1,704	0.8%	Sri Lanka	163	0.1%
Honduras	1,630	0.7%	Croatia	148	0.1%
Vietnam	1,501	0.7%	Belgium	137	0.1%
Ecuador	1,495	0.7%	Tanzania	134	0.1%
Puerto Rico	1,392	0.6%	Dominican Republic	126	0.1%
Belarus	1,041	0.5%	Chile	123	0.1%
El Salvador	1,021	0.5%	Switzerland	121	0.1%
Yugoslavia	999	0.5%	Ghana	113	0.1%
Turkey	960	0.4%	Iran	111	0.1%
Macedonia	957	0.4%	Uzbekistan	105	0.0%
Guatemala	949	0.4%	Singapore	103	0.0%
Jamaica	888	0.4%	Haiti	89	0.0%
Brazil	880	0.4%	Zambia	88	0.0%
Azerbaijan	842	0.4%	Myanmar	80	0.0%
Bosnia and Herzegovina	795	0.4%	Costa Rica	78	0.0%
Iraq	795	0.4%	Thailand	77	0.0%
Hong Kong	726	0.3%	Bangladesh	76	0.0%
Nicaragua	694	0.3%	Bolivia	71	0.0%
Australia	680	0.3%	Malaysia	71	0.0%
Czech Republic	591	0.3%	Austria	67	0.0%
Peru	566	0.3%	Kazakhstan	65	0.0%
Lithuania	554	0.3%	Fiji	57	0.0%
Mongolia	554	0.3%	Venezuela	51	0.0%
Saudi Arabia	544	0.3%	South Africa	44	0.0%
Serbia	458	0.2%	Latvia	32	0.0%
Cuba	455	0.2%	Ethiopia	19	0.0%
Syria	445	0.2%			
Slovakia	431	0.2%			

Source: IPUMS USA, University of Minnesota, www.ipums.org.
Aggregated PUMA regions of 3308, 3401, 3415, 3417, 3418 and 3419.

Appendix D – Programs by Other Institutions Within 50 Miles

CIP Code	Program Name	Provider Name
10102	Agribusiness- Degree	Kishwaukee College
10102	Foundations of Agribusiness	Kishwaukee College
10103	Agriculture Business (AAS)- AG151	Joliet Junior College
10201	Precision Agriculture	Kishwaukee College
10204	Diesel Power/Equipment Repair	Kishwaukee College
10601	Horticulture Greenhouse	Kishwaukee College
10603	Horticulture Sustainable/General Degree	Kishwaukee College
10604	Greenhouse Operations (COC)-AG415	Joliet Junior College
10604	Greenhouse/Garden Center-	Kishwaukee College
10605	Landscape Maintenance Cert 21HH	College of Lake County
10605	Landscape Design & Nursery Degree	Kishwaukee College
10605	Landscape Design and Plant ID	Kishwaukee College
10605	Sustainable Horticulture	Kishwaukee College
10606	Horticulture Nursery Operation (COC)-AG715	Joliet Junior College
10607	Horticulture Turfgrass Operations (COC)-AG905	Joliet Junior College
10699	Horticulture Production (COA)-AG580	Joliet Junior College
11001	HACCP (Hazard Analysis of Critical Control Points)	BD Food Safety Consultants
11001	Implementing SQF Systems - Practitioner	Food Safety & Quality Systems
11002	Foreign Supplier Verification (FSVP) Program	BD Food Safety Consultants
11002	FSPCA Preventive Controls for Human Food (PCQI)	IIT - Institute for Food Safety and Health
30103	Environmental Studies, B.S.	Northern Illinois University
30201	Natural Areas Management AAS 21HP	College of Lake County
30206	Geographical Information Analysis, Graduate	Northern Illinois University
30206	Geographical Information Systems (GIS) Certification	Northern Illinois University
90102	Communication Studies, B.A. or B.S.	Northern Illinois University
90199	Communication (Bachelor of Arts)	Governors State University
90702	Digital Marketing Certified Associate	COMNet Group Inc.
90702	Audio Production Technology	Waubonsee Community College
90999	Integrated Marketing Communications	DePaul University
100303	Graphics and Desktop Publishing	Moraine Valley Community College
100304	Game Design and Development -	College of DuPage
100304	Comm Design-Videography & Motion Graphics	Elgin Comm. College District #509
100304	Animation	Waubonsee Community College
109999	Digital Marketing Strategy Program	DePaul University
109999	Computer Engineering Technology-Software Option	Joliet Junior College
110101	IT Management/PMP	Computer Training Source, Inc.
110101	PMP, Six Sigma, MS Project, MySQL Program	Computer Training Source, Inc.
110101	Project Management Professional (PMP)	Computer Training Source, Inc.

110101	Database Administration Skills	Moraine Valley Community College
110101	Database Administration Professional	New Horizons
110101	Information Technology Specialist 3	New Horizons
110101	Information Technology Specialist -2	New Horizons
110101	Information Technology Specialist -5	New Horizons
110101	Information Technology Specialist 4	New Horizons
110101	Security IT Associate	New Horizons
110103	Cyber Security -Undergraduate	Chicago State University
110103	ITIL Foundations	COMNet Group Inc.
110103	Cybersecurity Risk Management Program	DePaul University
110103	Incident Response and Digital Forensics Program	DePaul University
110103	iOS Developer Program	DePaul University
110103	A+, Network+ with Cyber Security Technology	Illinois Institute of Technology
110103	Baking & Pastry - AAS (KKC)	Kennedy King College
110103	Computer Information Systems-Web Development	Kishwaukee College
110103	IT Management +3	MicroTrain Technologies
110103	CompTIA Complete Cybersecurity Bundle with Labs	Northeastern Illinois University
110199	Associate Database Administrator	Moraine Valley Community College
110201	Computerized Numerical Control AAS 24NA	College of Lake County
110201	Android or iPhone Software Development	COMNet Group Inc.
110201	Technical Business Management	COMNet Group Inc.
110201	Big Data Using Hadoop Program	DePaul University
110201	Data Science: Programming with Python Program	DePaul University
110201	DevOps Program	DePaul University
110201	Modern.NET Web Development Program	DePaul University
110201	Web Development Expert-eCon	eConsulting Group, Inc.
110201	Computer Information Systems - Advanced (TRC)	Harry S. Truman College
110201	Computer Information Systems	Harry S. Truman College
110201	Computer Information Systems - Basic (TRC)	Harry S. Truman College
110201	Database Security - Single Course	Illinois Institute of Technology
110201	Software Development +1	Illinois Institute of Technology
110201	Software Development +2	Illinois Institute of Technology
110201	Software Development +3	Illinois Institute of Technology
110201	Software Development - Professional	Illinois Institute of Technology
110201	Computer Information Systems Microcomputer	Joliet Junior College
110201	Computer Programming (AAS)-CO261	Joliet Junior College
110201	Computer Programming	Kishwaukee College
110201	Programming Fundamentals-	McHenry County College
110201	Information Technology Programming A.A.S.-PSC	Prairie State College
110201	Help Desk	South Suburban College
110202	Computer Information Systems (RJD)	Arturo Velasquez Institute
110202	JAVA Language	College of DuPage

110202	Software Development AAS Degree	College of DuPage
110202	C++ Programming Cert 22CO	College of Lake County
110202	Web Development with JavaScript and HTML5	DePaul University
110202	Adobe Creative Suite	Directions Training Center, Inc
110202	MCSA: SQL 2016 BI Development and MCSE	Directions Training Center, Inc
110202	MCSA: SQL 2016 Database Administration and MCSE	Directions Training Center, Inc
110202	MCSA: Web Applications and MCSD	Directions Training Center, Inc
110202	ASP.Net with C#	Illinois Institute of Technology
110202	C++ Programming	Illinois Institute of Technology
110202	Java/Data Analytics/Database Security	Illinois Institute of Technology
110202	Java/SQL Databases/Data Analytics	Illinois Institute of Technology
110202	CIS-Unix, C And C++ Specialist (COA)-CO880	Joliet Junior College
110202	Agile Full Stack Web & Hybrid Mobile App Dev	MicroTrain Technologies
110202	IT Management +4	MicroTrain Technologies
110202	CNC Machine Operations-NIMS Test Preparation	Oakton Community College
110202	Computer User Certifcate	Oakton Community College
110202	Programming	Prairie State College
110202	Computer Information Systems (RJD)	Richard J Daley College
110202	Computer Software Development (AAS)	Waubonsee Community College
110202	Computer Software Development	Waubonsee Community College
110203	SAP: All In One	AMFASOFT Corporation
110203	Java Programming - Associate Programmer	COMNet Group Inc.
110203	Quality Assurance -Manual and Automation Testing	COMNet Group Inc.
110203	VM Training +2	MicroTrain Technologies
110203	VM Training +3	MicroTrain Technologies
110299	Comprehensive Masters Program	Management and IT Solutions
110299	E-commerce (for Programmers) Webmaster	Management and IT Solutions
110299	Comprehensive Masters Program	Management and IT Solutions
110299	E-commerce (for Programmers) Webmaster	Management and IT Solutions
110299	Comprehensive Masters Program	Management and IT Solutions
110299	E-commerce (for Programmers) Webmaste	Management and IT Solutions
110299	Java SE 8	Northeastern Illinois University
110299	Computer Science, M.S.	Northern Illinois University
110401	Baking & Pastry-BC (KKC)	Kennedy King College
110401	Data Analytics - Bachelor's Degree	Rasmussen College
110501	Business Intelligence/Data Analytics (Power BI)	Able Career Institute
110501	Computer Forensics Analyst 22CT	College of Lake County
110501	Certified Business Analyst/Amazon Web Services	COMNet Group Inc.
110501	Agile/BA/CAP/PMP Program	Computer Training Source, Inc.
110501	Business Analysis/PMP	Computer Training Source, Inc.
110501	Management Analyst Training Program	Computer Training Source, Inc.
110501	PMP/Agile/Six Sigma/ITIL	Computer Training Source, Inc.

110501	Big Data Using Spark Program	DePaul University
110501	Business Analyst	DePaul University
110501	in Analytics	DePaul University
110501	Cloud Computing Technologies	DePaul University
110501	Fundamentals of Software Testing Program	DePaul University
110501	Online Practical Internet Marketing	DePaul University
110501	Practical Internet Marketing Program	DePaul University
110501	Bus Analysis, Agile Scrum, Six Sigma and MS Project	Directions Training Center, Inc
110501	Business Analyst and Agile Boot Camp	Directions Training Center, Inc
110501	MCSE: Productivity Solutions Expert	Directions Training Center, Inc
110501	Database Management Expert (incl) PMP	eConsulting Group, Inc.
110501	Bachelor of Science in Information Technology	Governors State University
110501	Information Security	Governors State University
110501	System Analysis - Career	Illinois Institute of Technology
110501	Systems Analysis +1	Illinois Institute of Technology
110501	Systems Analysis +2	Illinois Institute of Technology
110501	Systems Analysis +3	Illinois Institute of Technology
110501	Systems Analysis - Professional	Illinois Institute of Technology
110501	Management Program	IT Expert System, Inc
110501	Quality Analysis Program	IT Expert System, Inc
110501	PMP, Quality Management and ERP Combo	Management and IT Solutions
110501	PMP, Quality Management and ERP Combo	Management and IT Solutions
110501	PMP, Quality Management and ERP Combo	Management and IT Solutions
110601	3+1 Bachelor of Science in Computer Science	College of DuPage
110601	Application and Technical Support Specialist	College of DuPage
110601	Database Proficiency	College of DuPage
110601	Enterprise Database Proficiency	College of DuPage
110601	Microsoft Office Core Essentials	DONKA, Inc.
110601	Application Specialist ``	Kishwaukee College
110601	Microcomputer Applications	Kishwaukee College
110601	MOS Master Certification	MicroTrain Technologies
110601	MOS Master Certification +	MicroTrain Technologies
110601	Introduction to Office Technology	Northpointe Resources
110601	Microsoft Office Suite Tools	South Suburban College
110601	Office Software Specialist	Waubonsee Community College
110699	Computer Support (AAS)	Waubonsee Community College
110701	Digital Forensics VS	Elgin Comm. College District #509
110701	Computer Science (Bachelor of Science)	Governors State University
110701	Computer Science, B.S.	Northern Illinois University
110701	Computer Science BS	Rasmussen College
110701	Computer Science (Bachelor of Science)	University of St. Francis
110801	Web Client Developer	College of DuPage

110801	Web Programmer	College of DuPage
110801	Web Technician	College of DuPage
110801	Multimedia Presentations Cert 23TE	College of Lake County
110801	Web Programming Cert 22CN	College of Lake County
110801	Web Design and Development	COMNet Group Inc.
110801	Java Programming/Int Java/Project Mgmt for IT	Illinois Institute of Technology
110801	Web Design & Social Media (AAS)-CO801	Joliet Junior College
110801	Careerpro E-commerce Comp.	Management and IT Solutions
110801	Careerpro E-commerce Comp.	Management and IT Solutions
110801	Computer System Analysis Pro	Management and IT Solutions
110801	Web Design and Development	Management and IT Solutions
110801	Careerpro E-commerce Comp.	Management and IT Solutions
110801	Computer System Analysis Pro	Management and IT Solutions
110801	Web Design and Development	Management and IT Solutions
110801	Careerpro E-commerce Comp.	Management and IT Solutions
110801	Computer System Analysis Pro	Management and IT Solutions
110801	Web Design and Development	Management and IT Solutions
110801	Digital Media (AAS)	McHenry County College
110801	Microsoft Web Developer	McHenry County College
110801	Web Design	McHenry County College
110801	Website Designer	Moraine Valley Community College
110801	Advanced Web Site Development	Oakton Community College
110801	Web Programming - AAS	Rasmussen College
110802	Big Data Hadoop Developer or Administration	COMNet Group Inc.
110802	Database Management	COMNet Group Inc.
110802	ETL Ab Initio or MS SQL Server Admin	COMNet Group Inc.
110802	Oracle Database Administration (DBA) 12C or later	COMNet Group Inc.
110802	SAP ERP Management	COMNet Group Inc.
110802	SAP HANA / CRM / HCM / MM / SD / FICO / PP / QM	COMNet Group Inc.
110802	Data Analytics Course	Illinois Institute of Technology
110802	Data Center Operations and Mangement + 3	Illinois Institute of Technology
110802	Data Center Operations and Mangement +2	Illinois Institute of Technology
110802	Data Center Operations and Mangement - Career	Illinois Institute of Technology
110802	Data Center Operations and Mangement - Prof.	Illinois Institute of Technology
110802	Data Management and Analytics +2	Illinois Institute of Technology
110802	Data Management and Analytics +3	Illinois Institute of Technology
110802	Data Management and Analytics - Professional	Illinois Institute of Technology
110802	Oracle DBA and Oracle 11i Apps DBA combo	Management and IT Solutions
110802	Oracle DBA and Oracle 11i Apps DBA combo	Management and IT Solutions
110802	Oracle DBA and Oracle 11i Apps DBA combo	Management and IT Solutions
110802	Oracle DBA and Oracle 11i Apps DBA combo	Management and IT Solutions
110802	Oracle Database Administrator	Oakton Community College

110899	Quality Assurance and Software Testing	Management & Information Tech Solutions
110899	Quality Assurance and Software Testing	Management & IT Solutions
110899	Quality Assurance and Software Testing	Management and IT Solutions
110901	CCNA Security	Able Career Institute
110901	Cisco Certified Network Associate	Able Career Institute
110901	Microsoft Certified Solutions Associate	Able Career Institute
110901	CCNA - Internetworking Technician	College of DuPage
110901	CompTIA A+ and Network + PC Technician	College of DuPage
110901	Computer and Internetworking Technology	College of DuPage
110901	Network Professional	College of DuPage
110901	Computer Information Tech	College of Lake County
110901	Network Administration and Security Cert 22CK	College of Lake County
110901	CCNA - Cisco Certified Network Associate	COMNet Group Inc.
110901	Network+	COMNet Group Inc.
110901	CCNA & CCNP Combo-Part Time	Computer Training Institute of Chicago
110901	Predictive Analytics Program	DePaul University
110901	Technology and Innovation Program	DePaul University
110901	Computer Networking Career Series	Governors State University
110901	Network+ Certification Training I&II	Illinois Institute of Technology
110901	CIS-Computer & Network Security Specialist (COA)-	Joliet Junior College
110901	CIS-Computer and Network Security Specialist	Joliet Junior College
110901	CIS-Network Specialist Option (AAS)-CO230	Joliet Junior College
110901	Computer Engineering Technology-Systems Option	Joliet Junior College
110901	Computer Information Systems-Network Specialist	Joliet Junior College
110901	CISCO Networking	Kishwaukee College
110901	Network Administration and Security Cert 22CK	LakeShore Campus
110901	Networking Specialist	McHenry County College
110901	A +/ Network +	MicroTrain Technologies
110901	A+, Network +, MCP	MicroTrain Technologies
110901	CCNA	MicroTrain Technologies
110901	CCNA- Voice	MicroTrain Technologies
110901	CCNP	MicroTrain Technologies
110901	Cisco Basic (CCNA and 2 CompTIA Certifications)	MicroTrain Technologies
110901	Cisco Professional (CCNA + 2)	MicroTrain Technologies
110901	Computer Tech/Help Desk (A+, Net+, Security +)	MicroTrain Technologies
110901	Network +	MicroTrain Technologies
110901	Network +/ CCNA	MicroTrain Technologies
110901	Network Professional	MicroTrain Technologies
110901	Cisco Network Associate	Moraine Valley Community College
110901	LAN Technician	Moraine Valley Community College
110901	Cisco Certified Network Associate	National Able Network
110901	Cisco Certified Network Associate (CCNA)	Oakton Community College

110901	Network Security Administrator	Oakton Community College
110901	Web Site Support and Maintenance	Oakton Community College
110901	Networking Systems and Technologies Basic	Richard J Daley College
110901	Networking Systems Technologies -Advance	Richard J Daley College
110901	Cisco Networking Technician	South Suburban College
110901	Microsoft Networking Technician	South Suburban College
110901	Network Technician	South Suburban College
110901	Network Administration and Security Cert 22CK	College of Lake County
111001	CompTIA A+	Able Career Institute
111001	Enterprise System Administrator	College of DuPage
111001	CompTIA & MSA Combo-Part Time	Computer Training Institute of Chicago
111001	Microsoft Sharepoint & SQL Database Combo	Computer Training Institute of Chicago
111001	Adobe Certified Expert (ACE) Program-CTS	Computer Training Source, Inc.
111001	Certified Technical Trainer (CTT+)	Computer Training Source, Inc.
111001	Internet Marketing Program	Computer Training Source, Inc.
111001	IT Support Specialist Program	Computer Training Source, Inc.
111001	Networking Systems Technologies-BC	Harry S. Truman College
111001	Networking AAS	Wright College
111001	Networking Advanced	Wright College
111001	System Administration +1	Illinois Institute of Technology
111001	System Administration +2	Illinois Institute of Technology
111001	System Administration +3	Illinois Institute of Technology
111001	System Administration +5	Illinois Institute of Technology
111001	System Administration - Career	Illinois Institute of Technology
111001	System Administration - Professional	Illinois Institute of Technology
111001	Big Data & Database Management	IT Expert System, Inc
111001	System Engineering Program	IT Expert System, Inc
111001	Network Administration	Kishwaukee College
111001	Networking and Systems Administration-Degree	Kishwaukee College
111001	Network and Systems Administration	Management & Information Tech Solutions
111001	A+/ Network +/ MCSA	MicroTrain Technologies
111001	A+/MCSE	MicroTrain Technologies
111001	CCNA/CCNP	MicroTrain Technologies
111001	MCSA	MicroTrain Technologies
111001	MCSA/MCSE 2012	MicroTrain Technologies
111001	Network +/ MCSA	MicroTrain Technologies
111001	Network +/ MCSE	MicroTrain Technologies
111001	Network Administrator	Moraine Valley Community College
111001	Network and Systems Administrator	Morton College
111001	Cisco Network Associate	Prairie State College
111001	Information Technology Networking AAS	Prairie State College
111001	Network Security Specialist	Prairie State College

111001	Information Technology Management Bachelors	Rasmussen College
111001	Network Systems Administration	Rasmussen College
111001	Networking Basic	Richard J Daley College
111001	Networking AAS	Wright College
111001	Networking Advanced	Wright College
111001	Networking Basic	Wright College
111001	Cybersecurity BC	Wright College - North Campus
111001	Networking AAS	Wright College - North Campus
111001	Networking Advanced	Wright College - North Campus
111001	Networking Basic	Wright College - North Campus
111002	Help Desk Professional Comprehensive	COMNet Group Inc.
111002	CCNA + 3 classes	Directions Training Center, Inc
111002	MCSA: Windows Server, CCNA or VMware	Directions Training Center, Inc
111002	PMP, Certified Scrum Master, ITIL and MS Project	Directions Training Center, Inc
111002	Vmware Certified Professional (VCP6.5)	Directions Training Center, Inc
111002	A+/ Network+/MCITP/CCNA/PMP	MicroTrain Technologies
111002	A+/ Network+/MCSE	MicroTrain Technologies
111002	A+/Net+/MCP/CCNA	MicroTrain Technologies
111002	A+/Network +/ MCTS/ CCNA	MicroTrain Technologies
111002	CCNP-Routing	MicroTrain Technologies
111002	CCNP-Switching	MicroTrain Technologies
111002	MCSE / CCNA	MicroTrain Technologies
111002	Project Management Professional +1	MicroTrain Technologies
111002	Project Management Professional +4	MicroTrain Technologies
111002	Computer & Local Area Network Technician AAS	Moraine Valley Community College
111002	Computer Support Associate	Moraine Valley Community College
111002	Windows Server Administration	Oakton Community College
111002	Microsoft Certified System Engineer (MCSE)	South Suburban College
111003	CCNA Security	College of DuPage
111003	Cybersecurity Specialist	College of DuPage
111003	Cybersecurity (CISSP/CEH/CISA/CISM)	COMNet Group Inc.
111003	Security+	COMNet Group Inc.
111003	Agile/CISSP/ITIL/PMP	Computer Training Source, Inc.
111003	A+, Net +, Security + and ITIL Foundations	Directions Training Center, Inc
111003	CISSP certification	Directions Training Center, Inc
111003	CISSP, ITIL and PMP	Directions Training Center, Inc
111003	PMP and CISSP	Directions Training Center, Inc
111003	Cyber Security Management +1	Illinois Institute of Technology
111003	Cyber Security Management +2	Illinois Institute of Technology
111003	Cyber Security Management +3	Illinois Institute of Technology
111003	Cyber Security Management	Illinois Institute of Technology
111003	Cyber Security Technologies +1	Illinois Institute of Technology

111003	Cyber Security Technologies +2	Illinois Institute of Technology
111003	Cyber Security Technologies +3	Illinois Institute of Technology
111003	Cyber Security Technologies - Professional	Illinois Institute of Technology
111003	Network+/Cyber Security Tech/Project Mgmt for IT	Illinois Institute of Technology
111003	Cyber Security	McHenry County College
111003	Network Security (AAS)	McHenry County College
111003	A+, Security +, MCP	MicroTrain Technologies
111003	A+/ Security +	MicroTrain Technologies
111003	Cisco CCNA 6 Security	MicroTrain Technologies
111003	IT Security Specialist AAS	Moraine Valley Community College
111003	Network Security Associate	Moraine Valley Community College
111003	Cybersecurity, Graduate	Northern Illinois University
111003	Information Security BS	Rasmussen College
111004	Frontend Web Developer Program	Computer Training Source, Inc.
111004	Web Design Specialist Program	Computer Training Source, Inc.
111004	Web Professional Training Program	Computer Training Source, Inc.
111004	Web Development-BC	Harry S. Truman College
111004	Web Development Advanced	Wright College
111004	Web Development Associates of Applied Science	Wright College
111004	Web Development Basic	Wright College
111004	Web Design and Application Development	Illinois Institute of Technology
111004	Web Design and Application Development +1	Illinois Institute of Technology
111004	Web Design and Application Development +2	Illinois Institute of Technology
111004	Web Design and Application Development +3	Illinois Institute of Technology
111004	CIS-Webmaster Certification (COA)-CO850	Joliet Junior College
111004	Web Development-	Kishwaukee College
111004	Web Development	McHenry County College
111004	Website Developer	Moraine Valley Community College
111004	Web Site & Multimedia Design	Morton College
111004	Information Technology Web AAS	Prairie State College
111004	Web Developer Technician	Prairie State College
111004	Web Junior Technician	Prairie State College
111004	Web Master Technician	Prairie State College
111004	Web Authoring	Waubonsee Community College
111004	Web Site Design and Development (AAS)	Waubonsee Community College
111004	Web Development Advanced	Wright College
111004	Web Development Associates of Applied Science	Wright College
111004	Web Development Basic	Wright College
111004	Web Development Advanced	Wright College - North Campus
111004	Web Development Associates of Applied Science	Wright College - North Campus
111004	Web Development Basic	Wright College - North Campus
111005	Agile project Management (SAFe or DevOps)	COMNet Group Inc.

111005	Agile Project Management using SCRUM (CSM) or PMI-ACP	COMNet Group Inc.
111005	INFORMATION TECHNOLOGY MANAGEMENT	COMNet Group Inc.
111005	Project Management Professional (PMP)	COMNet Group Inc.
111005	Agile Camp SAFe 4 Advanced Scrum Master; (SASM)	Courtyard by Marriott Chicago/Glenview
111005	Agile Camp SAFe 4 Product Owner/Product Manager	Courtyard by Marriott Chicago/Glenview
111005	Agile Camp SAFe 4 Release Train Engineer (RTE)	Courtyard by Marriott Chicago/Glenview
111005	Agile Camp SAFeÂ® 4 Agilist (SA) /Leading SAFe	Courtyard by Marriott Chicago/Glenview
111005	Agile Camp SAFeÂ® 4 for Government Programs	Courtyard by Marriott Chicago/Glenview
111005	Agile Camp SAFe4 Certified DevOps Practitioner	Courtyard by Marriott Chicago/Glenview
111005	Agile Camp Scrum Master-SAFeÂ®; SSM Certification	Courtyard by Marriott Chicago/Glenview
111005	SAFeÂ® 4 for Architects (ARCH)	Courtyard by Marriott Chicago/Glenview
111005	PMP, Business Analysis, ITIL, Agile, Six Sigma & SharePoint	Directions Training Center, Inc
111005	Agile Expert (Scrum Master/PMI-ACP)	eConsulting Group, Inc.
111005	CAPM Exam Prep Course	Governors State University
111005	Agile Scrum Master Certified	Premier Technology Consultants, Inc.
111006	A+ Helpdesk Technician Program	Computer Training Source, Inc.
111006	PMP, Six Sigma Green Belt (CSSGB)	Computer Training Source, Inc.
111006	IT-Ready CSIS - CompTIA A+, Network+, Security+	Creating IT Futures
111006	CompTIA Certification: A+, Network+, Security +	Governors State University
111006	Help Desk Analyst: Tier 1 Support Specialist	McHenry County College
111006	Computer Support Associate	Prairie State College
111006	Computer Technician	Prairie State College
111006	Information Technology - Associate's Degree	Rasmussen College
111099	Certified Information System Security Pro- CISSP	College of DuPage
111099	Cloud Computing Technologies Program	DePaul University
111099	Data Science for Business Program	DePaul University
111099	Microsoft Azure Administrator Associate	Directions Training Center, Inc
111099	Project Management Expert (1002550)	eConsulting Group, Inc.
111099	Computer Technology	Elim Outreach Training Center
111099	A+/Network+/Intro Programming	Illinois Institute of Technology
111099	PMP MS Project ITIL Foundation/Practitioner Combo	Management & Information Tech Solutions
111099	PMP MS Project ITIL Foundation/Practitioner Combo	Management & IT Solutions
111099	PMP MS Project ITIL Foundation/Practitioner Combo	Management and IT Solutions
111099	A+/ Network +/ MCSE/CCNA	MicroTrain Technologies
111099	CCNA, CCNA Voice, Security +, VMware,PMP	MicroTrain Technologies
111099	IT Management +2	MicroTrain Technologies
111099	IT Management +5	MicroTrain Technologies
111099	IT Management +7	MicroTrain Technologies
111099	MCSE - Microsoft Certified Solutions Expert	MicroTrain Technologies
111099	Microsoft Associate	Moraine Valley Community College

111099	CAPM Exam Prep course	Premier Technology Consultants, Inc.
111099	IT Management +2	Premier Technology Consultants, Inc.
111099	IT Management +3	Premier Technology Consultants, Inc.
111099	IT Management +4	Premier Technology Consultants, Inc.
111099	IT Management +5	Premier Technology Consultants, Inc.
119999	SQL Server Business Intelligence Program	DePaul University
119999	SQL Server Database Administration Program	DePaul University
119999	Entry Level Microsoft Azure Developer Associate	Directions Training Center, Inc
119999	Healthcare IT Expert- CPHIMS Exam Prep (1006774)	eConsulting Group, Inc.
119999	Network Security Expert (1006769)	eConsulting Group, Inc.
119999	Computer Support Specialist	Illinois Manufacturing Foundation
119999	Geek Technology	McHenry County College
119999	Help Desk	McHenry County College
119999	Help Desk Technician (AAS)	McHenry County College
119999	PC Support Specialist	McHenry County College
119999	Computer Technician	Moraine Valley Community College
119999	Network System Administrator	New Horizons
119999	Electronics Computer Technician	Oakton Community College
119999	Office Technology	Triton College
120501	Baking & Pastry- AC (KKC)	Kennedy King College
120501	Baking and Pastry C306H	Triton College
120501	Culinary Arts Apprenticeship Program	United Youth of America, Inc.
120503	Culinary Arts Training Program	A Safe Haven Foundation
120503	Chef Training Program	Chinese American Service League
120503	Culinary Arts AAS Degree	College of DuPage
120503	Culinary Arts AAS	Elgin Comm. College District #509
120503	Culinary Arts - BC (KKC)	Kennedy King College
120503	Culinary Arts-AAS (KKC)	Kennedy King College
120503	Culinary Arts-AC (KKC)	Kennedy King College
120503	Foundations of Culinary Arts-	Kishwaukee College
120503	C420a Culinary Training	Triton College
120504	Hospitality and Culinary Management - AAS 22FB	College of Lake County
120504	Hospitality Manager 22FI	College of Lake County
120504	Hospitality Supervisor 22FG	College of Lake County
120504	Culinary Management-Restaurant Management AAS	Elgin Comm. College District #509
120504	Hospitality and Culinary Management - AAS 22FB	LakeShore Campus
120504	Hospitality Manager 22FI	LakeShore Campus
120504	Hospitality Supervisor 22FG	LakeShore Campus
120504	Culinary Management	McHenry County College
120505	Food Industry Credential Program (F-CEP)	Kennedy King College
129999	Hospitality Management (COC)-CA415	Joliet Junior College
130101	Teaching Online Utilizing Technology	College of DuPage

130501	Instructional Technology, M.S. Ed.	Northern Illinois University
131001	Special Education, B.S. Ed.	Northern Illinois University
131001	Special Education, M.S. Ed.	Northern Illinois University
131004	LBS1 Endorsement	Lewis University
131201	CERTIFIED PROPERTY SPECIALIST (CPS)	Lee & Grant
131202	Early Childhood Education (Bachelor of Arts)	Governors State University
131202	Elementary Education (Bachelor of Arts)	Governors State University
131202	Elementary Education, B.S. Ed.	Northern Illinois University
131203	Middle Level Teaching and Learning, B.S.Ed.	Northern Illinois University
131206	Teacher Licensure	Northern Illinois University
131305	Literacy Education, M.S. Ed.	Northern Illinois University
131305	Teacher Certification in English, Graduate Level	Northern Illinois University
131311	Math Education	Governors State University
131314	Physical Education, B.S. Ed	Northern Illinois University
131316	Teacher Certification, Secondary Science in Biology	Northern Illinois University
139999	4 Weeks CDL Program	Wolf Driving School
139999	5 Week CDL Program	Wolf Driving School
139999	6 Week CDL Program	Wolf Driving School
140101	Engineering Intern (EI) Review	Illinois Institute of Technology
140101	Professional Engineer (PE) Review	Illinois Institute of Technology
140101	Associate in Engineering Science Degree	Kishwaukee College
140801	FE (Fundamentals of Engineering) Review courses	Illinois Institute of Technology
140901	Computer Engineering Technology	Joliet Junior College
140903	Apple IOS App Development Boot Camp	Kennedy King College
140903	Software Application Development AAS	Rasmussen College
141001	Electronics Engineering Technology (AAS) - TE500	Joliet Junior College
141001	Electrical and Computer Engineering, B.S.	Northern Illinois University
141001	Electronics and Computer Technology, AAS Degree	Oakton Community College
141101	Computer-Aided Design & Manufacturing	Northern Illinois University
141101	Engineering Technology/Mechatronics	Triton College
141901	Mechanical Engineering, B.S.	Northern Illinois University
141901	Mechanical Engineering, Master of Science	Northern Illinois University
142701	Industrial and Systems Engineering, B.S	Northern Illinois University
143501	Basic Instrumentation Course	George E. Booth Co.
143501	Forklift Operator (Industrial)	Joliet Junior College
143501	Industrial and Systems Engineering	Northern Illinois University
143501	Lean Six Sigma, of Undergraduate Study	Northern Illinois University
143601	Project Management Series	MCC Shah Center
143601	CNC 203: CNC Programming, Setup and Operation	Symbol Training Institute
143601	CNC 204: CNC Advanced Programming	Symbol Training Institute
143601	CNC 303: CNC Technology with Lab	Symbol Training Institute
143601	CNC 304: CNC Machine Shop Lab	Symbol Training Institute

150000	Engineering Technology (AAS)	MCC at Woodstock North HS
150000	Engineering Technology (AAS)	McHenry County College
150303	Advanced Multi-Skilled Tech	College of DuPage
150303	Electronics Technology -	College of DuPage
150303	Industrial Controls and Automation -	College of DuPage
150303	Electrical Engineering Technology AAS 24ED	College of Lake County
150303	Electronics Technology Cert 24EF	College of Lake County
150303	Electrical/Electronic Automated Systems (AAS)	Joliet Junior College
150303	Electronics Technology Degree	Kishwaukee College
150303	Industrial Electronics	Kishwaukee College
150304	Lasers, Photonics and Optics Cert 24LA	College of Lake County
150305	Voice Over IP Telephony Specialist	College of DuPage
150399	Electricity and Electronics Technology	College of DuPage
150401	Biomedical Engineering Technology AAS Degree	College of DuPage
150403	Mechatronics Technology	College of DuPage
150405	Automated Manufacturing Systems	College of DuPage
150405	Mechatronics Technology Cert 24ZB	College of Lake County
150405	Industrial Automation	Kishwaukee College
150405	Robotics Systems Engineering (AAS)	McHenry County College
150405	Robotics Systems Programmer	McHenry County College
150405	Automation and Controls	Oakton Community College
150406	Automation, Robotics & Mechatronics AAS 24ZD	College of Lake County
150406	Automotive Maintenance/BC	Kennedy King College
150406	Automotive Technology- AAS	Kennedy King College
150499	CNC Machining	MCC at Woodstock North HS
150499	CNC Machining	McHenry County College
150501	Building Automation Systems	College of DuPage
150501	Stationary Engineer AAS Degree	Moraine Valley Community College
150501	Heating, Ventilation and Air Conditioning	Morton College
150503	Renewable Energy Technology	College of DuPage
150611	Welding Fabrication Technology AAS	Elgin Comm. College District #509
150613	Manufacturing Engineering Technology AAS Degree	College of DuPage
150613	Manufacturing Technology	College of DuPage
150613	CNC Programming/Operations Cert 24NG	College of Lake County
150613	CNC Operator BVS	Elgin Comm. College District #509
150613	Computer Integrated Manufacturing AAS	Elgin Comm. College District #509
150613	Computer Integrated Manufacturing VS	Elgin Comm. College District #509
150613	Industrial Manufacturing Technology AAS	Elgin Comm. College District #509
150613	Fast Track for Brake Press Operators	Jane Addams Resource Corp
150613	Orthotics & Prosthetics Tech (AAS)-TE120	Joliet Junior College
150613	Certified Production Tech-	Kishwaukee College
150613	Geometric Dimensioning & Tolerancing	MCC Shah Center

150613	Advanced Manufacturing	McHenry County College
150613	Manufacturing Management (AAS)	McHenry County College
150613	CNC/CAM Programming	Oakton Community College
150613	Manufacturing Technology, A.A.S. degree	Oakton Community College
150613	Manufacturing Technology -	Prairie State College
150613	Industrial Management and Applied Engineering	SIU-Joliet Junior College
150613	Manufacturing Basics Non Credit	South Suburban College
150613	Manufacturing Basics Credit	South Suburban College
150613	Industrial Management and Applied Engineering	Southern Illinois University - Carbondale
150613	CNC 205: CNC Technology With Quality Control	Symbol Training Institute
150613	QC 101: Quality Control for Manufacturing	Symbol Training Institute
150614	Welding Fast Track	Jane Addams Resource Corp
150614	Welding Fast Track	Jane Addams Resource Corp - Trng Site
150699	Industrial Management and Technology, B.S.	Northern Illinois University
150702	Food Quality Control/Assurance Lab Technician	Chicago Center for Arts and Technology
150702	Lean Six Sigma Green Belt (LSSGB)	COMNet Group Inc.
150702	Six Sigma Green Belt (SSGB)	Management Info Tech Solutions, Inc.
150702	Six Sigma Green Belt (SSGB)	Management & Information Tech Solutions
150702	Six Sigma Green Belt (SSGB)	Management & IT Solutions
150702	Six Sigma Green Belt (SSGB)	Management and IT Solutions
150702	Nondestructive Testing (NDT)	Moraine Valley Community College
150803	Automotive Technology (AAS)	Waubonsee Community College
150805	Mechanical Engineering Technology AAS 24MB	College of Lake County
150903	Process Operations Technology Program	Joliet Junior College
151001	Basic Construction (COC)-TE316	Joliet Junior College
151201	Digital Logic Devices Programming	College of DuPage
151202	Systems Support	College of DuPage
151202	Comp TIA A+	Harry S. Truman College
151202	CIS-Microcomputer Support Technician (COA)	Joliet Junior College
151202	VM Training +1	MicroTrain Technologies
151203	Computer Technician	Joliet Junior College
151204	A+ Certification	COMNet Group Inc.
151204	Agile Project Management using SCRUM (CSM)	COMNet Group Inc.
151204	Adobe Graphic Design & E-Learning Combo	Computer Training Institute of Chicago
151204	Big Data and NoSQL Program	DePaul University
151204	E-Commerce Program	IT Expert System, Inc
151204	Game Design and Development	Prairie State College
151204	Communications Technology Systems	South Technical Center
151299	Programming Expert (1006776)	eConsulting Group, Inc.
151302	Computer Aided Design	College of DuPage
151302	CAD 3D Parametric Cert 24DP	College of Lake County
151302	CAD AutoCAD Cert 24DQ	College of Lake County

151302	CAD Drafting Technology - Mechanical AAS 24DC	College of Lake County
151302	CAD Graphics, Animation, Presentation AAS 24DJ	College of Lake County
151302	AutoCad BVS	Elgin Comm. College District #509
151302	Computer Aided Design AAS	Elgin Comm. College District #509
151302	Computer Aided Design BVS	Elgin Comm. College District #509
151302	Practicing Professional ProE	Elgin Comm. College District #509
151302	Computer Aided Design and Drafting (AAS)-TE260	Joliet Junior College
151302	Computer Aided Design and Drafting MechDesign	Joliet Junior College
151302	Computer Aided Design and Drafting Mech Design	Joliet Junior College
151302	Computer-Aided Architectural Design Degree	Kishwaukee College
151302	Computer-aided Architectural Drafting	Kishwaukee College
151302	Computer-Aided Mechanical Design Degree	Kishwaukee College
151302	CAD Drafting Technology - Mechanical AAS 24DC	LakeShore Campus
151302	Architectural and Engineering Design Technology	McHenry County College
151302	CAD Drafting Technology - Mechanical AAS 24DC	College of Lake County
151302	Computer-Aided Design and Drafting	Waubonsee Community College
151303	CAD Architectural Cert 24DN	College of Lake County
151303	Computer Aided Design & Drafting - Architectural	Waubonsee Community College
151305	Basic Electronics (COC) - TE528	Joliet Junior College
151306	CAD SolidWorks Cert 24DS	College of Lake County
151306	CNC Production Technician	Kishwaukee College
151306	Computer Aided Mechanical Drafting	Kishwaukee College
151306	Blueprint Reading (non-credit)	MCC Shah Center
151306	Computer Aided Design & Drafting - Mechanical	Waubonsee Community College
151306	Computer-Aided Design and Drafting (AAS)	Waubonsee Community College
151399	Engineering Technology Design	Triton College
190604	IFMA's Facility Management Professional (FMP)	Northern Illinois University
190604	ProFM (TM) Credential Program	Northern Illinois University
190699	Occupational Skills - Auto Porter/detailer	Northpointe Resources
190699	Occupational Skills Development -Housekeeping	Northpointe Resources
190701	Human Development & Family Sciences, B.S.	Northern Illinois University
190708	Administration of an Early Childhood Center	College of DuPage
190709	Early Childhood Education and Care AAS Degree	College of DuPage
190709	Early Childhood Education AAS 25EA	College of Lake County
190709	Human Services - Children and Adolescents AAS	College of Lake County
190709	Early Childhood Education Degree	Kishwaukee College
220301	Legal Office Admin Technology Professional AAS	Elgin Comm. College District #509
220301	Legal Administrative Assistant (COA)-CO815	Joliet Junior College
220301	Legal Secretary	McHenry County College
220302	Paralegal Studies AAS Degree	College of DuPage
220302	Paralegal Studies	College of DuPage
220302	Legal Studies Cert 22PB	College of Lake County

220302	Paralegal Program	DePaul University
220302	Paralegal AAS	Elgin Comm. College District #509
220302	Paralegal BVS	Elgin Comm. College District #509
220302	Advanced Paralegal Course	Governors State University
220302	Paralegal Course	Governors State University
220302	Paralegal AAS	Harold Washington College
220302	Paralegal Studies (Bachelor of Arts)	Lewis University
220302	Paralegal (voucher included)	McHenry County College
220302	Paralegal Studies (AAS)	McHenry County College
220302	Legal Secretary Course	Northeastern Illinois University
220302	Paralegal/Legal Assistant through Adv Paralegal	Northeastern Illinois University
220302	Paralegal Studies Program	Oakton Community College
220302	Paralegal - AAS	Rasmussen College
220302	Paralegal Studies Program Post-Baccalaureate	Roosevelt University
220302	Paralegal / Legal Assistant	South Suburban College
220302	Paralegal Associate in Applied Science Degree	Waubonsee Community College
220302	Paralegal AAS	Wright College - North Campus
230101	Intensive English Program	Elgin Comm. College District #509
231303	Multimedia Communications Cert 23TH	College of Lake County
231303	Technical Communication Cert 23TG	College of Lake County
240102	Game Design and Development (COA)-CO524	Joliet Junior College
250301	Library & Information Technology	College of DuPage
250301	Library and Information Technology AAS Degree	College of DuPage
260101	Biological Sciences, B.S.	Northern Illinois University
260101	Biological Sciences, M.S.	Northern Illinois University
270101	Mathematics (Bachelor of Arts)	Governors State University
320101	COACH-Career Opportunity ACHievement	College of DuPage
320109	Academic English Language Studies (ELS)	College of DuPage
320199	Vocational Skills Program-Hospitality Skills 1	College of DuPage
340199	EKG Technician Certification Prep	Oakton Community College
340199	Dialysis Technician	Prairie State College
340199	Health Information Management BS	Rasmussen College
340199	Medical Billing and Insurance Specialist	Skokie Institute of Allied Health & Tech
340199	EKG Technician Program	Waubonsee Community College
400501	Chemistry, B.S.	Northern Illinois University
400801	Physics, B.S.	Northern Illinois University
410101	Histotechnology AAS	Elgin Comm. College District #509
410204	Radiography (Bachelor of Science)	University of St. Francis
410303	Quality Assurance Basic	Arturo Velasquez Institute
410303	Quality Assurance Basic	Richard J Daley College
420101	Psychology, B.A. or B.S.	Northern Illinois University
422803	Counseling, M.S. Ed.	Northern Illinois University

430103	Criminal Justice Studies-Corrections (COA)-SS175	Joliet Junior College
430103	Law Enforcement (AAS)-SS510	Joliet Junior College
430103	Bachelor of Arts in Criminal Justice	Lewis University
430103	Criminal Justice AAS	Rasmussen College
430103	Criminal Justice Leadership and Management BS	Rasmussen College
430104	Criminal Justice (Bachelor of Arts)	Governors State University
430104	Criminal Justice - General	Kishwaukee College
430106	Criminal Justice Forensic Tech Degree	Kishwaukee College
430107	Criminal Justice (Cert) 25CF	College of Lake County
430107	Criminal Justice AAS 25CE	College of Lake County
430107	Criminal Justice Program AAS	Elgin Comm. College District #509
430107	Law Enforcement (COA)-SS520	Joliet Junior College
430107	Criminal Justice (AAS)	McHenry County College
430107	Criminal Justice AAS 25CE	College of Lake County
430109	Security Officer Firearms Training PPSI 6	College of Lake County
430116	Associate of Applied Science in Digital Forensics	Elgin Comm. College District #509
430120	Emergency Dispatcher	McHenry County College
430199	Public Safety Communications BVS	Elgin Comm. College District #509
430199	Public Safety Communications VS	Elgin Comm. College District #509
430201	Fire Science and Safety VS	Elgin Comm. College District #509
430201	Fire Officer I	Waubonsee Community College
430201	Fire Science Technology (AAS)	Waubonsee Community College
430202	Fire Officer I BVS	Elgin Comm. College District #509
430203	Fire Science Technology AAS 25FB	College of Lake County
430203	Fire Science and Safety AAS	Elgin Comm. College District #509
430203	Fire Science BVS	Elgin Comm. College District #509
430203	Fire Science Technology (AAS)-FS300	Joliet Junior College
430203	Firefighter	Waubonsee Community College
439999	911 Public Safety Telecommunicator 1	College of DuPage
440000	Human Resource Assistant	America Business College, Inc
440401	Public Administration, Masters (M.P.A.)	Northern Illinois University
440701	Human Services Generalist AAS Degree	College of DuPage
440701	Human Services Generalist	College of DuPage
440701	General Human Services Cert 25HF	College of Lake County
440701	Human Services - Adult Service AAS 25HC	College of Lake County
440701	Human Services (AAS)	Waubonsee Community College
450701	Geographic Information Systems (GIS)	College of DuPage
451001	Political Science, B.A. or B.S.	Northern Illinois University
451101	Sociology, B.S. or B.A.	Northern Illinois University
460000	Core/Construction Technology	Associated Builders and Contractors
460000	Construction Management (AAS)-TE317	Joliet Junior College
460201	CORE/Carpentry Level 1	Associated Builders and Contractors

460201	Construction Carpentry	Dawson Technical Institute
460201	Woodworkers Training Program	Greater West Town
460201	Woodworkers Training Program	Greater West Town
460201	Woodworkers Training Program	Greater West Town Project - Youth
460201	Residential Carpentry Apprenticeship and Training	Sustainable Options for Urban Living
460201	CORE/Carpentry Level 1	The Fuller Center for Housing
460302	CORE/Electrical Level 1	Associated Builders and Contractors
460302	Industrial Electricity	Kishwaukee College
460401	Automated Industrial Tech	Kishwaukee College
460403	Security Officer Basic Training PPSI 5	College of Lake County
460403	Home Inspection	Joliet Junior College
460499	Home Inspection Training	Governors State University
460503	CORE/Plumbing	Associated Builders and Contractors
460503	Gas Utility Worker-Advanced	Dawson Technical Institute
460503	Plumbing and Fire Protection	Dawson Technical Institute
470101	Electrical/Electronics (COC)-TE410	Joliet Junior College
470104	A+ Certified Computer Technician (RJD)	Arturo Velasquez Institute
470104	Computer and Internetworking Technician	College of DuPage
470104	Desktop Support Technician 22CI	College of Lake County
470104	PC Technician -	Kishwaukee College
470104	A+	MicroTrain Technologies
470104	MOS Certification with A+	MicroTrain Technologies
470104	Computer Repair Technician (CRT)	Morton College
470104	A+ Computer Diagnostic Specialist	Oakton Community College
470104	Computer Electronics Technician	Prairie State College
470104	A+ Certified Computer Technician (RJD)	Richard J Daley College
470105	Electro-Mechanical Technology AAS Degree	College of DuPage
470105	Mechanical Maintenance	College of DuPage
470105	Process Control Instrumentation-	College of DuPage
470105	Programmable Controllers -	College of DuPage
470105	Electrical/Electronic Maintenance Cert 24EH	College of Lake County
470105	Industrial Electrical/Electronics (COA)-TE510	Joliet Junior College
470105	Industrial Maintenance Technician	McHenry County College
470105	Electronic Controls Technician	Moraine Valley Community College
470105	Automation Technology	Waubonsee Community College
470199	Electrical Construction and Maintenance (46.0399)	Coyne American Institute
470199	Electrical Construction and Maintenance (46.0399)	Coyne College
470199	Overhead Electrical Line Worker-Advanced	Dawson Technical Institute
470201	Heating & Air-Concitioner Install/Service	Chicago Professional Center
470201	Residential / Commercial HVAC Technician	Chicago Professional Center, Inc.
470201	HVACR - Energy Audit and Analysis	College of DuPage
470201	HVACR - Service Technician	College of DuPage

470201	HVACR - Stationary Operator	College of DuPage
470201	Commercial Refrigeration Technician 24RK	College of Lake County
470201	Electrical Troubleshooting Technician Cert 24RL	College of Lake County
470201	HVAC Light Commercial Cert 24RI	College of Lake County
470201	HVAC/R Installation Technician Cert 24RY	College of Lake County
470201	Residential Air Conditioning Technician Cert 24RN	College of Lake County
470201	Residential Heating Technician Cert 24RJ	College of Lake County
470201	Heating Air Conditioning & Refrigeration	Coyne American Institute
470201	Heating Air Conditioning & Refrigeration	Coyne College
470201	Energy Management AAS	Elgin Comm. College District #509
470201	Energy Management VS	Elgin Comm. College District #509
470201	Heating, Air Conditioning & Refrigeration - AAS	Elgin Comm. College District #509
470201	Light Commercial HVAC Service Tech VS	Elgin Comm. College District #509
470201	Renewable Energy Option AAS	Elgin Comm. College District #509
470201	Residential HVAC Service Technician BVS	Elgin Comm. College District #509
470201	Residential HVAC Systems BVS	Elgin Comm. College District #509
470201	Heating, Vent, Air Conditioning and Refrigeration	ETI School of Skilled Trades
470201	HVAC/R Certified Technician	Governors State University
470201	Heating, Vent, & Air Conditioning (HVAC) (COA)	Joliet Junior College
470201	Heating, Ventilation, and Air Conditioning (HVAC)	Joliet Junior College
470201	Air Conditioning and Refrigeration/AAS	Kennedy King College
470201	Air Conditioning and Refrigeration/AC	Kennedy King College
470201	Air Conditioning and Refrigeration/BC (commercial)	Kennedy King College
470201	Air Conditioning and Refrigeration/BC (Domestic)	Kennedy King College
470201	Air Conditioning and Refrigeration/BC (Heating)	Kennedy King College
470201	Advanced Air Conditioning Tech ()	Moraine Valley Community College
470201	Basic Air Conditioning Technician ()	Moraine Valley Community College
470201	Heating and Air Conditioning ()	Moraine Valley Community College
470201	Heating, Ventilation and Air Conditioning (AAS)	Waubonsee Community College
470201	Heating, Ventilation, and Air Conditioning	Waubonsee Community College
470201	The HVAC Technican Training Program	West Chicago Professional Center
470303	BSD Industries Robotics Technician Training Program	Arthur M. Brazier Foundation
470303	HVAC Technician / Electrician / Maintenance PLC	Chicago Professional Center
470303	Industrial Maintenance	Chicago Professional Center
470303	Maintenance	Chicago Professional Center
470303	Maintenance	Chicago Professional Center, Inc.
470303	Automated Electronic Systems BVS	Elgin Comm. College District #509
470303	Industrial Maintenance BVS	Elgin Comm. College District #509
470303	IST/Maintenance Technology AAS	Elgin Comm. College District #509
470303	Industrial Sewing Preparation	Gordie's Foundation Inc.
470303	Industrial Maintenance Technology (COC)-TE225	Joliet Junior College
470303	Industrial Maintenance Technology (AAS)-TE210	Joliet Junior College

470303	Industrial Maintenance Technology (COA)-TE220	Joliet Junior College
470303	Operations Engineering (AAS)-TE140	Joliet Junior College
470303	Operations Engineering (COA)-TE141	Joliet Junior College
470303	Operations Technician (AAS)-TE142	Joliet Junior College
470303	Operations Technician (COA)-TE143	Joliet Junior College
470303	Industrial Maintenance Technician	Moraine Valley Community College
470303	Integrated Systems Technology AAS	Moraine Valley Community College
470303	Mechanical and Fluid Power Maintenance	Moraine Valley Community College
470303	Heating, Ventilation & Air Conditioning	Prairie State College
470303	Industrial Electrician AAS	Prairie State College
470303	Industrial Maintenance Technician	Prairie State College
470303	Advanced Factory Automation	Richard J Daley College
470303	Basic of Factory Automation	Richard J Daley College
470399	PLC Technician	Moraine Valley Community College
470499	CNC Technician BC	Arturo Velasquez Institute
470499	CNC Technician BC	Richard J Daley College
470603	Automotive Collision Repair Technician AAS 24AN	College of Lake County
470603	Automotive Structural Repair Technician Cert 24AL	College of Lake County
470603	Automotive Technology/AC	Kennedy King College
470603	Collision Technology/AC	Kennedy King College
470603	Collision Repair & Refinishing Technology-Diploma	Lincoln College of Technology
470603	Automotive Technology (Advanced)	Olive Harvey College
470603	Automotive Technology (Basic)	Olive Harvey College
470603	Automotive Technology AAS	Olive Harvey College
470603	Advanced Auto Body Repair	Waubonsee Community College
470603	Auto Body Repair (AAS)	Waubonsee Community College
470603	Basic Auto Body Repair	Waubonsee Community College
470604	Training Observation Practice	Angel of God Resource
470604	Automotive Service Technology AAS Degree	College of DuPage
470604	Automotive Service Technology	College of DuPage
470604	Automotive Air Conditioning And Heating Specialist	College of Lake County
470604	Automotive Brakes Suspension Specialist Cert	College of Lake County
470604	Automotive Collision Repair Cert 24AE	College of Lake County
470604	Automotive Damage Analysis Cert 24AK	College of Lake County
470604	Automotive Electrical Specialist Cert 24UH	College of Lake County
470604	Automotive Fuel Systems Specialist Cert 24UI	College of Lake County
470604	Automotive Oil Change Specialist Cert 24UL	College of Lake County
470604	Automotive Service Refinishing Technician Cert	College of Lake County
470604	Automotive Technician Cert AUT 24AV	College of Lake County
470604	Automotive Transmission Specialist Cert 24UM	College of Lake County
470604	Automotive Under Hood Technician AAS 24AH	College of Lake County
470604	Automotive Electrical Specialist BVS	Elgin Comm. College District #509

470604	Automotive Service Technology AAS	Elgin Comm. College District #509
470604	Brake And Suspension Specialist	Elgin Comm. College District #509
470604	Engine Mechanical Repair Specialist BVS	Elgin Comm. College District #509
470604	Engine Performance Specialist BVS	Elgin Comm. College District #509
470604	Transmission Drivetrain Specialist BVS	Elgin Comm. College District #509
470604	Automotive Technology - Associate in Applied Sci	Harry S. Truman College
470604	Automotive Technology - Advanced (TRC)	Harry S. Truman College
470604	Automotive Technology - Basic (TRC)	Harry S. Truman College
470604	Automotive Driveline Specialist (COC)-TE020	Joliet Junior College
470604	Automotive Engine Performance Specialist	Joliet Junior College
470604	Automotive Service Technology (AAS)-TE030	Joliet Junior College
470604	Automotive Service Technology- (COA)-TE050	Joliet Junior College
470604	Brake and Chassis Specialist (COC)-TE090	Joliet Junior College
470604	Advanced Automotive Technology	Kishwaukee College
470604	Automotive Technology Degree	Kishwaukee College
470604	Basic Automotive Technology	Kishwaukee College
470604	Automotive Service Management-AAS Degree	Lincoln College of Technology
470604	Automotive Technology-Diploma Program	Lincoln College of Technology
470604	Advanced Automotive Tech	McHenry County College
470604	Automotive Maintenance Technician	McHenry County College
470604	Automotive Technology (AAS)	McHenry County College
470604	Automotive Technology, Management Option (AAS)	McHenry County College
470604	Automotive Service Technician	Moraine Valley Community College
470604	Automotive Technology AAS	Moraine Valley Community College
470604	Automotive Mobile Electronics	Morton College
470604	Automotive Service	Morton College
470604	Automotive Technology	Morton College
470604	Maintenance and Light Repair	Morton College
470604	Automotive Technology	Oakton Community College
470604	Automotive Services Technology	Prairie State College
470604	Professional Automotive Training	South Technical Center
470604	Automotive Brake and Suspension	Waubonsee Community College
470604	Automotive Electrical/Electronics	Waubonsee Community College
470604	Automotive Maintenance	Waubonsee Community College
470604	Automotive Recycling	Waubonsee Community College
470604	Automotive Transmission and Driveline	Waubonsee Community College
470604	Automotive Transportation Service Technology	Waubonsee Community College
470604	Engine Performance	Waubonsee Community College
470604	Light Duty Diesel Repair	Waubonsee Community College
470605	Diesel Power Technology Degree	Kishwaukee College
470605	Diesel Technology (Advanced)	Olive Harvey College
470605	Diesel Technology (Basic)	Olive Harvey College

470605	Diesel Technology AAS	Olive Harvey College
470605	Automotive / Diesel & Industrial Tech W/ FACT#344	Universal Technical Institute
470605	Automotive / Diesel & Industrial Technology #342	Universal Technical Institute
470605	Automotive Technology Program #115	Universal Technical Institute
470605	Automotive Technology with Ford FACT #124	Universal Technical Institute
470605	Automotive Technology with Toyota TPAT #807	Universal Technical Institute
470605	Diesel & Industrial Technology #208	Universal Technical Institute
470605	Diesel & Industrial Technology w/Daimler Trucks	Universal Technical Institute
470607	Aviation Mainenance Technology	Lewis University
470607	Aviation Maintenance Technology	Lewis University
470607	Aviation Technology (Sheet Metaling)	Olive Harvey College
470613	CDL Plus	Moraine Valley Community College
470613	160 Hour Class A CDL Truck Driving Training	Professional Truck Driving School, Inc.
470613	CDL Truck Driving 240	Star Truck Driving School, Inc
470614	Alternative Fuels (CNG)	Morton College
470617	Automotive Service Technology (Advanced) (COA)	Joliet Junior College
480501	Advanced Manufacturing Maintenance Mechanics	Chicago Center for Arts and Technology
480501	CNC Operations	College of DuPage
480501	Basic Machining Cert 24MJ	College of Lake County
480501	CNC Operations Cert 24NH	College of Lake County
480501	Machine Tool Trades 24SM	College of Lake County
480501	Machine Tool Operations VS	Elgin Comm. College District #509
480501	Computer Numerical Control (COC) - TE285	Joliet Junior College
480501	Machine Tool Metalworking (COC)	Joliet Junior College
480501	Mechanical Production Technology (COA)-TE610	Joliet Junior College
480501	Automated Engineering Tech - Degree	Kishwaukee College
480501	Engineering Technology/Fabrication	Triton College
480501	CNC (Computer Numerical Control) Training	Waubonsee Community College
480503	Machine Tool Trades AAS 24MD	College of Lake County
480503	Machine Tool Technology AAS	Elgin Comm. College District #509
480503	Machinist	Prairie State College
480503	NIMS Program	Prairie State College
480506	Sheet Metal Mechanics VS	Elgin Comm. College District #509
480507	Tool Mold Maker Phase III Cert 24SR	College of Lake County
480507	Fast Track for CNC Operators	Jane Addams Resource Corp
480507	Fast Track for CNC Operators	Jane Addams Resource Corp - Trng Site
480507	Precision Machining Apprentice	Kishwaukee College
480507	Tool and Die Apprenticeship Program	Technology and Manufacturing Association
480508	Welding	A Safe Haven Foundation
480508	American Welding Society	College of DuPage
480508	Welding	College of DuPage
480508	Gas Metal Arc Welding 24WN	College of Lake County

480508	Gas Tungsten Arc Welding Cert 24WM	College of Lake County
480508	Shielded Metal Arc Welding Cert 24WO	College of Lake County
480508	Combination Welding	Dawson Technical Institute
480508	Arc Welding BVS	Elgin Comm. College District #509
480508	MIG Welding BVS	Elgin Comm. College District #509
480508	Welding BVS	Elgin Comm. College District #509
480508	Welding VS	Elgin Comm. College District #509
480508	Skilled Welder	ETI School of Skilled Trades
480508	Welding Technology Program	First Institute
480508	Welding Technology Program	First Institute Training & Management
480508	Welding Technology Program	FITM - Mobile Welding Lab
480508	Welding Technology Program	FITM - Moblie Welding Lab
480508	Combination Structural/Pipe Welding Specialist	Illinois Welding School, Inc.
480508	Course No. 202 Basic Welding	Illinois Welding School, Inc.
480508	Pipe Welding Specialist	Illinois Welding School, Inc.
480508	Refresher Welding - Course No. 201	Illinois Welding School, Inc.
480508	Structural Welding Specialist	Illinois Welding School, Inc.
480508	Basic Welding (COC) - TE078	Joliet Junior College
480508	Welding Technology (AAS) - TE976	Joliet Junior College
480508	Advanced Welding Technology	Kishwaukee College
480508	Basic Welding Technology	Kishwaukee College
480508	Advanced Welding	McHenry County College
480508	Advanced Welding Technician	McHenry County College
480508	Welding Boot Camp	McHenry County College
480508	Welding Certification Qualification Preparation	McHenry County College
480508	Welding Technician	McHenry County College
480508	Welding Combination	Moraine Valley Community College
480508	Welding	Morton College
480508	Welder Technician	Prairie State College
480508	Welding Specialist	Prairie State College
480508	Basic Welding	Richard J Daley College
480508	Multi-Process Welding	South Suburban College
480508	Advanced Welding	Waubonsee Community College
480508	Welding	Waubonsee Community College
480508	Welding Technology AAS	Waubonsee Community College
480510	Manufacturing Computer Numerical Control (CNC)	Choice Career College
480510	Basic in CNC Machining	Wright College
480510	Manufacturing Pre-Apprenticeship Program	MCC Shah Center
480510	Manufacturing Pre-Apprenticeship Program	McHenry County College
480510	CNC Operations and Programming Preparation	Oakton Community College
480510	Manufacturing Technology AAS	Prairie State College
480510	Advanced in CNC Machining	Richard J Daley College

480510	Basic in CNC Machining	Richard J Daley College
480510	Advanced Quality Control Inspection for Manu	Symbol Training Institute
480510	QC 302: Applied Quality Control for Manufacturing	Symbol Training Institute
480510	21st Centrury CNC Level 1	Technology and Manufacturing Association
480510	21st Centrury CNC Level 2	Technology and Manufacturing Association
480510	Intermediate Swiss CNC	Technology and Manufacturing Association
480510	Advanced Manufacturing Technology	Waubonsee Community College
480510	Automation Technology AAS	Waubonsee Community College
480510	CNC Operator	Waubonsee Community College
480510	CNC Programmer	Waubonsee Community College
480510	CNC Machining Advanced	Wright College - North Campus
480510	CNC Machining Basic	Wright College - North Campus
480510	Swiss Star Screw Multi Axis Lathe Machine	Wright College - North Campus
480599	Automatic Screw Machine/CNC Machine Tool	Illinois Manufacturing Foundation
489999	OSHA 10-Hour Voluntary Compliance in General Ind	MCC Shah Center
490202	Fork Lift Operation and Safety 848	Olive Harvey College
490205	160 Driving Academy	160 Driving Academy
490205	160 Driving Academy 240 Hour Program	160 Driving Academy
490205	CDL Truck Driving 160	160 Driving Academy
490205	CDL Truck Driving 240	160 Driving Academy
490205	CDL Truck Driving 160	160 Driving Academy
490205	CDL Truck Driving 240	160 Driving Academy
490205	Truck Driver Training CDL Class A	Advantage Driver Training
490205	Class A CDL 240 Hours Program	Alamo Truck Driving School
490205	Class A CDL Truck Driving Course 160 Hours	All Pro Truck Driving School, LLC
490205	Class A CDL Truck Driving Course 240 Hours	All Pro Truck Driving School, LLC
490205	Upgrade to Class A CDL Driving Course 160 Hours	All Pro Truck Driving School, LLC
490205	Class A CDL (240 Hour) Truck Driver Training	America Business College, Inc
490205	Class A CDL (320 Hour) Truck Driver Training	America Business College, Inc
490205	160 Hour Basic Class A CDL Course	Blue Horizon Driving School Inc.
490205	200 Hour Intermediate Class A CDL Course	Blue Horizon Driving School Inc.
490205	240 hour Advanced Class A CDL Course	Blue Horizon Driving School Inc.
490205	Comm Driver License Program 160 Hours 6 CDL	College of DuPage
490205	Comm Driver License Program 240 Hours 6 CDL	College of DuPage
490205	Truck Driver Training PCDL 1	College of Lake County
490205	Class A CDL Truck Driving Training Course 240 Hours	Division Truck Driving School
490205	Accelerated CDL-A Course	Eagle Training Services
490205	CDL-A Semi-Tractor Trailer Driver Training Basic 160	Eagle Training Services
490205	CDL-A Semi-Tractor Trailer Driver Training Enhanced	Eagle Training Services
490205	HazMat Endorsement Study Course	Eagle Training Services
490205	CDL - A Semi-Tractor Trailer Driver Training	Eagle Training Services - Gateway Branch
490205	CDL-A Semi-Tractor Trailer Driver Training Basic 160	Eagle Training Services Inc. - Harper Branch

490205	Truck Driving BVS	Elgin Comm. College District #509
490205	Truck Driving Owner/Operator VS	Elgin Comm. College District #509
490205	Class A CDL Training Program (240 HRS)	Expert Driving School, Inc.
490205	Class A CDL Training Program (240 HRS)	Expert TRUCK Driving School
490205	Shipping & Receiving Training Program	Greater West Town
490205	Shipping & Receiving Training Program	Greater West Town Project - Youth
490205	Global Supply Chain Management (COA)-BU101	Joliet Junior College
490205	Global Supply Chain Management (COC)-BU201	Joliet Junior College
490205	Truck Driving (CDL)	Joliet Junior College
490205	Truck Driver Training with Hazardous Materials	Kishwaukee College
490205	Truck Driving Training	Kishwaukee College
490205	Truck Driving- Hazmat and Tankers Endorsement	Kishwaukee College
490205	Advanced 240 hour CDL Truck Driving Program	Kotra CDL Driving School
490205	CDL Training-160 Hours	McHenry County College
490205	CDL Training-240 Hours	McHenry County College
490205	Accelerated Professional Course	Mexico Juarez Driving School
490205	Juarez Driving School Advanced CDL Course	Mexico Juarez Driving School
490205	4 Week CDL Program	Mid-City Truck Driving Academy MidCity CDL
490205	5 Week CDL Program	Mid-City Truck Driving Academy MidCity CDL
490205	6 Week CDL Program	Mid-City Truck Driving Academy MidCity CDL
490205	8 Week CDL Program	Mid-City Truck Driving Academy MidCity CDL
490205	CDL Basic	Moraine Valley Community College
490205	CDL Basic with Forklift and Aerial Work Platform	Moraine Valley Community College
490205	Truck & Bus Driver/Comm Vehicle Operator & Inst	Oakton Community College
490205	Commercial Driver License (CDL) Training Class A	Olive Harvey College
490205	Commercial Driver License (CDL) Training Class B	Olive Harvey College
490205	Commercial Driver Training - Class A	Olive Harvey College
490205	Commercial Driver Training Class B	Olive Harvey College
490205	CDL Truck Driver Training-Class A-160HR	Prairie State College
490205	CDL Truck Driver Training-Class A-196HR with Endor	Prairie State College
490205	240 Hour Class A CDL Truck Driving Training	Professional Truck Driving School, Inc.
490205	90 Hour Up Grade Class A CDL Truck Driving Training	Professional Truck Driving School, Inc.
490205	Class A CDL Truck Driving Training Course 200	Progressive Truck Driving School, Inc.
490205	Class A CDL Truck Driving Training Course 240	Progressive Truck Driving School, Inc.
490205	Class A CDL Truck Driving Training Course 300	Progressive Truck Driving School, Inc.
490205	CDL Certification	Road Runner Driving School
490205	Class A CDL (200 hour program)	Road Runner Driving School
490205	Class A 160 hour Refresher Course	Star Truck Driving School, Inc
490205	240 Hour Class A Commercial Driver Training	Viking Driving School
490205	240 Hour Class A Commercial Driver Training	Viking Driving School Inc
490299	Forklift Operators Training	Kishwaukee College
490299	Forklift-Operator Training	MCC Shah Center

490299	Freight Broker/Agent Training	McHenry County College
499999	Certified Logistics Associate Program	Moraine Valley Community College
499999	Certified Logistics Technician Program	Moraine Valley Community College
499999	Supply Chain Management	Moraine Valley Community College
499999	Forklift Operation and Safety	Olive Harvey College
499999	Supply Chain Management & Logistics (SCML)	Olive Harvey College
499999	Supply Chain Management & Logistics (SCML)	Olive Harvey College
499999	Supply Chain Management & Logistics (SCML)	Olive Harvey College
499999	Logistics	South Suburban College
500401	Graphic Design Foundation	College of DuPage
500401	Web Design	College of DuPage
500401	Fundamentals of Design	McHenry County College
500401	Graphic Design (AAS)	Waubonsee Community College
500401	Graphic Design	Waubonsee Community College
500408	Interior Design (AAS)-FA200	Joliet Junior College
500409	Communication Design-Graphic Design Option	Elgin Comm. College District #509
500409	Graphic Arts AAS	McHenry County College
500409	Graphic Design	McHenry County College
500409	Graphic Design - Web & Interactive Design	Rasmussen College
500706	PMP Exam Review	DePaul University
510000	Caregiver/Home Health Aide	Moraine Valley Community College
510000	Medical Office Assistant	New Horizons
510000	Medical Assistant	Northwest Suburban College
510000	Dialysis Patient Care Technician	Prestige Nurse Aide Training Academy
510000	Medical Billing and Coding	Rasmussen College
510000	Alcohol/Drug Counselor Post Baccalaureate	Waubonsee Community College
510202	Hearing Instrument Dispensary	College of DuPage
510601	Clinical Dental Assistant	B.& D.A. Inc.
510601	Chairside Dental Assistant Program	Chicago Career College
510601	Dental Assistant	Chicago State University
510601	Dental Assistant	College of DuPage
510601	Clinical Dental Assisting VS	Elgin Comm. College District #509
510601	Dental Office Aide BVS	Elgin Comm. College District #509
510601	Dental Assisting	First Institute
510601	Dental Assisting	First Institute Training & Management
510601	Dental Assistant	Joliet Junior College
510601	Dental Assistant (MGT 818)	Joliet Junior College
510601	Dental Assisting Program	Moraine Valley Community College
510601	Dental Assistant	National College of Health
510601	Dental Assistant	National College of Health, Inc
510601	Dental Assisting/Assistant	Northeastern Illinois University
510601	Dental Assistant	Northwest Suburban College

510601	Chairside Assisting	State Career College
510601	Dental Assisting	Triton College
510602	Dental Hygiene AAS 21DH	LakeShore Campus
510602	Dental Hygiene	Malcolm X College
510602	Dental Hygiene AAS	Prairie State College
510701	Bachelor of Health Administration (BHA)	Governors State University
510701	Healthcare Leadership (Bachelor of Arts)	Lewis University
510701	BS Health Care Management	University of St. Francis
510701	Health Administration (Master of Science)	University of St. Francis
510703	Certified Health Unit Coordinator	McHenry County College
510703	Health Unit Coordinator	Prairie State College
510705	Certified Medical Assistant with CNA	Chicago Community Learning Center - CCLC
510705	Healthcare Management BS	Rasmussen College
510706	Certified Medical Adm Asst Medical Billing/Coding	Governors State University
510706	Health Information Management (AAS)-CO525	Joliet Junior College
510706	Accounting Technician	Taylor Business Institute
510706	Medical Billing & Coding Specialist	Taylor Business Institute
510706	Health Information Technology AAS	Waubonsee Community College
510707	Health Information Technology	Chicago Center for Arts and Technology
510707	Electronic Medical Records Specialist	Chicago Community Learning Center
510707	Electronic Medical Records Specialist	Chicago Community Learning Center - CCLC
510707	Health Information Technology AAS Degree	College of DuPage
510707	Health Information Technology AAS 21HM	College of Lake County
510707	Medical Billing Health & IT Technician-Part Time	Computer Training Institute of Chicago
510707	Medical Billing and Coding Specialist (51.0713)	Coyne American Institute
510707	Medical Billing and Coding Specialist (51.0713)	Coyne College
510707	Medical Administrative Assistant Certification	Elgin Comm. College District #509
510707	Medical Administrative Assistant with EHR	Joliet Junior College
510707	Health Information Technology Management-AAS	Malcolm X College
510707	Medical Billing	Malcolm X College
510707	Medical Coding	Malcolm X College
510707	Health Information Technology (AAS)	McHenry County College
510707	Health Information Technology A.A.S.	Moraine Valley Community College
510707	Electronic Records Management	Morton College
510707	Electronic Health Records Specialist/MAA with EHR	Oakton Community College
510707	Medical Coding and Billing	Oakton Community College
510707	Health Information Technician-AAS	Rasmussen College
510707	Medical Billing and Coding Cert.	Waubonsee Community College
510708	Physician's Office Coding and Billing	College of DuPage
510708	Medical Transcription (COA)-CO820	Joliet Junior College
510708	Medical Transcription Editor	Joliet Junior College
510710	Healthcare Office Assistant Cert 21ME	College of Lake County

510710	Medical Office Assistant VS	Elgin Comm. College District #509
510710	Medical Office Support	Morton College
510710	Medical Office Specialist	National Latino Education Inst
510710	Medical Administrative Assistant	Prairie State College
510710	Medical Assisting Diploma	Rasmussen College
510713	Medical Billing Specialist Cert 21HN	College of Lake County
510713	Medical Coding & Billing	JCM III Corporation
510713	Inpatient Auditing	Joliet Junior College
510713	Medical Coding Specialist (COA)-CO520	Joliet Junior College
510713	Professional Medical Coding and Billing Online	Joliet Junior College
510713	Medical Billing And Coding	Kishwaukee College
510713	Medical Billing Specialist Cert 21HN	LakeShore Campus
510713	MEDICAL INFORMATION SYSTEMS & MANAGEMENT	Management and IT Solutions
510713	Medical Office Coding and Billing Specialist	Management and IT Solutions
510713	MEDICAL INFORMATION SYSTEMS & MANAGEMENT	Management and IT Solutions
510713	Medical Office Coding and Billing Specialist	Management and IT Solutions
510713	MEDICAL INFORMATION SYSTEMS & MANAGEMENT	Management and IT Solutions
510713	Medical Office Coding and Billing Specialist	Management and IT Solutions
510713	CBCS Medical Billing & Coding	McHenry County College
510713	CPC Medical Billing & Coding	McHenry County College
510713	Medical Billing and Coding	McHenry County College
510713	Coding Specialist Program	Moraine Valley Community College
510713	Medical Billing and Coding Specialist	National College of Health
510713	Medical Billing and Coding Specialist	National College of Health, Inc
510713	Medical Insurance Specialist/Medical Biller & HIT	Northeastern Illinois University
510713	Medical Coding & Billing	Oakton Community College
510713	Professional Medical Coding and Billing	Oakton Community College
510713	Medical Coding and Billing	Prairie State College
510713	Coding Specialist	South Suburban College
510713	Health IT: Medical Billing and Coding	Triton College
510713	Medical Billing and Coding	Waubonsee Community College
510714	Medical Billing and Coding	B.& D.A. Inc.
510714	Medical Billing and Coding	Chicago State University
510714	Medical Billing and Coding	Genesis Healthcare Institute
510714	Medical Coding (MGT 910) (Noncredit)	Joliet Junior College
510714	CBCS Cert Medical Admin Asst w/Medical Billing/Coding	McHenry County College
510714	CPC Cert Medical Adm Asst & Medical Billing/Coding	McHenry County College
510714	Medical Billing	Moraine Valley Community College
510716	Certified Medical Administrative Assistant (CMAA	McHenry County College
510716	Medical Administration	McHenry County College
510716	Medical Administrative Assistant -	Rasmussen College

510716	Medical Administrative Assistant	Triton College
510717	Dialysis Technician	Moraine Valley Community College
510799	EKG Technician Certification	Elgin Comm. College District #509
510799	Medical Billing and Coding Certification	Elgin Comm. College District #509
510799	Pharmacy Technicians Certification	Elgin Comm. College District #509
510799	Master of Health Administration (MHA)	Governors State University
510801	Medical Assistant Program	A Plus Healthcare Training
510801	Medical Assistant and Dental Assistant	B.& D.A. Inc.
510801	Medical Assistant	College of DuPage
510801	Medical Assisting Cert 21MA	College of Lake County
510801	Medical Assistant (51.0801)	Coyne American Institute
510801	Medical Assistant (51.0801)	Coyne College
510801	Medical Assisting	First Institute
510801	Medical Assisting	First Institute Training & Management
510801	Medical Assisting Program	Genesis Healthcare Institute
510801	Medical Assistant Program	Healthcare Training Institute
510801	Medical Assistant Program with CNA	Healthcare Training Institute
510801	Medical Assistant	International Training Academy
510801	Medical Assisting Cert 21MA	LakeShore Campus
510801	Medical Assistant-Diploma	Lincoln College of Technology
510801	Medical Assisting	Malcolm X College
510801	Certified Administrative Medical Assistant	Management and IT Solutions
510801	Certified Clinical Medical Assistant	Management and IT Solutions
510801	Medical Assistant Comprehensive	Management and IT Solutions
510801	Certified Administrative Medical Assistant	Management and IT Solutions
510801	Certified Clinical Medical Assistant	Management and IT Solutions
510801	Medical Assistant Comprehensive	Management and IT Solutions
510801	Certified Administrative Medical Assistant	Management and IT Solutions
510801	Certified Clinical Medical Assistant	Management and IT Solutions
510801	Medical Assistant Comprehensive	Management and IT Solutions
510801	Clinical Medical Assistant Capstone (non-credit)	McHenry County College
510801	Medical Assistant	Moraine Valley Community College
510801	Medical Assistant	National College of Health
510801	Medical Assistant	National College of Health, Inc
510801	Bilingual Medical Assistant	National Latino Education Inst
510801	Medical Assistant Diploma Training Program	New Lake College
510801	Clinical Medical Assistant	Northeastern Illinois University
510801	Clinical Medical Assistant	Prairie State College
510801	Health Sciences - Associate's Degree	Rasmussen College
510801	Medical Assistant	South Suburban College
510801	Clinical Medical Assistant	Tukiendorf Training Institute
510801	Medical Assistant	Tukiendorf Training Institute

510801	Medical Assistant & Patient Care Technician	Tukiendorf Training Institute
510801	Clinical Medical Assistant	Tukiendorf Training Institute (TTI)
510801	Medical Assistant	Tukiendorf Training Institute (TTI)
510801	Medical Assistant & Patient Care Technician	Tukiendorf Training Institute (TTI)
510801	Medical Asssitant	University of The Potomac-Chicago
510801	Medical Assistant	Waubonsee Community College
510802	Phlebotomy/Dialysis Technician	Elim Outreach Training Center
510802	Phlebotomy/Dialysis/Electrocardiogram Techncian	Elim Outreach Training Center
510802	Medical Assistant	Mildun Training Center of Illinois
510803	Occupational Therapy Assistant (AAS)	McHenry County College
510803	Occupational Therapy Assistant	South Suburban College
510803	AAS Occupational Therapy Assistant (OTA)	Wright College - North Campus
510805	Retail Pharmacy Technician	Chicago State University
510805	Pharmacy Technician - VALH 95	College of Lake County
510805	Pharmacy Technician (51.0805)	Coyne American Institute
510805	Pharmacy Technician (51.0805)	Coyne College
510805	CNA/Pharmacy Technician	Elim Outreach Training Center
510805	Pharmacy Technician	Elim Outreach Training Center
510805	Pharmacy Technician	Governors State University
510805	Pharmacy Technician Program-Online	Governors State University
510805	Pharmacy Technician- ASHP/ACPE accredited	Joliet Junior College
510805	Pharmacy Technician- non ASHP/ACPE	Joliet Junior College
510805	Pharmacy Technician	Kishwaukee College
510805	Pharmacy Technology (MXC)	Malcolm X College
510805	Pharmacy Technician Certification Program	MCC Shah Center
510805	Pharmacy Technician Voucher Included	McHenry County College
510805	Pharmacy Technician	Moraine Valley Community College
510805	Professional Pharmacy Technician Training Program	Morton College
510805	Pharmacy Technician	National College of Health
510805	Pharmacy Technician	National College of Health, Inc
510805	Pharmacy Technician Program	Northeastern Illinois University
510805	Pharmacy Technician 600 Hours	Northwest Suburban College
510805	Pharmacy Technician	Oakton Community College
510805	Pharmacy Technician	Prairie State College
510805	Pharmacy Technician	Rasmussen College
510805	Pharmacy Technician Program	Skokie Institute of Allied Health & Tech
510805	Pharmacy Technician	South Suburban College
510806	Physical Therapist Assistant AAS Degree	Elgin Comm. College District #509
510806	CNA/Physical Therapy Aide	Elim Outreach Training Center
510806	Physical Therapy Assistant	Malcolm X College
510806	Associate Physical Therapist Assistant	Morton College
510806	Physical Therapy Assistant, A.A.S. degree	Oakton Community College

510808	Veterinary Assistant	College of DuPage
510808	Veterinary Assistant Training PVET 1	College of Lake County
510808	Veterinary Medical Technology (AAS)-AG500	Joliet Junior College
510808	Veterinary Assistant	McHenry County College
510809	Anesthesia Technology AAS Degree	College of DuPage
510899	CNA & Phlebotomy Tech/Medical Terminology/CPR	Chicago Community Learning Center
510899	CNA--Certified Nursing Assistant	Chicago Community Learning Center
510899	CNA & Phlebotomy Tech/Medical Terminology/CPR	Chicago Community Learning Center - CCLC
510899	CNA--Certified Nursing Assistant	Chicago Community Learning Center - CCLC
510899	Medical Assisting AAS 21MD	College of Lake County
510899	CNA/ Dialysis	Elim Outreach Training Center
510899	CNA/Electrocardiogram	Elim Outreach Training Center
510899	CNA/Phlebotomy	Elim Outreach Training Center
510899	Medical Assisting	Elim Outreach Training Center
510899	Phlebotomy/Electrocardiogram	Elim Outreach Training Center
510899	Diploma in Medical Assisting	Midwestern Career College
510899	Medical Assistant	State Career College
510901	Ultrasound / Sonography Technician	Aquarius Institute Of Computer Sciences
510901	Cardiac Interventional Radiography Specialist	College of DuPage
510901	Electrocardiogram (EKG) Technician	Elim Outreach Training Center
510901	EKG Technician Training Program	New Lake College
510902	Electrocardiography Technician Training Program	A Plus Healthcare Training
510902	EKG Technician Program	Avid CNA School
510902	EKG Technician	Chicago State University
510902	Non-Invasive Electrocardiography Technician	College of DuPage
510902	Basic Electrocardiogram	Excelsior Healthcare Academy
510902	Electrocardiography Technician (EKG) (COC)-NU073	Joliet Junior College
510902	EKG Technician	National College of Health
510902	EKG Technician	National College of Health, Inc
510902	EKG Technician	Triton College
510902	EKG Technician	Tukiendorf Training Institute
510902	EKG Technician	Tukiendorf Training Institute (TTI)
510902	ECG/EKG Technician	Western Polytechnic Institute LLC
510903	Electroneurodiagnostic (END) Technologist Training	Midwestern Career College
510904	Emergency Medical Technician (EMT)	College of DuPage
510904	Emergency Medical Technology-Paramedic BVS	Elgin Comm. College District #509
510904	EMT-B Emergency Medical Technician - Basic	Elgin Comm. College District #509
510904	Emergency Medical Services (Paramedic) (AAS)	Joliet Junior College
510904	EMT II/Paramedic	Malcolm X College
510904	EMT-B	Malcolm X College
510904	Emergency Medical Technician	Prairie State College
510904	Emergency Medical Technician Basic	South Suburban College

510904	Emergency Medical Technician	Triton College
510904	Emergency Medical Technician - Basic	Waubonsee Community College
510904	Emergency Medical Technician - Paramedic AAS	Waubonsee Community College
510904	Emergency Medical Technician-Basic	Wilco Area Career Center
510907	MRI Technolgist	Aquarius Institute Of Computer Sciences
510907	Diagnostic Medical Imaging Radiography Technician	College of DuPage
510907	Mammography	College of DuPage
510907	Computed Tomography Cert 21MT	College of Lake County
510907	Medical Imaging AAS 21MI	College of Lake County
510907	Medical Radiologic Technology	Malcolm X College
510907	Radiologic Technology AAS	Moraine Valley Community College
510907	Radiographic/X-Ray Technician	National College of Health
510907	Radiographic/X-Ray Technician	National College of Health, Inc
510907	Radiation Therapy (Bachelor of Science)	University of St. Francis
510908	Respiratory Care AAS Degree	College of DuPage
510908	Respiratory Care	Malcolm X College
510908	Respiratory Therapy Technology AAS	Moraine Valley Community College
510909	Surgical Assistant	College of DuPage
510909	Surgical Technology - AAS Degree	College of DuPage
510909	Surgical Technology -	College of DuPage
510909	Surgical Technology Cert 21SD	College of Lake County
510909	Surgical Technology VS	Elgin Comm. College District #509
510909	Sterile Processing Clinical	Malcolm X College
510909	Surgical Technology	Malcolm X College
510909	Associate in Applied Science in Surgical Technology	Midwestern Career College
510909	Surgical Technologist - Associate's Degree	Rasmussen College
510909	Surgical Technology	Rush-Copley Medical Center
510909	Surgical Technology	Triton College
510909	Surgical Technology	Waubonsee Community College
510910	Diagnostic Medical Imaging Sonography	College of DuPage
510910	Diagnostic Medical Vascular Sonography	College of DuPage
510910	Magnetic Resonance Imaging Cert 21MR	College of Lake County
510910	Diagnostic Medical Sonography (AAS) - NU095	Joliet Junior College
510910	Associates in Applied Science in DMS	Midwestern Career College
510910	Magnetic Resonance Imaging (MRI) Technologist	National College of Health
510910	Noninvasive Cardiovascular Ultrasound/Sonography	National College of Health
510910	Magnetic Resonance Imaging (MRI) Technologist	National College of Health, Inc
510910	Noninvasive Cardiovascular Ultrasound/Sonography	National College of Health, Inc
510910	Echocardiography	South Suburban College
510910	Magnetic Resonance Imaging (MRI)	South Suburban College
510911	Radiography AAS	Elgin Comm. College District #509
510911	Radiologic Technology	Kishwaukee College

510915	EKG Technician Program-Prestige	Prestige Nurse Aide Training Academy
510917	Polysomnography	College of DuPage
510920	Associates of Applied Science in MRI	Midwestern Career College
511004	Clinical Laboratory Assistant BVS	Elgin Comm. College District #509
511004	Clinical Laboratory Technology AAS	Elgin Comm. College District #509
511004	Clinical Laboratory Assistant/Phlebotomist	Elim Outreach Training Center
511004	Phlebotomy Technician (ASCP)	McHenry County College
511004	Nanotechnology	Oakton Community College
511004	Neurology Technician Program	Skokie Institute of Allied Health & Tech
511005	Medical Technology (Bachelor of Science)	University of St. Francis
511007	Histotechnology VS	Elgin Comm. College District #509
511009	Phlebotomy Technician	Avid CNA School
511009	Phlebotomy Technician	Chicago Instruction Center for C.D.
511009	Phlebotomy Technician	Chicago State University
511009	Phlebotomy Technician Training Program	City College of Education
511009	Phlebotomy Cert 21MP	College of Lake County
511009	Phlebotomy Technician	Elim Outreach Training Center
511009	Phlebotomy Technician	Excelsior Healthcare Academy
511009	Phlebotomy Certification	First Step to Excellence Health Care
511009	Phlebotomy Technician Program	Governors State University
511009	Phlebotomy Technician Program-Online	Governors State University
511009	Phlebotomy Technician Training Program	Hugs Inc.
511009	Phlebotomy	International Career Institute
511009	Phlebotomy Program (MXC)	Malcolm X College
511009	Phlebotomy	Moraine Valley Community College
511009	Phlebotomy Technician	National College of Health
511009	Phlebotomy Technician	National College of Health, Inc
511009	Phlebotomy Technician	National Latino Education Inst.
511009	Phlebotomy Technician Training Program	New Lake College
511009	Phlebotomy Technician Training Program	Nirvana Institute
511009	Phlebotomy	Oakton Community College
511009	Phlebotomy	South Suburban College
511009	Phlebotomy	Stars Academy-School of Phlebotomy
511009	Dialysis Technician	Triton College
511009	Phlebotomy Technician	Triton College
511009	Phlebotomy Technician	Tukiendorf Training Institute
511009	Phlebotomy Technician & EKG Technician	Tukiendorf Training Institute
511009	Phlebotomy Technician	Tukiendorf Training Institute (TTI)
511009	Phlebotomy Technician & EKG Technician	Tukiendorf Training Institute (TTI)
511009	Phlebotomy Technicia	Western Polytechnic Institute LLC
511011	Dialysis Technician	Elim Outreach Training Center
511011	Dialysis Technologist Training Program	Midwestern Career College

511011	Dialysis Technologist Training Program	Naperville
511011	Dialysis Technologist	National College of Health
511011	Dialysis Technologist	National College of Health, Inc
511011	Hemodialysis Care Technician	Tukiendorf Training Institute
511011	Hemodialysis Technician	Tukiendorf Training Institute
511011	Hemodialysis Tech with Phlebotomy & EKG Tech	Tukiendorf Training Institute
511011	Hemodialysis Care Technician	Tukiendorf Training Institute (TTI)
511011	Hemodialysis Technician	Tukiendorf Training Institute (TTI)
511011	Hemodialysis Tech with Phlebotomy & EKG Tech	Tukiendorf Training Institute (TTI)
511011	Hemodialysis Technician with Phlebotomy Tech	Tukiendorf Training Institute (TTI)
511012	Sterile Processing Technician	Triton College
511099	Patient Care Technician CNA, Phlebotomy and EKG	Elim Outreach Training Center
511099	Patient Care Technician CNA, Phlebotomy & Dialysis	Elim Outreach Training Center
511099	Combined Phlebotomy and EKG Technician	National College of Health
511099	Combined Phlebotomy and EKG Technician	National College of Health, Inc
511102	Central Processing Distribution Technician	College of DuPage
511199	Health Sciences General, B.S.	Northern Illinois University
511501	Accelerated Addictions Counseling and Treatment	College of Lake County
511501	Addiction Counseling & Treatment Cert 25HG	College of Lake County
511501	Addiction Counseling & Trmt AAS 25HD	College of Lake County
511501	Human Services Substance Abuse Counseling AAS	Elgin Comm. College District #509
511501	Human Services Substance Abuse Counseling VS	Elgin Comm. College District #509
511501	Addictions Counseling	Waubonsee Community College
511502	Human Services Generalist AAS	Elgin Comm. College District #509
511502	Human Services Generalist VS	Elgin Comm. College District #509
511802	Eye Care Assistant	College of DuPage
511802	Optical Assistant Training	Triton College
512099	Pharmacy Technician (Noncredit)	Joliet Junior College
512201	Public Health, B.S.	Northern Illinois University
512201	Public Health, Masters	Northern Illinois University
512207	Public Health, Graduate	Northern Illinois University
512208	Bachelor of Health Science (BHS)	Governors State University
512299	Maasters of Public Health (on-line program)	Benedictine University
512306	Master of Occupational Therapy (MOT)	Governors State University
512307	Prosthetics Technology (COA)-TE122	Joliet Junior College
512308	Physical Therapy Aide	Triton College
512399	Rehabilitation Aide Program	Triton College
512601	Basic Nursing Assistant Training Program (CNA)	Genesis Healthcare Institute
512601	Certified Nursing Assistant	Wilco Area Career Center
512602	Phlebotomy/EKG	College of DuPage
512602	Personal Care Aide - VALH 12	College of Lake County
512604	Physical Therapist Aide	Joliet Junior College

512604	Physical Therapy Office Professional	Joliet Junior College
512699	Electrocardiograph Technician Program	Healthcare Training Institute
512699	Patient Care Technician	Healthcare Training Institute
512699	Anatomy & Physiology and LPN	Verve College
513801	Associates of Applied Science in Nursing (AAS)	Ambria College of Nursing
513801	Bachelor of Science in Nursing	Ambria College of Nursing
513801	Bachelor of Science in Nursing	Chamberlain University
513801	Associate Degree Nursing (ADN)	College of DuPage
513801	Nursing AAS 21NC	College of Lake County
513801	Nursing AAS	Elgin Comm. College District #509
513801	Bachelor of Science in Nursing	Governors State University
513801	Nursing (RN) (AAS)-NU500	Joliet Junior College
513801	Registered Nursing Degree	Kishwaukee College
513801	RN-BSN Degree Completion Program	Lewis University
513801	Nursing Associate in Applied Science (0239) MXC	Malcolm X College
513801	Nursing (AAS)	McHenry County College
513801	Nursing-Associate in Applied Science	Morton College
513801	Nursing. B.S.	Northern Illinois University
513801	Nursing AAS Degree	Oakton Community College
513801	Nursing AAS	Prairie State College
513801	Professional Nursing AAS Degree	Rasmussen College
513801	Nursing (AAS)	Rush-Copley Medical Center
513801	Nursing - Associate Degree (RN)	South Suburban College
513801	Nursing (Master of Science)	University of St. Francis
513801	Nursing - Traditional (Bachelor of Science)	University of St. Francis
513801	RN BSN Completion Bridge Program w/ JJC	University of St. Francis
513801	RN-BSN Completion Program (online)	University of St. Francis
513801	Teaching in Nursing	University of St. Francis
513801	Nursing (AAS)	Waubonsee Community College
513802	Nursing, M.S.	Northern Illinois University
513803	RN 16-week Refresher Course	College of DuPage
513803	Basic Nurse Assistant Training Program	New Lake College
513803	Patient Care Technician Program-Prestige	Prestige Nurse Aide Training Academy
513815	Community Health Worker	South Suburban College
513901	Practical Nursing Program	Ambria College of Nursing
513901	Practical Nursing	Americare Technical School
513901	Licensed Practical Nurse	Aquarius Institute Of Computer Sciences
513901	Practical Nursing Program (LPN)	ATS Institute of Technology
513901	Practical Nursing	CAAN Academy of Nursing
513901	Basic Nurse Assistant Training	First Step to Excellence Health Care
513901	Licensed Practical Nurse Training	First Step to Excellence Health Care
513901	LPN Program	Great Paragon Health Services Inc.

513901	Practical Nursing (PN) (COA)-NU060	Joliet Junior College
513901	Practical Nursing (240)	Malcolm X College
513901	Nursing AAS	Moraine Valley Community College
513901	Certified Nursing Assistant	Nirvana Institute
513901	Practical Nursing Program (51:1613)	North Shore College
513901	LPN w/ 1 NCLEX Exam	Verve College
513902	Patient Care Technician	A Plus Healthcare Training
513902	Certified Nursing Assistant	AACF/KAM Institute of Technology & Health
513902	Basic Nursing Assistant Training Program	Avid CNA School
513902	Basic Nursing Assistant Training Program	Best Step Academy
513902	Patient Care Tech with Computer Fundamentals	Chicago Community Learning Center
513902	CNA & Phlebotomy Technician & CPR	Chicago Community Learning Center - CCLC
513902	Patient Care Tech with Computer Fundamentals	Chicago Community Learning Center - CCLC
513902	Basic Nursing Assistant	Chicago State University
513902	Home Health Aide/Personal Care Assistant	Chicago State University
513902	Basic Nurse Assistant Training Program	City College of Education
513902	Basic Nursing Assistant	College of DuPage
513902	Operating Room Patient Care Technician	College of DuPage
513902	Certified Nurse Assisting Cert 21NB	College of Lake County
513902	Basic Nursing Assistant	Delrose Training Program
513902	Basic Nursing Training Program	Divine Basic Nursing Assistant Training
513902	Basic Nurse Assistant Training Program	Elgin Comm. College District #509
513902	Basic Nurse Assistant with Phlebotomy	Elgin Comm. College District #509
513902	Basic Nurse Assistant	Elim Outreach Training Center
513902	CNA/Mental Health Worker/Psychatric Aide	Elim Outreach Training Center
513902	BASIC NURSING ASSISTANT	Excelsior Healthcare Academy
513902	Patient Care Technician	Excelsior Healthcare Academy
513902	Patient Care Technician 11	Excelsior Healthcare Academy
513902	Basic Nursing Assistant Training Program	Healthcare Training Institute
513902	Certified Nursing Assistant	Hugs Inc.
513902	Healthcare Bilingual Bridge Program	Instituto Del Progreso Latino
513902	Basic Nursing Assistant Training Program	International Career Institute
513902	Patient Care Tech Program with Phlebotomy	International Career Institute
513902	Basic Nurse Assistant	JCM III Corporation
513902	Patient Care Technician (PCT)	JCM III Corporation
513902	Advanced Certified Nurse Assistant (CNA)	Joliet Junior College
513902	Nurse Assistant (CNA) (COC)-NU400	Joliet Junior College
513902	Basic Nurse Assisting	Kishwaukee College
513902	Certified Nursing Assistant Recertification	Kishwaukee College
513902	Certified Nursing Assistant	Lights of Zion Ministries
513902	Basic Nurse Assistant Training Program	Magnificent Healthcare & CPR Inc
513902	Certified Nursing Assistant Basic (MXC)	Malcolm X College

513902	Patient Care Tech (Health Professions)	Malcolm X College
513902	Basic Nurse Assistant (BNA)	McHenry County College
513902	Patient Care Tech.	McHenry County College
513902	Basic Nurse Assistant	Moraine Valley Community College
513902	Advanced Bedside Care Technician	Morton College
513902	Nurse Assistant	Morton College
513902	Nursing Assistant	National College of Health
513902	Nursing Assistant (CNA)	National College of Health
513902	Patient Care Technician (PCT)	National College of Health
513902	Nursing Assistant (CNA)	National College of Health, Inc
513902	Patient Care Technician (PCT)	National College of Health, Inc
513902	Basic Nurse Assistant Training	Oakton Community College
513902	CNA/Certified Nursing Assistant	Prairie State College
513902	Basic Nursing Assistant Training Program (CNA)	Prestige Nurse Aide Training Academy
513902	Nurse Assistant Training	Prudential Home Health Services Corp
513902	Nurse Assistant Program	Scott School of Careers
513902	Nursing Assistant / Aide	South Suburban College
513902	Basic Nursing Assistant Training Program	State Career College
513902	C417E Nurse Assistant	Triton College
513902	Basic Nursing Assistant (CNA)	Tukiendorf Training Institute
513902	Patient Care Technician	Tukiendorf Training Institute
513902	Basic Nursing Assistant (CNA)	Tukiendorf Training Institute (TTI)
513902	Patient Care Technician	Tukiendorf Training Institute (TTI)
513902	Basic Nurse Assistant Training Program	Waubonsee Community College
513902	Operating Room Patient Care Tech. of Achievement	Waubonsee Community College
513902	Certified Nursing Assistant (CNA)	Western Polytechnic Institute LLC
513902	Certified Nursing Assistant Basic (MXC)	West-Side Learning Center
513999	Basic Nurse Aide Training Program (CNA)	A Plus Healthcare Training
513999	Practical Nursing	Adonis College of Nursing
513999	Practical Nursing Diploma Training Program	New Lake College
513999	Practical Nursing Program	State Career College
519999	Certification Program for Patient Care Technician	Genesis Healthcare Institute
519999	EKG Technician	Genesis Healthcare Institute
519999	EKG Basic and Advance	JCM III Corporation
519999	Phlebotomy Technician (511009)	JCM III Corporation
519999	Orthotics Technology (COA)-TE121	Joliet Junior College
519999	Certified Clinical Medical Assistant Academy	McHenry County College
519999	Medical Assisting with Radiographic / X-Ray Tech	National College of Health
519999	Medical Assisting with Radiographic / X-Ray Tech	National College of Health, Inc
519999	Medical Central Service Technician	Prairie State College
519999	Phlebotomy Tech Program	Prestige Nurse Aide Training Academy
519999	Phlebotomy-EKG Combo Program	Prestige Nurse Aide Training Academy

519999	Nuclear Medicine Technology (Bachelor of Science)	University of St. Francis
520201	Management AAS Degree	College of DuPage
520201	Management	College of DuPage
520201	Business Administration (MS Office & Quickbooks)	Computer Training Institute of Chicago
520201	Sales Force Administrator-Part Time	Computer Training Institute of Chicago
520201	Online Project Management	DePaul University
520201	Business Analysis, Agile, Six Sigma and ITIL	Directions Training Center, Inc
520201	PMI Agile (PMI-ACP)	Directions Training Center, Inc
520201	PMP or CAPM and Microsoft SQL 2016	Directions Training Center, Inc
520201	PMP, Agile, Business Analyst and Lean Six Sigma	Directions Training Center, Inc
520201	PMP, Agile, ITIL and Lean Six Sigma Green Belt	Directions Training Center, Inc
520201	Management Expert	eConsulting Group, Inc.
520201	Office Manager	eConsulting Group, Inc.
520201	Business Administration (BSAD) (BA)	Governors State University
520201	Business Administration (AAS)-BU505	Joliet Junior College
520201	Management and Supervision (AAS)-BU510	Joliet Junior College
520201	Management and Supervision (COA)-BU375	Joliet Junior College
520201	CDL Refresher	Kishwaukee College
520201	Marketing and Management	Kishwaukee College
520201	Business Administration (Bachelor of Science)	Lewis University
520201	Management (Bachelor of Arts)	Lewis University
520201	Business Management (AAS)	McHenry County College
520201	Business Management Principles	McHenry County College
520201	Entrepreneurship	McHenry County College
520201	Organizational Leadership	McHenry County College
520201	Business Administration Professional	New Horizons
520201	Business Office Associate	New Horizons
520201	Business Administration, Bachelor of Science (BSBA)	Northern Illinois University
520201	Business Administration, Masters (M.B.A.)	Northern Illinois University
520201	Management, B.S.	Northern Illinois University
520201	Project Management Professional (PMP)	Premier Technology Consultants, Inc.
520201	Business Management - BS	Rasmussen College
520201	Business Management AAS	Rasmussen College
520201	Business Management	Triton College
520201	BBA -Major in any one of 8 programs	University of St. Francis
520201	BSBA-5 Concentrations Available	University of St. Francis
520201	Business Administration (Master's Degree)	University of St. Francis
520201	Business Administration (AAS)	Waubonsee Community College
520201	Management	Waubonsee Community College
520201	Management Marketing AAS	Wright College - North Campus
520201	Management Marketing Advanced	Wright College - North Campus
520201	Management Marketing Basic	Wright College - North Campus

520202	Purchasing & Supply Chain Management	McHenry County College
520203	Logistics and Supply Chain Management Program	DePaul University
520203	Purchasing and Supply Management	DePaul University
520203	Six Sigma Black Belt Program	DePaul University
520203	Six-Sigma Green Belt Program	DePaul University
520203	Lean Six Sigma Green Belt Course	Governors State University
520203	Purchase/Supply Chain Mgmt, freight Broker Agent	Governors State University
520203	Supply Chain Management +2	Illinois Institute of Technology
520203	Supply Chain Management - Career	Illinois Institute of Technology
520203	Supply Chain Management Professional	Illinois Institute of Technology
520203	Certified Logistics Associate/Forklift/Aerial Work	Moraine Valley Community College
520203	Certified Logistics Tech & Forklift/Aerial Work	Moraine Valley Community College
520203	Forklift Operator and Aerial Work Platform Operator	Moraine Valley Community College
520203	Supply Chain Mgmt w/ Forklift and Aerial Work Plat	Moraine Valley Community College
520203	Supply Chain Management & Logistics AAS	Olive Harvey College
520203	Supply Chain Management & Logistics Advanced	Olive Harvey College
520203	Supply Chain Management & Logistics Basic	Olive Harvey College
520203	Supply Chain and Logistics Management - Bachelor's degree	Rasmussen College
520203	Bachelor of Business Admin with Minor in Logistics	University of St. Francis
520203	BBA - Major in Transportation & Logistics Management	University of St. Francis
520203	Concentration in Transportation & Logistics Mgmt	University of St. Francis
520203	Graduate	University of St. Francis
520204	Supervision Cert BUS 22BK	College of Lake County
520204	Supervisory & Administrative Management VS	Elgin Comm. College District #509
520204	Supervisory and Administrative Management BVS	Elgin Comm. College District #509
520204	Management/Marketing-Basic	Harry S. Truman College
520204	Office Administration	IT Expert System, Inc
520204	Supervision Cert BUS 22BK	LakeShore Campus
520204	Office Management	MicroTrain Technologies
520204	Office Technologies Fundamentals	MicroTrain Technologies
520204	Office Technologies Fundamentals +1	MicroTrain Technologies
520204	Office Technologies Fundamentals +2	MicroTrain Technologies
520204	Management - Manager /Supervisor	South Suburban College
520204	Management-Administrative Assistant	South Suburban College
520204	Supervision Cert BUS 22BK	College of Lake County
520205	Supervision Basics-	Kishwaukee College
520205	Internal Auditor for ISO 9001:2008	MCC Shah Center
520205	Manufacturing Processes	McHenry County College
520205	Industrial Management, Master of Science	Northern Illinois University
520205	Operations and Information Management, B.S.	Northern Illinois University

520205	Lean Six Sigma Black Belt	Premier Technology Consultants, Inc.
520205	Lean Six Sigma Green Belt	Premier Technology Consultants, Inc.
520206	Nonprofit and NGO Studies, B.A. or B.S.	Northern Illinois University
520211	Lean Six Sigma Green Belt and Agile	Directions Training Center, Inc
520211	Mastering Business Analysis and Agile	Directions Training Center, Inc
520211	PMP, Agile, Microsoft Office 2016, SharePoint and MS Project	Directions Training Center, Inc
520211	PMP Professional Exam Preparation Course	eConsulting Group, Inc.
520211	PMP Certification Exam Preparation	Illinois Institute of Technology
520211	Project Management Series (MGT 7215)	Joliet Junior College
520211	The Complete Project Manager	McHenry County College
520211	Project Management Professional +2	MicroTrain Technologies
520211	Project Management Professional +3	MicroTrain Technologies
520211	Project Management for CAPMÂ® & PMPÂ® Certification Prep	Northern Illinois University
520212	Retail Supervisor Training	Hill Foodservice Consulting
520212	Retail Training Academy	IDPL
520212	Retail Management	Moraine Valley Community College
520299	ASQ Six Sigma Back Belt Exam Prep Course	College of DuPage
520299	Lean Six Sigma Green Belt Certification	College of DuPage
520299	Business Analyst Program	DePaul University
520299	Data Analysis, Agile and Lean Six Sigma Green Belt	Directions Training Center, Inc
520299	Six Sigma Expert (1004944)	eConsulting Group, Inc.
520299	Associate in Applied Science in Business Adm	Midwestern Career College
520299	Microsoft Project	Premier Technology Consultants, Inc.
520301	Accounting Basic (RJD)	Arturo Velasquez Institute
520301	BS Degree in Business and Adm-Accounting	Chicago State University
520301	Accounting AAS 22AA	College of Lake County
520301	Professional Accounting Cert 22AB	College of Lake County
520301	Accounting AAS	Elgin Comm. College District #509
520301	Accounting Clerk B.C.	Harold Washington College
520301	Accounting (AAS)-BU020	Joliet Junior College
520301	Accountancy (Bachelor of Science)	Lewis University
520301	Accounting (AAS)	McHenry County College
520301	Accounting Program	Morton College
520301	Accountancy, B.S.	Northern Illinois University
520301	Accounting Science, Master of (MAS)	Northern Illinois University
520301	Accounting, Master of Accountancy (MAC)	Northern Illinois University
520301	Accounting AAS	Rasmussen College
520301	Accounting BS	Rasmussen College
520301	Accounting Advanced	Richard J Daley College
520301	Accounting Basic (RJD)	Richard J Daley College

520301	Accounting AAS 22AA	College of Lake County
520301	Professional Accounting Cert 22AB	College of Lake County
520301	CMA Preparation - Post Baccalaureate	Waubonsee Community College
520301	CPA Preparation - Post Baccalaureate	Waubonsee Community College
520302	Accounting - AAS Degree	College of DuPage
520302	Accounting Bookkeeping	College of DuPage
520302	Advanced Accounting	College of DuPage
520302	Paraprofessional Accountant	College of DuPage
520302	Medical Billing/Coding	Elim Outreach Training Center
520302	Accounting - Advanced (TRC)	Harry S. Truman College
520302	Accounting - Basic (TRC)	Harry S. Truman College
520302	Bookkeeping	Harry S. Truman College
520302	Accounting (COA)-BU030	Joliet Junior College
520302	Accounting	McHenry County College
520302	Office Adm/Assistant 6 Accounting and Bookkeeping	MicroTrain Technologies
520302	Accounting Assistant/Clerk	Moraine Valley Community College
520302	Accounting Associate	Oakton Community College
520302	Accounting Associate, AAS	Oakton Community College
520302	Accounting Technology	Oakton Community College
520302	Professional Accounting - CPA Preparation	Oakton Community College
520302	Accounting	Prairie State College
520302	Accounting	South Suburban College
520302	C306A Accounting Assistant	Triton College
520302	Accounting (AAS)	Waubonsee Community College
520302	Accounting	Waubonsee Community College
520302	Payroll & Tax Accounting	Waubonsee Community College
520302	Accounting AC	Wright College - North Campus
520302	Accounting Associates Degree	Wright College - North Campus
520302	Accounting BC	Wright College - North Campus
520303	IIA's Certified Internal Auditor Exam Review Series	Northern Illinois University
520305	Bookkeeping VS	Elgin Comm. College District #509
520305	Accounting (Bachelor of Science)	Governors State University
520305	Business Management	Morton College
520305	Accounting and Business Management AAS	Prairie State College
520399	Professional Bookkeeper Certification	Hill Foodservice Consulting
520399	Accounting	Rasmussen College
520401	Business Computer Applications	Chicago State University
520401	Business Essential	Chicago State University
520401	Administrative Assist. & Meeting/Event Planning	College of DuPage
520401	Administrative Support Essentials	College of DuPage
520401	Administrative Support Specialist	College of DuPage
520401	Excel 2016	College of DuPage

520401	Office Technology Specialist	College of DuPage
520401	PowerPoint 2016	College of DuPage
520401	Administrative Professional AAS 22SM	College of Lake County
520401	Business Management (PMP & Six Sigma Combo)	Computer Training Institute of Chicago
520401	Administrative Assistant Program-CTS	Computer Training Source, Inc.
520401	Administrative Professional Program-CTS	Computer Training Source, Inc.
520401	Adobe Creative Cloud & Microsoft Office Program	Computer Training Source, Inc.
520401	Executive Assistant Training Program	Computer Training Source, Inc.
520401	Microsoft Office Specialist (MOS) Program	Computer Training Source, Inc.
520401	MS Office/Web Maintenance/Quickbooks Program	Computer Training Source, Inc.
520401	Office Manager Training Program	Computer Training Source, Inc.
520401	QuickBooks ProAdvisor Training Program	Computer Training Source, Inc.
520401	QuickBooks Specialist Training Program	Computer Training Source, Inc.
520401	Office Admin Technology Professional AAS	Elgin Comm. College District #509
520401	Office Admin Technology Professional BVS	Elgin Comm. College District #509
520401	Business Administration-Advanced	Harry S. Truman College
520401	Administrative Level One Program	Hope Technology and Education Center
520401	Administrative Level Two Program	Hope Technology and Education Center
520401	Administrative Assistant (AAS)-CO809	Joliet Junior College
520401	Administrative Assistant (COA)-CO810	Joliet Junior College
520401	Office Systems	Kishwaukee College
520401	Administrative Professional AAS 22SM	LakeShore Campus
520401	PMP and MS Project Combo	Management & Information Tech Solutions
520401	Administrative Office Management	McHenry County College
520401	Microsoft Office Specialist	Moraine Valley Community College
520401	Office Technology Specialist	Morton College
520401	Administrative Assistant Program	Oakton Community College
520401	Administrative Professional AAS 22SM	College of Lake County
520402	Microsoft Office Specialist/Computer Repair (A+)	Computer Training Source, Inc.
520402	Medical Office Admin Technology Professional AAS	Elgin Comm. College District #509
520402	Office Admin Technology Professional VS	Elgin Comm. College District #509
520402	Executive Assistant	Joliet Junior College
520402	Executive Assistant Online	Oakton Community College
520407	Computer Office Skills	AACF/KAM Institute of Technology & Health
520407	Office Application Specialist AAS 22CB	College of Lake County
520407	Office Professional Cert 22SN	College of Lake County
520407	Office Professional Cert 22SN	LakeShore Campus
520407	Advanced Computer Skills	McHenry County College
520407	Computer Skills	McHenry County College
520407	Microsoft Office Specialist (0306)	Oakton Community College
520407	Office Professional Cert 22SN	College of Lake County
520407	C307 D Business Support Specialist	Triton College

520407	Computer Support	Waubonsee Community College
520408	Accounting Assistant / Bookkeeper	America Business College, Inc
520408	Bookkeeping Specialist	Computer Training Source, Inc.
520408	Administrative Assistant	Kishwaukee College
520409	Advanced Supply Chain Management Cert	College of Lake County
520409	Introduction to Supply Chain Management	College of Lake County
520409	Supply Chain Management AAS	College of Lake County
520409	Advanced Supply Chain Management Cert	LakeShore Campus
520409	Introduction to Supply Chain Management	LakeShore Campus
520409	Supply Chain Management AAS	LakeShore Campus
520409	Advanced Supply Chain Management Cert	College of Lake County
520409	Introduction to Supply Chain Management	College of Lake County
520409	Supply Chain Management AAS	College of Lake County
520410	Warehousing and Distribution	McHenry County College
520411	Computer Technologies for Professional Services	Pyramid Partnership
520499	Medical Office	College of DuPage
520499	Administrative Office Management (AAS)	McHenry County College
520499	Occupational Skills Training - Mail Services/shipping	Northpointe Resources
520499	Utility Clerk Training Program	Northpointe Resources
520499	Business Management	Rasmussen College
520601	Pre-clinical Dental Assisting	Elgin Comm. College District #509
520701	Business Environment and Concepts	College of DuPage
520701	Introductory Entrepreneurship BVS	Elgin Comm. College District #509
520701	IT Leadership, Innovation and Entrepreneurship	Illinois Institute of Technology
520701	IT Leadership, Innovation and Entrepreneurship +1	Illinois Institute of Technology
520701	IT Leadership, Innovation and Entrepreneurship +2	Illinois Institute of Technology
520703	Entrepreneurship/Sm Business Management	College of Lake County
520703	Intermediate Entrepreneurship VS	Elgin Comm. College District #509
520703	Entrepreneurship/Sm Business Management Cert	LakeShore Campus
520703	Entrepreneurship/Sm Business Management Cert	College of Lake County
520801	BS Degree in Business and Admininstration-Finance	Chicago State University
520801	Finance, of Graduate Study	Northern Illinois University
520801	Finance Bachelors	Rasmussen College
520803	Financial Clerk	America Business College, Inc
520803	Banking	Harold Washington College
520803	CPA Preparation-Post Baccalaureate	Harold Washington College
520899	Financial Services/Investment Analysis	Oakton Community College
520901	Lodging Manager	Hill Foodservice Consulting
520901	Hospitality Management (AAS)-CA400	Joliet Junior College
520901	Hospitality Management-AAS	Kennedy King College
520901	Hospitality Management-Advanced	Kennedy King College
520904	Hospitality Management Operations	College of DuPage

520905	Food Service Manager	Hill Foodservice Consulting
520905	Hospitality Management (COA)-CA410	Joliet Junior College
520907	Event Planning and Catering	Hill Foodservice Consulting
520909	Professional Restaurant Manager	Hill Foodservice Consulting
520999	Hospitality and Service Industry	Hill Foodservice Consulting
521001	Human Resource Management	College of DuPage
521001	American Payroll Association PayTrain	DePaul University
521001	Online Professional in Human Resource	DePaul University
521001	SHRM-CP and SHRM-SCP Certification Preparation	DePaul University
521001	Strategic Mgmt and Professional in HR Management	DePaul University
521001	PHR / SPHR Certification Preparation	Governors State University
521001	Human Resources-Basic	Harold Washington College
521001	Human Resources Management (COA)-BU580	Joliet Junior College
521001	Human Resources Management (COC)-BU585	Joliet Junior College
521001	Human Resources Management (Bachelor of Arts)	Lewis University
521001	Society for Human Recource Managment	Lewis University
521001	SHRM Learning System for SHRM-CP/SHRM-SCP	Northern Illinois University
521001	Human Resources and Organizational Leadership	Rasmussen College
521001	Human Resources Management (AAS)	Waubonsee Community College
521001	Human Resources Professional Program	Waubonsee Community College
521003	Organizational Leadership	Lewis University
521099	Prof in Human Resources- PHR/SPHR Exam Prep	College of DuPage
521099	Foundations of Human Resources Program	DePaul University
521099	Professional in Human Resources Program	DePaul University
521099	Human Resources Management AAS	Moraine Valley Community College
521099	Human Resource Specialist	Oakton Community College
521099	Human Resource Management C306F	Triton College
521101	International Business Studies	McHenry County College
521201	Management Information Systems, Cert.	Northern Illinois University
521201	Management Information Systems, Master	Northern Illinois University
521206	Information Technology Management	Lewis University
521206	Project Management	Management Info Tech Solutions, Inc.
521206	Management Associate Program	Management & Information Tech Solutions
521206	Project Management	Management & Information Tech Solutions
521206	Management Associate Program	Management & IT Solutions
521206	Project Management	Management & IT Solutions
521206	Management Associate Program	Management and IT Solutions
521206	Project Management	Management and IT Solutions
521206	PMP Certification Training	MicroTrain Technologies
521206	ITIL Foundation	Premier Technology Consultants, Inc.
521299	Project Management for IT Professionals	Illinois Institute of Technology
521301	Data Analytics, Master of Science	Northern Illinois University

521399	Business Advanced	Arturo Velasquez Institute
521399	Project Management Program	DePaul University
521399	Business Advanced	Richard J Daley College
521401	PMP or CAPM and Marketing	Directions Training Center, Inc
521401	Associate of Applied Science in Business	Elgin Comm. College District #509
521401	Marketing BVS	Elgin Comm. College District #509
521401	Marketing Management (AAS)-BU556	Joliet Junior College
521401	Marketing (AAS)	McHenry County College
521401	Marketing Management	McHenry County College
521401	Marketing, B.S.	Northern Illinois University
521401	Marketing - Bachelor's Degree	Rasmussen College
521401	Marketing AAS	Rasmussen College
521499	Marketing (BC)	Wright College
521501	Home Inspection PRLE 40	College of Lake County
521601	Taxation, Master of Science	Northern Illinois University
521701	Financial Services Program	Angel of God Resource
521701	Talent Pipeline Apprenticeship	Harold Washington Community College
521801	Marketing AAS Degree	College of DuPage
521801	Marketing	College of DuPage
521803	Retailing	Kishwaukee College
521803	Marketing	Waubonsee Community College
521804	Marketing (Cert) 22BG	College of Lake County
521804	Marketing (Cert) 22BG	LakeShore Campus
521804	Marketing (Cert) 22BG	College of Lake County
521905	Meeting & Event Planning	College of DuPage
521910	Hospitality Industry Administration Hotel/Motel	Triton College
522001	Construction Management	College of DuPage
522001	Construction Management (AAS)	McHenry County College
522001	Construction Management AAS	Waubonsee Community College
522001	Construction Management	Waubonsee Community College
529999	Agile Project Management: PMI-ACP	College of DuPage
529999	Certified ScrumMaster®	College of DuPage
529999	Project Management	College of DuPage
529999	Project Management Series	College of Lake County
529999	Salesforce Administration and Application Developer	COMNet Group Inc.
529999	Social Media Administrator-Part Time	Computer Training Institute of Chicago
600411	Radiologic Technology (AAS)-NU090	Joliet Junior College
600545	Magnetic Resonance Imaging (MRI) Technologist	Midwestern Career College

Appendix E – Opportunity Youth Geography

The data to quantify these youths is by Public Use Microdata Area (PUMA) and several overlap the Harper district. Figure 90 shows the PUMA delineation in the Harper region from 2010 (3008, 3308, 3401, 3415, 3417, 3418, 3419, and 3602). A PUMA is drawn every ten years from the Decennial Census results based upon areas of population over 100,000. The purpose is to provide detailed data for more in-depth analysis. Below is a map of the Harper district and respective overlapping PUMA. The aggregation of data for the Opportunity Youth is larger than the Harper district.

Figure 90: Harper Region Compared to Overlapping PUMAs

Harper College
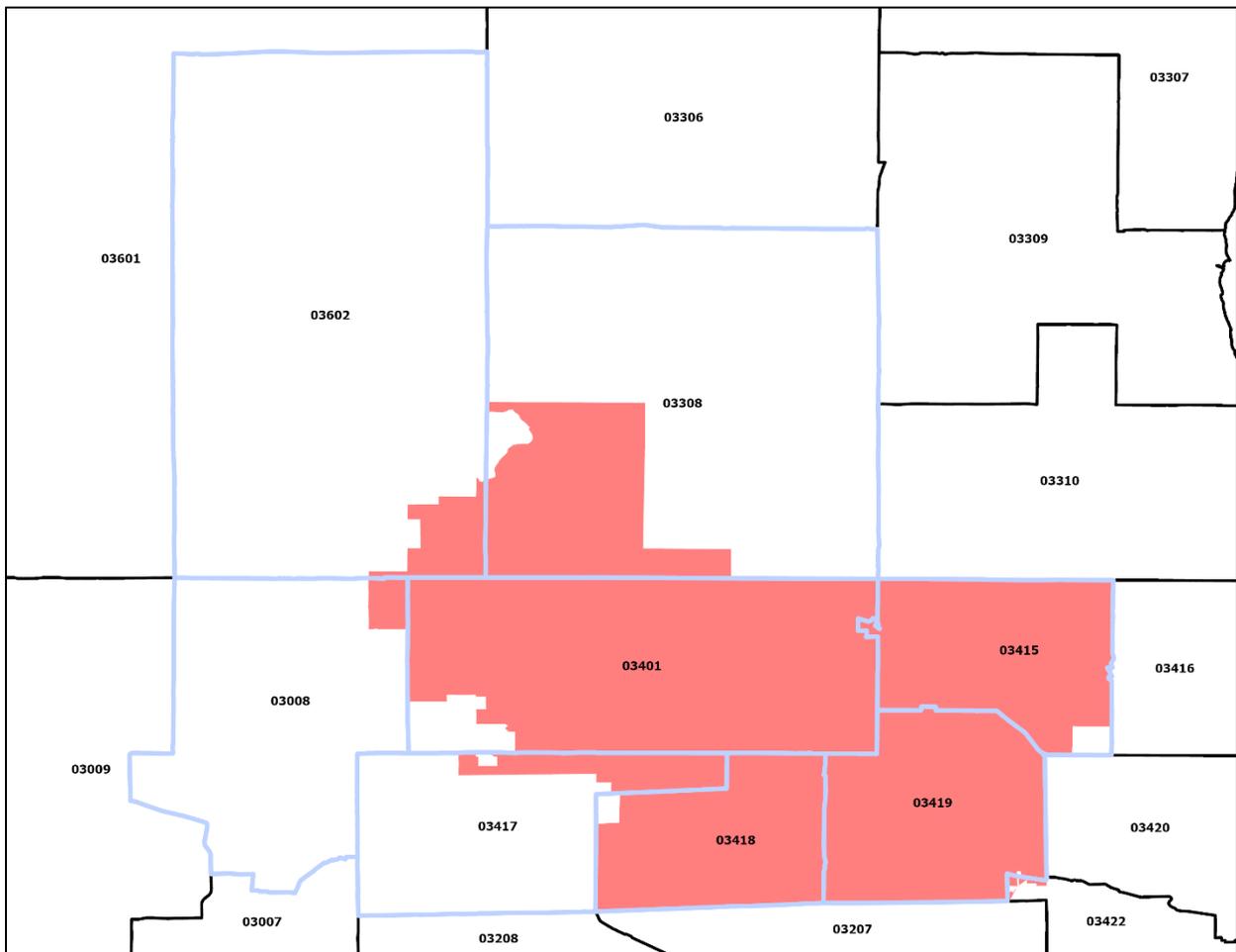
Appendix F – Characteristics of Occupations Requiring Post-High School Credentials or an Associate degree Mapped to Harper Programs

SOC	Description	2019 Jobs	2010 - 2019 % Change	2019 - 2029 % Change
43-9061	Office Clerks, General	89,121	2.1%	-2.3%
29-1141	Registered Nurses	70,156	12.4%	8.3%
11-1021	General and Operations Managers	65,573	30.5%	3.3%
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	38,154	10.1%	-2.7%
33-9032	Security Guards	33,853	16.6%	8.6%
49-9071	Maintenance and Repair Workers, General	33,356	11.0%	4.9%
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	33,264	-3.3%	-4.9%
13-2011	Accountants and Auditors	32,780	17.0%	5.8%
25-1099	Postsecondary Teachers	32,036	4.6%	10.7%
25-9041	Teacher Assistants	29,067	6.4%	5.8%
25-2021	Elementary School Teachers, Except Special Education	28,964	-5.5%	3.5%
41-3099	Sales Representatives, Services, All Other	28,721	76.5%	3.7%
31-1014	Nursing Assistants	28,063	5.5%	10.8%
11-9199	Managers, All Other	27,864	36.9%	1.0%
43-3031	Bookkeeping, Accounting, and Auditing Clerks	25,939	-13.0%	-0.8%
35-2014	Cooks, Restaurant	25,453	50.0%	12.8%
13-1111	Management Analysts	24,815	22.5%	7.7%
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	19,787	-0.6%	3.9%
33-3051	Police and Sheriff's Patrol Officers	17,997	0.7%	2.4%
15-1132	Software Developers, Applications	17,921	85.6%	24.3%
41-1011	First-Line Supervisors of Retail Sales Workers	17,607	-6.2%	0.0%
43-6011	Executive Secretaries and Executive Administrative Assistants	16,134	-43.9%	-15.3%
41-3021	Insurance Sales Agents	15,438	9.1%	1.4%
11-2022	Sales Managers	13,908	15.6%	-0.7%
13-1071	Human Resources Specialists	13,834	52.9%	4.3%
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	13,562	20.2%	12.4%
39-9011	Childcare Workers	12,225	1.7%	18.7%
31-9092	Medical Assistants	11,865	21.9%	17.8%
11-3021	Computer and Information Systems Managers	10,577	32.1%	7.2%
25-2022	Middle School Teachers, Except Special and Career/Technical Education	10,464	-6.8%	4.1%
11-9051	Food Service Managers	10,040	24.3%	6.8%
11-3011	Administrative Services Managers	9,898	16.2%	3.0%
23-2011	Paralegals and Legal Assistants	9,820	25.0%	9.5%
15-1133	Software Developers, Systems Software	9,731	7.6%	6.4%
15-1199	Computer Occupations, All Other	9,477	142.8%	7.2%
33-2011	Firefighters	9,218	3.2%	1.5%
29-2061	Licensed Practical and Licensed Vocational Nurses	8,758	-10.1%	13.0%
43-3071	Tellers	8,136	-26.7%	1.3%

43-6013	Medical Secretaries	7,858	10.4%	18.3%
21-1093	Social and Human Service Assistants	7,710	14.4%	11.7%
43-5061	Production, Planning, and Expediting Clerks	7,503	21.8%	0.8%
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	7,488	-20.8%	-3.5%
11-9111	Medical and Health Services Managers	7,374	23.5%	11.5%
13-1031	Claims Adjusters, Examiners, and Investigators	7,227	18.3%	13.4%
13-1022	Wholesale and Retail Buyers, Except Farm Products	7,191	-5.4%	-7.9%
13-1028	Buyers and Purchasing Agents	7,191	-5.4%	-7.9%
27-1024	Graphic Designers	6,796	7.9%	-2.5%
51-9198	Helpers--Production Workers	6,769	-17.1%	9.5%
11-9021	Construction Managers	6,568	46.8%	4.7%
11-3121	Human Resources Managers	5,869	80.4%	1.3%
41-3011	Advertising Sales Agents	5,737	-5.3%	-9.1%
15-1152	Computer Network Support Specialists	5,672	28.5%	1.6%
43-3011	Bill and Account Collectors	5,541	-41.6%	-4.6%
15-1131	Computer Programmers	5,540	-34.3%	-6.1%
43-9041	Insurance Claims and Policy Processing Clerks	5,482	16.1%	18.1%
13-1151	Training and Development Specialists	5,438	28.4%	7.4%
51-3011	Bakers	5,278	21.1%	2.1%
11-1011	Chief Executives	5,199	-32.9%	-8.0%
11-9041	Architectural and Engineering Managers	4,978	7.8%	-2.3%
11-3051	Industrial Production Managers	4,967	16.6%	-8.5%
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	4,748	11.1%	7.7%
11-3071	Transportation, Storage, and Distribution Managers	4,746	33.4%	1.6%
43-4131	Loan Interviewers and Clerks	4,737	10.6%	4.6%
51-5112	Printing Press Operators	4,567	-15.7%	-15.9%
29-2021	Dental Hygienists	4,515	13.9%	13.9%
43-9021	Data Entry Keyers	4,305	-24.6%	-15.1%
51-4121	Welders, Cutters, Solderers, and Brazers	4,203	11.2%	-1.4%
49-9099	Installation, Maintenance, and Repair Workers, All Other	4,164	23.9%	-1.1%
29-2034	Radiologic Technologists	4,073	3.5%	7.3%
29-2071	Medical Records and Health Information Technicians	4,062	19.8%	10.7%
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3,768	28.0%	14.2%
41-2022	Parts Salespersons	3,760	11.4%	-0.7%
41-1012	First-Line Supervisors of Non-Retail Sales Workers	3,438	-9.7%	3.9%
33-1012	First-Line Supervisors of Police and Detectives	3,350	10.2%	1.6%
13-2053	Insurance Underwriters	3,332	2.1%	0.3%
29-2041	Emergency Medical Technicians and Paramedics	3,317	6.6%	0.9%
15-1134	Web Developers	3,148	59.5%	9.8%
35-1011	Chefs and Head Cooks	2,924	44.8%	9.9%
31-9011	Massage Therapists	2,848	58.5%	18.3%
11-9151	Social and Community Service Managers	2,730	11.4%	12.2%
13-1051	Cost Estimators	2,590	4.6%	2.9%
43-5011	Cargo and Freight Agents	2,587	13.1%	19.2%
13-1075	Labor Relations Specialists	2,555	13.6%	-13.6%
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	2,465	2.9%	-7.0%
17-3029	Engineering Technicians, Except Drafters, All Other	2,447	29.1%	-2.8%
31-9097	Phlebotomists	2,434	34.9%	22.1%
41-3041	Travel Agents	2,404	-9.0%	-17.2%

37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	2,393	-20.3%	6.9%
11-3061	Purchasing Managers	2,344	1.6%	-3.7%
43-3051	Payroll and Timekeeping Clerks	2,256	-24.2%	1.6%
13-2082	Tax Preparers	2,224	28.7%	8.7%
13-2041	Credit Analysts	2,194	11.4%	1.6%
27-2042	Musicians and Singers	2,181	-4.0%	1.8%
15-1122	Information Security Analysts	2,135	87.0%	18.1%
25-2012	Kindergarten Teachers, Except Special Education	2,113	-24.6%	4.8%
43-4011	Brokerage Clerks	2,096	-15.6%	2.0%
13-1141	Compensation, Benefits, and Job Analysis Specialists	2,095	-26.1%	8.2%
17-2199	Engineers, All Other	1,906	0.8%	1.4%
33-3021	Detectives and Criminal Investigators	1,871	-17.0%	0.6%
29-2051	Dietetic Technicians	1,731	47.3%	6.0%
21-1099	Community and Social Service Specialists, All Other	1,712	9.4%	8.2%
17-3023	Electrical and Electronics Engineering Technicians	1,632	-24.7%	-0.5%
29-2032	Diagnostic Medical Sonographers	1,583	32.2%	15.4%
43-4141	New Accounts Clerks	1,581	-45.6%	-7.1%
11-3131	Training and Development Managers	1,570	26.4%	1.5%
43-5031	Police, Fire, and Ambulance Dispatchers	1,559	-4.4%	2.9%
17-2072	Electronics Engineers, Except Computer	1,477	-17.0%	-6.0%
29-2031	Cardiovascular Technologists and Technicians	1,460	13.8%	5.4%
27-1011	Art Directors	1,407	27.5%	1.0%
27-4021	Photographers	1,403	-5.1%	-40.4%
27-1025	Interior Designers	1,394	28.1%	-2.7%
43-3061	Procurement Clerks	1,333	-11.9%	-3.6%
13-2061	Financial Examiners	1,280	120.1%	7.2%
35-2019	Cooks, All Other	1,278	5.4%	6.1%
17-3011	Architectural and Civil Drafters	1,269	1.2%	4.6%
27-3091	Interpreters and Translators	1,227	27.7%	13.4%
41-9099	Sales and Related Workers, All Other	1,167	-25.0%	5.8%
29-2035	Magnetic Resonance Imaging Technologists	1,107	37.0%	8.8%
11-9121	Natural Sciences Managers	1,100	6.6%	-5.1%
49-9098	Helpers--Installation, Maintenance, and Repair Workers	1,091	-20.6%	9.8%
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	1,024	-23.2%	-3.6%
31-2011	Occupational Therapy Assistants	879	37.7%	20.3%
25-3011	Adult Basic and Secondary Education and Literacy Teachers and Instructors	855	-23.8%	-5.4%
33-3011	Bailiffs	845	2.0%	-4.4%
13-2031	Budget Analysts	817	-10.3%	4.0%
17-3026	Industrial Engineering Technicians	740	-3.1%	-5.0%
13-2071	Credit Counselors	681	6.9%	8.0%
11-9081	Lodging Managers	620	29.5%	10.2%
11-3111	Compensation and Benefits Managers	616	-39.3%	-0.2%
23-2093	Title Examiners, Abstractors, and Searchers	565	-5.9%	4.7%
13-2081	Tax Examiners and Collectors, and Revenue Agents	563	-36.4%	-4.0%
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	562	-20.4%	-14.2%
21-1094	Community Health Workers	545	41.0%	17.8%
33-9021	Private Detectives and Investigators	532	-7.0%	14.0%
23-2099	Legal Support Workers, All Other	530	-2.6%	3.0%
51-5111	Prepress Technicians and Workers	514	-45.2%	-19.2%

27-1014	Multimedia Artists and Animators	504	0.5%	10.2%
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	450	-28.5%	-17.0%
43-9031	Desktop Publishers	443	-44.0%	-22.0%
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	429	34.6%	0.6%
49-2092	Electric Motor, Power Tool, and Related Repairers	383	-17.5%	-3.3%
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	346	-29.9%	-6.5%
43-9111	Statistical Assistants	325	8.8%	3.9%
43-9022	Word Processors and Typists	298	-50.7%	-15.0%
29-1124	Radiation Therapists	284	8.0%	7.7%
43-4041	Credit Authorizers, Checkers, and Clerks	247	-60.2%	0.9%
19-4092	Forensic Science Technicians	233	23.7%	10.4%
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	215	-29.5%	8.6%
13-1011	Agents and Business Managers of Artists, Performers, and Athletes	211	9.9%	1.1%
11-9161	Emergency Management Directors	200	-16.8%	1.4%
13-1032	Insurance Appraisers, Auto Damage	192	35.9%	29.4%
17-3019	Drafters, All Other	152	-18.7%	-1.3%
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	141	12.1%	2.5%
33-2021	Fire Inspectors and Investigators	141	12.1%	2.5%
15-1111	Computer and Information Research Scientists	136	-26.6%	23.0%
17-3024	Electro-Mechanical Technicians	124	-31.6%	-3.3%
17-1021	Cartographers and Photogrammetrists	99	-12.7%	15.8%
51-6092	Fabric and Apparel Patternmakers	92	5.4%	-8.0%
27-1022	Fashion Designers	87	-14.6%	9.3%
51-9141	Semiconductor Processors	84	33.1%	-5.1%
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	79	-13.2%	10.9%
33-3052	Transit and Railroad Police	55	15.6%	9.5%
27-1019	Artists and Related Workers, All Other	55	-28.5%	7.5%
35-2013	Cooks, Private Household	31	6.0%	5.0%
33-2022	Forest Fire Inspectors and Prevention Specialists	21	60.1%	15.5%

Source: Illinois Department of Employment Security, Harper Region (Cook, Lake and McHenry counties in Illinois).
Additional data such as Median Annual Earnings have been provided in the Excel workbook.

Appendix G – Job Openings – Education & Experience

SOC Code	Description	Annual Replacement Openings (2019)	Annual Openings (2019)	Pct. Replacement Openings (2019)	Typical Entry Level Education	Work Experience in a Related Occupation	Typical OJT**
11-1011	Chief Executives	407	408	99.6%	Bachelor's	> 5 yrs	None
11-1021	General and Operations Managers	5,050	5,975	84.5%	Bachelor's	> 5 yrs	None
11-2022	Sales Managers	1,121	1,223	91.6%	Bachelor's	< 5 yrs	None
11-3011	Administrative Services Managers	772	880	87.8%	Bachelor's	< 5 yrs	None
11-3021	Computer and Information Systems Managers	727	904	80.5%	Bachelor's	> 5 yrs	None
11-3051	Industrial Production Managers	324	367	88.2%	Bachelor's	> 5 yrs	None
11-3061	Purchasing Managers	182	194	93.9%	Bachelor's	> 5 yrs	None
11-3071	Transportation, Storage, and Distribution Managers	336	411	81.8%	HS Diploma	> 5 yrs	None
11-3111	Compensation and Benefits Managers	47	49	97.2%	Bachelor's	> 5 yrs	None
11-3121	Human Resources Managers	416	564	73.7%	Bachelor's	> 5 yrs	None
11-3131	Training and Development Managers	129	153	84.2%	Bachelor's	> 5 yrs	None
11-9021	Construction Managers	409	539	75.9%	Bachelor's	None	Moderate-term OJT
11-9041	Architectural and Engineering Managers	330	359	92.0%	Bachelor's	> 5 yrs	None
11-9051	Food Service Managers	1,018	1,161	87.7%	HS Diploma	< 5 yrs	None
11-9081	Lodging Managers	59	71	83.8%	HS Diploma	< 5 yrs	None
11-9111	Medical and Health Services Managers	545	666	81.8%	Bachelor's	< 5 yrs	None
11-9121	Natural Sciences Managers	84	96	87.3%	Bachelor's	> 5 yrs	None
11-9151	Social and Community Service Managers	230	276	83.4%	Bachelor's	< 5 yrs	None
11-9161	Emergency Management Directors	16	18	86.2%	Bachelor's	> 5 yrs	None
11-9199	Managers, All Other	1,752	2,209	79.3%	Bachelor's	< 5 yrs	None
13-1011	Agents and Business Managers of Artists, Performers, and Athletes	23	28	82.2%	Bachelor's	< 5 yrs	None
13-1022	Wholesale and Retail Buyers, Except Farm Products	672	686	97.9%	Bachelor's	None	Moderate-term OJT
13-1031	Claims Adjusters, Examiners, and Investigators	568	719	79.0%	HS Diploma	None	Long-term OJT
13-1032	Insurance Appraisers, Auto Damage	16	23	68.3%	Certificate	None	Moderate-term OJT
13-1051	Cost Estimators	252	273	92.4%	Bachelor's	None	Moderate-term OJT
13-1071	Human Resources Specialists	1,210	1,508	80.2%	Bachelor's	None	None
13-1075	Labor Relations Specialists	232	258	89.8%	Bachelor's	< 5 yrs	None
13-1111	Management Analysts	2,017	2,389	84.4%	Bachelor's	< 5 yrs	None
13-1141	Compensation, Benefits, and Job Analysis Specialists	176	191	92.1%	Bachelor's	< 5 yrs	None
13-1151	Training and Development Specialists	494	590	83.8%	Bachelor's	< 5 yrs	None

13-2011	Accountants and Auditors	2,832	3,210	88.2%	Bachelor's	None	None
13-2031	Budget Analysts	62	65	94.5%	Bachelor's	None	None
13-2041	Credit Analysts	171	197	86.7%	Bachelor's	None	None
13-2053	Insurance Underwriters	254	283	89.7%	Bachelor's	None	Moderate-term OJT
13-2061	Financial Examiners	82	123	66.3%	Bachelor's	None	Long-term OJT
13-2071	Credit Counselors	55	65	84.5%	Bachelor's	None	Moderate-term OJT
13-2081	Tax Examiners and Collectors, and Revenue Agents	43	43	99.9%	Bachelor's	None	Moderate-term OJT
13-2082	Tax Preparers	233	283	82.4%	HS Diploma	None	Moderate-term OJT
15-1111	Computer and Information Research Scientists	10	13	76.7%	Master's	None	None
15-1122	Information Security Analysts	133	206	64.6%	Bachelor's	< 5 yrs	None
15-1131	Computer Programmers	388	389	99.8%	Bachelor's	None	None
15-1132	Software Developers, Applications	1,072	1,739	61.6%	Bachelor's	None	None
15-1133	Software Developers, Systems Software	611	722	84.6%	Bachelor's	None	None
15-1134	Web Developers	213	299	71.2%	Associate's	None	None
15-1152	Computer Network Support Specialists	399	496	80.6%	Associate's	None	None
15-1199	Computer Occupations, All Other	524	864	60.6%	Bachelor's	None	None
17-1021	Cartographers and Photogrammetrists	8	9	79.8%	Bachelor's	None	None
17-2072	Electronics Engineers, Except Computer	96	100	96.0%	Bachelor's	None	None
17-2199	Engineers, All Other	118	139	84.8%	Bachelor's	None	None
17-3011	Architectural and Civil Drafters	108	120	89.6%	Associate's	None	None
17-3023	Electrical and Electronics Engineering Technicians	149	152	97.7%	Associate's	None	None
17-3024	Electro-Mechanical Technicians	11	12	94.4%	Associate's	None	None
17-3026	Industrial Engineering Technicians	63	68	91.9%	Associate's	None	None
17-3029	Engineering Technicians, Except Drafters, All Other	192	229	83.9%	Associate's	None	None
19-4092	Forensic Science Technicians	26	31	84.6%	Bachelor's	None	Moderate-term OJT
21-1093	Social and Human Service Assistants	896	1,009	88.8%	HS Diploma	None	Short-term OJT
21-1094	Community Health Workers	65	81	80.4%	HS Diploma	None	Short-term OJT
21-1099	Community and Social Service Specialists, All Other	212	239	88.6%	Bachelor's	None	None
23-2011	Paralegals and Legal Assistants	951	1,107	85.9%	Associate's	None	None
23-2093	Title Examiners, Abstractors, and Searchers	47	52	90.4%	HS Diploma	None	Moderate-term OJT
23-2099	Legal Support Workers, All Other	45	51	86.7%	Associate's	None	None
25-1099	Postsecondary Teachers	2,484	2,832	87.7%	Doctoral or professional	None	None
25-2012	Kindergarten Teachers, Except Special Education	226	238	94.7%	Bachelor's	None	None
25-2021	Elementary School Teachers, Except Special Education	2,057	2,185	94.2%	Bachelor's	None	None
25-2022	Middle School Teachers, Except Special and Career/Technical Education	758	809	93.7%	Bachelor's	None	None
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	1,342	1,454	92.3%	Bachelor's	None	None

25-3011	Adult Basic and Secondary Education and Literacy Teachers and Instructors	101	106	95.1%	Bachelor's	None	None
25-9041	Teacher Assistants	2,910	3,144	92.5%	Some college	None	None
27-1011	Art Directors	104	122	85.1%	Bachelor's	> 5 yrs	None
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	7	10	72.5%	Bachelor's	None	Long-term OJT
27-1014	Multimedia Artists and Animators	41	47	87.2%	Bachelor's	None	None
27-1019	Artists and Related Workers, All Other	5	6	81.2%	No formal credential	None	Long-term OJT
27-1022	Fashion Designers	9	10	81.8%	Bachelor's	None	None
27-1024	Graphic Designers	608	644	94.5%	Bachelor's	None	None
27-1025	Interior Designers	120	139	86.5%	Bachelor's	None	None
27-2042	Musicians and Singers	210	221	94.9%	No formal credential	None	Long-term OJT
27-3091	Interpreters and Translators	108	135	80.0%	Bachelor's	None	None
27-4021	Photographers	103	120	86.0%	HS Diploma	None	Long-term OJT
29-1124	Radiation Therapists	13	18	74.4%	Associate's	None	None
29-1141	Registered Nurses	3,487	4,251	82.0%	Bachelor's	None	None
29-2021	Dental Hygienists	267	334	80.2%	Associate's	None	None
29-2031	Cardiovascular Technologists and Technicians	73	89	82.4%	Associate's	None	None
29-2032	Diagnostic Medical Sonographers	78	113	69.5%	Associate's	None	None
29-2034	Radiologic Technologists	209	242	86.3%	Associate's	None	None
29-2035	Magnetic Resonance Imaging Technologists	53	75	71.5%	Associate's	< 5 yrs	None
29-2041	Emergency Medical Technicians and Paramedics	194	226	85.8%	Certificate	None	None
29-2051	Dietetic Technicians	124	159	77.9%	Associate's	None	None
29-2061	Licensed Practical and Licensed Vocational Nurses	648	719	90.2%	Certificate	None	None
29-2071	Medical Records and Health Information Technicians	235	301	78.3%	Certificate	None	None
31-1014	Nursing Assistants	3,171	3,423	92.7%	Certificate	None	None
31-2011	Occupational Therapy Assistants	105	129	80.9%	Associate's	None	None
31-9011	Massage Therapists	279	362	76.9%	Certificate	None	None
31-9092	Medical Assistants	1,243	1,475	84.3%	Certificate	None	None
31-9097	Phlebotomists	243	308	78.7%	Certificate	None	None
33-1012	First-Line Supervisors of Police and Detectives	188	219	86.0%	HS Diploma	< 5 yrs	Moderate-term OJT
33-2011	Firefighters	597	641	93.1%	Certificate	None	Long-term OJT
33-2021	Fire Inspectors and Investigators	14	15	88.5%	Certificate	> 5 yrs	Moderate-term OJT
33-2022	Forest Fire Inspectors and Prevention Specialists	2	3	68.9%	HS Diploma	< 5 yrs	Moderate-term OJT
33-3011	Bailiffs	66	70	94.1%	HS Diploma	None	Moderate-term OJT
33-3021	Detectives and Criminal Investigators	121	123	98.5%	HS Diploma	< 5 yrs	Moderate-term OJT
33-3051	Police and Sheriff's Patrol Officers	1,134	1,219	93.0%	HS Diploma	None	Moderate-term OJT
33-3052	Transit and Railroad Police	3	6	56.1%	HS Diploma	None	Moderate-term OJT

33-9021	Private Detectives and Investigators	52	66	78.6%	HS Diploma	< 5 yrs	Moderate-term OJT
35-1011	Chefs and Head Cooks	350	421	83.1%	HS Diploma	> 5 yrs	None
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	1,893	2,104	89.9%	HS Diploma	< 5 yrs	None
35-2013	Cooks, Private Household	4	5	82.7%	Certificate	< 5 yrs	None
35-2014	Cooks, Restaurant	3,377	3,996	84.5%	No formal credential	< 5 yrs	Moderate-term OJT
35-2019	Cooks, All Other	177	210	84.5%	No formal credential	None	Moderate-term OJT
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	288	300	96.1%	HS Diploma	< 5 yrs	None
39-9011	Childcare Workers	1,840	2,047	89.9%	HS Diploma	None	Short-term OJT
41-1011	First-Line Supervisors of Retail Sales Workers	1,888	1,938	97.4%	HS Diploma	< 5 yrs	None
41-1012	First-Line Supervisors of Non-Retail Sales Workers	316	333	95.1%	HS Diploma	< 5 yrs	None
41-2022	Parts Salespersons	453	479	94.6%	No formal credential	None	Moderate-term OJT
41-3011	Advertising Sales Agents	725	775	93.5%	HS Diploma	None	Moderate-term OJT
41-3021	Insurance Sales Agents	1,445	1,692	85.4%	HS Diploma	None	Moderate-term OJT
41-3041	Travel Agents	268	291	92.3%	HS Diploma	None	Moderate-term OJT
41-3099	Sales Representatives, Services, All Other	3,126	3,892	80.3%	HS Diploma	None	Moderate-term OJT
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	776	808	96.0%	Bachelor's	None	Moderate-term OJT
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	3,333	3,415	97.6%	HS Diploma	None	Moderate-term OJT
41-9099	Sales and Related Workers, All Other	159	167	95.7%	HS Diploma	None	None
43-3011	Bill and Account Collectors	674	684	98.6%	HS Diploma	None	Moderate-term OJT
43-3031	Bookkeeping, Accounting, and Auditing Clerks	2,946	2,973	99.1%	Some college, no	None	Moderate-term OJT
43-3051	Payroll and Timekeeping Clerks	241	246	97.9%	HS Diploma	None	Moderate-term OJT
43-3061	Procurement Clerks	145	151	96.3%	HS Diploma	None	Moderate-term OJT
43-3071	Tellers	1,020	1,042	97.9%	HS Diploma	None	Short-term OJT
43-4011	Brokerage Clerks	226	234	96.7%	HS Diploma	None	Moderate-term OJT
43-4041	Credit Authorizers, Checkers, and Clerks	33	34	97.4%	HS Diploma	None	Moderate-term OJT
43-4131	Loan Interviewers and Clerks	449	509	88.1%	HS Diploma	None	Short-term OJT
43-4141	New Accounts Clerks	188	189	99.0%	HS Diploma	None	Moderate-term OJT
43-5011	Cargo and Freight Agents	213	279	76.1%	HS Diploma	None	Short-term OJT
43-5061	Production, Planning, and Expediting Clerks	713	793	90.0%	HS Diploma	None	Moderate-term OJT
43-6011	Executive Secretaries and Executive Administrative Assistants	1,920	1,920	100.0%	HS Diploma	< 5 yrs	None
43-6013	Medical Secretaries	847	973	87.0%	HS Diploma	None	Moderate-term OJT
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	4,056	4,535	89.4%	HS Diploma	None	Short-term OJT

43-9021	Data Entry Keyers	528	533	99.1%	HS Diploma	None	Short-term OJT
43-9022	Word Processors and Typists	39	40	97.1%	HS Diploma	None	Short-term OJT
43-9031	Desktop Publishers	52	53	97.9%	Associate's	None	Short-term OJT
43-9041	Insurance Claims and Policy Processing Clerks	538	660	81.6%	HS Diploma	None	Moderate-term OJT
43-9061	Office Clerks, General	10,276	10,683	96.2%	HS Diploma	None	Short-term OJT
43-9111	Statistical Assistants	40	47	85.0%	Bachelor's	None	None
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	441	504	87.4%	HS Diploma	> 5 yrs	None
49-2092	Electric Motor, Power Tool, and Related Repairers	37	39	94.9%	HS Diploma	< 5 yrs	Moderate-term OJT
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	95	99	95.7%	Certificate	None	Long-term OJT
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	351	426	82.3%	Certificate	None	Long-term OJT
49-9071	Maintenance and Repair Workers, General	3,154	3,433	91.9%	HS Diploma	None	Moderate-term OJT
49-9099	Installation, Maintenance, and Repair Workers, All Other	376	424	88.9%	HS Diploma	None	Moderate-term OJT
51-3011	Bakers	721	791	91.1%	No formal credential	None	Long-term OJT
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	238	258	92.2%	HS Diploma	None	Moderate-term OJT
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	42	52	81.1%	Certificate	None	Moderate-term OJT
51-4121	Welders, Cutters, Solderers, and Brazers	431	468	92.2%	HS Diploma	None	Moderate-term OJT
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	66	75	87.2%	HS Diploma	None	Moderate-term OJT
51-5111	Prepress Technicians and Workers	67	68	98.8%	Certificate	None	None
51-5112	Printing Press Operators	463	483	95.8%	HS Diploma	None	Moderate-term OJT
51-6092	Fabric and Apparel Patternmakers	11	13	84.2%	HS Diploma	None	Moderate-term OJT
51-9141	Semiconductor Processors	9	11	80.4%	HS Diploma	None	Moderate-term OJT
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	34	38	89.0%	HS Diploma	None	Moderate-term OJT

Source: EMSI, 2019.

Appendix H – Change in Wages Mapped to Harper Programs

SOC Code	Occupation Title	2014 Median Annual Wage	2018 Median Annual Wage	Trend 2014-2018
11-1011	Chief Executives	$179,115	$235,154	31.3%
11-1021	General and Operations Managers	$99,940	$113,746	13.8%
11-2022	Sales Managers	$112,270	$122,920	9.5%
11-3011	Administrative Services Managers	$73,221	$95,098	29.9%
11-3021	Computer and Information Systems Managers	$125,262	$143,196	14.3%
11-3051	Industrial Production Managers	$92,200	$101,519	10.1%
11-3061	Purchasing Managers	$98,509	$109,573	11.2%
11-3071	Transportation, Storage, and Distribution Managers	$83,667	$94,159	12.5%
11-3111	Compensation and Benefits Managers	$101,727	$119,651	17.6%
11-3121	Human Resources Managers	$100,994	$113,376	12.3%
11-3131	Training and Development Managers	$102,796	$116,865	13.7%
11-9021	Construction Managers	$96,848	$94,589	-2.3%
11-9041	Architectural and Engineering Managers	$125,617	$132,278	5.3%
11-9051	Food Service Managers	$49,949	$53,554	7.2%
11-9081	Lodging Managers	$47,984	$41,584	-13.3%
11-9111	Medical and Health Services Managers	$101,251	$110,181	8.8%
11-9121	Natural Sciences Managers	$125,629	$118,787	-5.4%
11-9151	Social and Community Service Managers	$63,667	$65,265	2.5%
11-9161	Emergency Management Directors	$51,250	$81,500	59.0%
11-9199	Managers, All Other	$102,788	$86,769	-15.6%
13-1011	Agents and Business Managers of Artists, Performers, and Athletes	$44,229	$48,659	10.0%
13-1028	Buyers and Purchasing Agents	$61,322	$64,271	4.8%
13-1031	Claims Adjusters, Examiners, and Investigators	$69,881	$67,599	-3.3%
13-1032	Insurance Appraisers, Auto Damage	$67,590	$65,482	-3.1%
13-1051	Cost Estimators	$64,988	$65,340	0.5%
13-1071	Human Resources Specialists	$58,577	$59,288	1.2%
13-1075	Labor Relations Specialists	$59,500	$63,657	7.0%
13-1111	Management Analysts	$90,048	$88,662	-1.5%
13-1141	Compensation, Benefits, and Job Analysis Specialists	$60,776	$65,748	8.2%
13-1151	Training and Development Specialists	$61,295	$66,779	8.9%
13-2011	Accountants and Auditors	$69,985	$76,958	10.0%
13-2031	Budget Analysts	$77,153	$75,071	-2.7%
13-2041	Credit Analysts	$70,918	$71,441	0.7%
13-2053	Insurance Underwriters	$67,320	$76,024	12.9%
13-2061	Financial Examiners	$88,305	$100,845	14.2%
13-2071	Credit Counselors	$47,484	$43,588	-8.2%
13-2081	Tax Examiners and Collectors, and Revenue Agents	$82,874	$87,149	5.2%
13-2082	Tax Preparers	$47,238	$29,465	-37.6%
15-1111	Computer and Information Research Scientists	$95,588	$115,491	20.8%
15-1122	Information Security Analysts	$95,815	$101,652	6.1%
15-1131	Computer Programmers	$76,921	$91,302	18.7%
15-1132	Software Developers, Applications	$90,471	$100,008	10.5%
15-1133	Software Developers, Systems Software	$101,019	$112,582	11.4%

15-1134	Web Developers	$68,539	$74,891	9.3%
15-1152	Computer Network Support Specialists	$66,012	$66,017	0.0%
15-1199	Computer Occupations, All Other	$90,231	$95,927	6.3%
17-1021	Cartographers and Photogrammetrists	$66,245	$65,669	-0.9%
17-2072	Electronics Engineers, Except Computer	$91,021	$100,593	10.5%
17-2199	Engineers, All Other	$91,895	$91,519	-0.4%
17-3011	Architectural and Civil Drafters	$44,285	$63,710	43.9%
17-3019	Drafters, All Other	$67,225	$51,439	-23.5%
17-3023	Electrical and Electronics Engineering Technicians	$61,123	$69,232	13.3%
17-3024	Electro-Mechanical Technicians	$60,588	$55,658	-8.1%
17-3026	Industrial Engineering Technicians	$51,789	$47,934	-7.4%
17-3029	Engineering Technicians, Except Drafters, All Other	$61,635	$63,041	2.3%
19-4092	Forensic Science Technicians	$86,246	$93,974	9.0%
21-1093	Social and Human Service Assistants	$30,364	$30,397	0.1%
21-1094	Community Health Workers	$36,208	$44,934	24.1%
21-1099	Community and Social Service Specialists, All Other	$38,762	$38,020	-1.9%
23-2011	Paralegals and Legal Assistants	$50,684	$58,347	15.1%
23-2093	Title Examiners, Abstractors, and Searchers	$40,073	$54,830	36.8%
23-2099	Legal Support Workers, All Other	$54,973	$61,700	12.2%
25-1099	Postsecondary Teachers	$55,741	$64,937	16.5%
25-2012	Kindergarten Teachers, Except Special Education	$49,929	$58,790	17.7%
25-2021	Elementary School Teachers, Except Special Education	$59,586	$67,884	13.9%
25-2022	Middle School Teachers, Except Special and Career/Technical Education	$67,019	$67,168	0.2%
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	$75,914	$80,135	5.6%
25-3011	Adult Basic and Secondary Education and Literacy Teachers and Instructors	$68,436	$63,135	-7.7%
25-9041	Teacher Assistants	$27,881	$28,025	0.5%
27-1011	Art Directors	$77,569	$96,455	24.3%
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	$57,661	$48,276	-16.3%
27-1014	Multimedia Artists and Animators	$68,909	$60,678	-11.9%
27-1019	Artists and Related Workers, All Other	$50,567	$57,204	13.1%
27-1022	Fashion Designers	$114,940	$83,525	-27.3%
27-1024	Graphic Designers	$51,779	$60,095	16.1%
27-1025	Interior Designers	$47,693	$52,485	10.0%
27-2042	Musicians and Singers	$40,669	$56,603	39.2%
27-3091	Interpreters and Translators	$41,018	$48,369	17.9%
27-4021	Photographers	$34,733	$35,646	2.6%
29-1124	Radiation Therapists	$87,040	$82,441	-5.3%
29-1141	Registered Nurses	$72,513	$76,124	5.0%
29-2021	Dental Hygienists	$74,781	$78,705	5.2%
29-2031	Cardiovascular Technologists and Technicians	$54,645	$62,535	14.4%
29-2032	Diagnostic Medical Sonographers	$77,476	$81,346	5.0%
29-2034	Radiologic Technologists	$63,109	$69,106	9.5%
29-2035	Magnetic Resonance Imaging Technologists	$77,835	$78,511	0.9%
29-2041	Emergency Medical Technicians and Paramedics	$56,239	$40,473	-28.0%
29-2051	Dietetic Technicians	$22,761	$26,622	17.0%
29-2061	Licensed Practical and Licensed Vocational Nurses	$48,325	$56,825	17.6%
29-2071	Medical Records and Health Information Technicians	$38,165	$45,970	20.4%
31-1014	Nursing Assistants	$24,622	$29,645	20.4%

31-2011	Occupational Therapy Assistants	$61,318	$67,104	9.4%
31-9011	Massage Therapists	$27,412	$46,225	68.6%
31-9092	Medical Assistants	$30,925	$34,948	13.0%
31-9097	Phlebotomists	$34,250	$35,628	4.0%
33-1012	First-Line Supervisors of Police and Detectives	$113,848	$120,437	5.8%
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	$106,465	$106,782	0.3%
33-2011	Firefighters	$61,974	$63,492	2.5%
33-2021	Fire Inspectors and Investigators	$64,912	$64,902	0.0%
33-2022	Forest Fire Inspectors and Prevention Specialists	$51,204	$42,768	-16.5%
33-3011	Bailiffs	$30,996	$71,862	131.8%
33-3021	Detectives and Criminal Investigators	$95,001	$88,163	-7.2%
33-3051	Police and Sheriff's Patrol Officers	$79,801	$90,471	13.4%
33-3052	Transit and Railroad Police	$61,879	$38,631	-37.6%
33-9021	Private Detectives and Investigators	$32,217	$59,843	85.8%
33-9032	Security Guards	$26,921	$29,147	8.3%
35-1011	Chefs and Head Cooks	$43,954	$52,533	19.5%
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	$28,822	$30,746	6.7%
35-2013	Cooks, Private Household	$25,178	$41,221	63.7%
35-2014	Cooks, Restaurant	$23,702	$30,533	28.8%
35-2019	Cooks, All Other	$26,178	$30,427	16.2%
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	$39,698	$47,709	20.2%
39-9011	Childcare Workers	$24,043	$23,439	-2.5%
41-1011	First-Line Supervisors of Retail Sales Workers	$38,965	$38,782	-0.5%
41-1012	First-Line Supervisors of Non-Retail Sales Workers	$68,304	$72,242	5.8%
41-2022	Parts Salespersons	$31,445	$32,127	2.2%
41-3011	Advertising Sales Agents	$52,662	$54,306	3.1%
41-3021	Insurance Sales Agents	$52,216	$57,620	10.4%
41-3041	Travel Agents	$31,160	$39,902	28.1%
41-3099	Sales Representatives, Services, All Other	$58,331	$54,005	-7.4%
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	$68,237	$84,939	24.5%
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	$61,548	$60,524	-1.7%
41-9099	Sales and Related Workers, All Other	$31,925	$29,723	-6.9%
43-3011	Bill and Account Collectors	$37,880	$40,286	6.4%
43-3031	Bookkeeping, Accounting, and Auditing Clerks	$40,393	$45,320	12.2%
43-3051	Payroll and Timekeeping Clerks	$45,217	$50,176	11.0%
43-3061	Procurement Clerks	$42,634	$46,251	8.5%
43-3071	Tellers	$27,690	$33,394	20.6%
43-4011	Brokerage Clerks	$47,893	$55,582	16.1%
43-4041	Credit Authorizers, Checkers, and Clerks	$39,948	$46,730	17.0%
43-4131	Loan Interviewers and Clerks	$44,552	$47,017	5.5%
43-4141	New Accounts Clerks	$38,676	$39,772	2.8%
43-5011	Cargo and Freight Agents	$45,412	$45,437	0.1%
43-5031	Police, Fire, and Ambulance Dispatchers	$52,232	$56,280	7.7%
43-5061	Production, Planning, and Expediting Clerks	$48,035	$48,262	0.5%
43-6011	Executive Secretaries and Executive Administrative Assistants	$53,259	$60,833	14.2%
43-6013	Medical Secretaries	$34,308	$36,004	4.9%
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	$35,750	$38,884	8.8%

43-9021	Data Entry Keyers	$28,779	$35,974	25.0%
43-9022	Word Processors and Typists	$36,845	$52,656	42.9%
43-9031	Desktop Publishers	$48,283	$35,272	-26.9%
43-9041	Insurance Claims and Policy Processing Clerks	$39,144	$44,824	14.5%
43-9061	Office Clerks, General	$31,375	$36,805	17.3%
43-9111	Statistical Assistants	$56,192	$53,408	-5.0%
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	$82,952	$89,490	7.9%
49-2092	Electric Motor, Power Tool, and Related Repairers	$47,133	$85,696	81.8%
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	$52,615	$57,524	9.3%
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	$58,010	$61,065	5.3%
49-9071	Maintenance and Repair Workers, General	$42,278	$44,504	5.3%
49-9098	Helpers--Installation, Maintenance, and Repair Workers	$23,761	$30,650	29.0%
49-9099	Installation, Maintenance, and Repair Workers, All Other	$51,859	$48,034	-7.4%
51-3011	Bakers	$24,213	$24,318	0.4%
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	$37,428	$39,181	4.7%
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	$47,690	$53,516	12.2%
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	$29,875	$29,554	-1.1%
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	$35,981	$41,308	14.8%
51-4121	Welders, Cutters, Solderers, and Brazers	$35,634	$41,936	17.7%
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	$30,109	$32,274	7.2%
51-5111	Prepress Technicians and Workers	$42,101	$50,981	21.1%
51-5112	Printing Press Operators	$40,650	$42,315	4.1%
51-6092	Fabric and Apparel Patternmakers	$24,509	$41,651	69.9%
51-9141	Semiconductor Processors	$24,338	$17,563	-27.8%
51-9198	Helpers--Production Workers	$24,278	$27,099	11.6%
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	$20,652	$21,047	1.9%

Appendix I – Employment Distribution by Age Group Mapped to Harper Programs

SOC	Description	Total (2019)	< Age 25	Age 25-34	Age 35-44	Age 45-54	Age 55+
11-1011	Chief Executives	5,199	0.4%	6.5%	20.3%	30.2%	42.6%
11-1021	General and Operations Managers	65,573	1.7%	18.8%	28.1%	27.8%	23.7%
11-2022	Sales Managers	13,908	3.8%	25.8%	28.3%	24.2%	17.9%
11-3011	Administrative Services Managers	9,898	2.1%	12.4%	21.5%	30.4%	33.6%
11-3021	Computer and Information Systems Managers	10,577	1.6%	19.1%	33.2%	28.9%	17.2%
11-3051	Industrial Production Managers	4,967	0.9%	11.5%	24.3%	32.3%	31.0%
11-3061	Purchasing Managers	2,344	1.7%	15.5%	23.1%	28.5%	31.2%
11-3071	Transportation, Storage, and Distribution Managers	4,746	3.6%	20.3%	25.2%	26.5%	24.4%
11-3111	Compensation and Benefits Managers	616	1.5%	17.9%	28.0%	26.7%	26.1%
11-3121	Human Resources Managers	5,869	2.6%	19.3%	28.1%	25.8%	24.2%
11-3131	Training and Development Managers	1,570	5.2%	23.9%	27.1%	23.0%	20.7%
11-9021	Construction Managers	6,568	1.7%	14.2%	25.5%	29.7%	28.9%
11-9041	Architectural and Engineering Managers	4,978	0.3%	10.2%	25.1%	33.2%	31.2%
11-9051	Food Service Managers	10,040	8.2%	25.3%	23.9%	21.5%	21.0%
11-9081	Lodging Managers	620	3.6%	24.6%	24.2%	24.6%	23.0%
11-9111	Medical and Health Services Managers	7,374	1.1%	14.9%	24.6%	27.4%	32.1%
11-9121	Natural Sciences Managers	1,100	3.1%	20.6%	26.2%	27.6%	22.5%
11-9151	Social and Community Service Managers	2,730	2.2%	17.3%	21.2%	24.6%	34.5%
11-9161	Emergency Management Directors	200	4.5%	24.9%	20.0%	24.8%	26.0%
11-9199	Managers, All Other	27,864	2.3%	17.8%	25.7%	27.1%	27.1%
13-1011	Agents and Business Managers of Artists, Performers, and Athletes	211	13.1%	40.7%	23.9%	14.4%	8.3%
13-1028	Buyers and Purchasing Agents	7,191	4.0%	20.3%	20.6%	25.0%	30.1%
13-1031	Claims Adjusters, Examiners, and Investigators	7,227	3.2%	23.5%	26.1%	25.0%	22.3%
13-1032	Insurance Appraisers, Auto Damage	192	6.8%	22.9%	26.5%	25.9%	18.3%
13-1051	Cost Estimators	2,590	2.8%	14.6%	18.9%	25.0%	38.7%
13-1071	Human Resources Specialists	13,834	6.1%	30.7%	25.2%	19.8%	18.2%
13-1075	Labor Relations Specialists	2,555	3.9%	21.0%	23.4%	25.6%	26.2%
13-1111	Management Analysts	24,815	4.1%	26.9%	25.1%	21.5%	22.3%
13-1141	Compensation, Benefits, and Job Analysis Specialists	2,095	4.8%	26.4%	24.3%	23.2%	21.3%
13-1151	Training and Development Specialists	5,438	4.8%	25.5%	26.0%	22.0%	21.7%
13-2011	Accountants and Auditors	32,780	6.5%	28.3%	23.1%	20.8%	21.3%
13-2031	Budget Analysts	817	3.1%	24.2%	24.8%	24.7%	23.3%
13-2041	Credit Analysts	2,194	6.1%	33.6%	25.9%	19.7%	14.8%
13-2053	Insurance Underwriters	3,332	3.0%	22.0%	25.8%	26.4%	22.7%
13-2061	Financial Examiners	1,280	3.7%	24.5%	21.4%	27.9%	22.5%
13-2071	Credit Counselors	681	5.7%	29.7%	26.7%	20.7%	17.2%
13-2081	Tax Examiners and Collectors, and Revenue Agents	563	1.4%	13.6%	21.2%	23.7%	40.0%
13-2082	Tax Preparers	2,224	8.9%	24.8%	17.8%	14.9%	33.6%
15-1111	Computer and Information Research Scientists	136	8.1%	31.1%	24.4%	21.7%	15.0%
15-1122	Information Security Analysts	2,135	4.5%	27.8%	30.1%	21.3%	16.3%
15-1131	Computer Programmers	5,540	5.5%	28.6%	27.5%	22.8%	15.7%
15-1132	Software Developers, Applications	17,921	4.6%	35.8%	29.9%	19.0%	10.7%
15-1133	Software Developers, Systems Software	9,731	4.4%	34.1%	29.7%	19.9%	11.9%

15-1134	Web Developers	3,148	9.2%	43.4%	28.1%	12.9%	6.3%
15-1152	Computer Network Support Specialists	5,672	7.9%	30.9%	26.2%	20.6%	14.4%
15-1199	Computer Occupations, All Other	9,477	5.9%	29.1%	29.0%	21.8%	14.3%
17-1021	Cartographers and Photogrammetrists	99	13.2%	30.1%	22.5%	19.0%	15.2%
17-2072	Electronics Engineers, Except Computer	1,477	2.5%	19.5%	22.8%	27.5%	27.7%
17-2199	Engineers, All Other	1,906	4.2%	23.7%	21.5%	23.2%	27.4%
17-3011	Architectural and Civil Drafters	1,269	9.1%	28.7%	21.9%	19.2%	21.1%
17-3019	Drafters, All Other	1,632	6.3%	18.0%	20.3%	25.9%	29.5%
17-3023	Electrical and Electronics Engineering Technicians	1,632	6.3%	18.0%	20.3%	25.9%	29.5%
17-3024	Electro-Mechanical Technicians	124	12.1%	16.8%	20.0%	26.6%	24.9%
17-3026	Industrial Engineering Technicians	740	4.7%	16.1%	19.9%	27.8%	31.5%
17-3029	Engineering Technicians, Except Drafters, All Other	2,447	7.1%	19.5%	20.8%	25.0%	27.6%
19-4092	Forensic Science Technicians	233	18.8%	25.6%	18.9%	16.5%	20.5%
21-1093	Social and Human Service Assistants	7,710	6.5%	24.7%	22.4%	21.3%	25.0%
21-1094	Community Health Workers	545	6.6%	25.0%	22.7%	19.9%	25.8%
21-1099	Community and Social Service Specialists, All Other	1,712	6.6%	24.3%	22.6%	20.6%	26.0%
23-2011	Paralegals and Legal Assistants	9,820	7.3%	29.0%	22.8%	20.5%	20.5%
23-2093	Title Examiners, Abstractors, and Searchers	565	6.4%	26.9%	22.0%	22.3%	22.3%
23-2099	Legal Support Workers, All Other	530	7.0%	29.5%	21.0%	20.0%	22.5%
25-1099	Postsecondary Teachers	32,036	6.6%	21.3%	22.0%	17.7%	32.5%
25-2012	Kindergarten Teachers, Except Special Education	2,113	6.5%	29.4%	27.1%	20.3%	16.7%
25-2021	Elementary School Teachers, Except Special Education	28,964	3.2%	24.9%	27.5%	22.2%	22.2%
25-2022	Middle School Teachers, Except Special and Career/Technical Education	10,464	3.3%	24.9%	27.5%	22.1%	22.2%
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	19,787	4.1%	26.0%	26.1%	21.5%	22.3%
25-3011	Adult Basic and Secondary Education and Literacy Teachers and Instructors	855	24.5%	21.5%	17.4%	14.6%	22.0%
25-9041	Teacher Assistants	29,067	9.1%	17.7%	23.4%	25.3%	24.5%
27-1011	Art Directors	1,407	6.0%	35.0%	26.5%	18.2%	14.3%
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	79	11.4%	28.5%	24.6%	19.8%	15.5%
27-1014	Multimedia Artists and Animators	504	7.9%	35.4%	26.2%	16.9%	13.5%
27-1019	Artists and Related Workers, All Other	55	23.5%	32.5%	23.5%	19.9%	0.0%
27-1022	Fashion Designers	87	12.6%	33.8%	22.4%	17.6%	13.2%
27-1024	Graphic Designers	6,796	8.0%	34.1%	23.2%	18.0%	16.7%
27-1025	Interior Designers	1,394	6.6%	31.8%	22.8%	18.8%	20.0%
27-2042	Musicians and Singers	2,181	7.9%	18.7%	13.6%	15.0%	44.9%
27-3091	Interpreters and Translators	1,227	12.8%	29.5%	22.8%	16.9%	17.9%
27-4021	Photographers	1,403	15.2%	31.5%	22.1%	16.7%	14.5%
29-1124	Radiation Therapists	284	6.0%	31.1%	25.5%	24.2%	13.1%
29-1141	Registered Nurses	70,156	2.7%	23.0%	23.5%	23.0%	27.8%
29-2021	Dental Hygienists	4,515	4.4%	26.5%	25.2%	22.9%	21.0%
29-2031	Cardiovascular Technologists and Technicians	1,460	4.2%	29.9%	25.1%	20.8%	20.0%
29-2032	Diagnostic Medical Sonographers	1,583	4.2%	29.3%	25.3%	21.0%	20.2%
29-2034	Radiologic Technologists	4,073	4.3%	29.5%	25.1%	20.9%	20.3%
29-2035	Magnetic Resonance Imaging Technologists	1,107	4.3%	29.3%	25.1%	21.1%	20.1%
29-2041	Emergency Medical Technicians and Paramedics	3,317	14.6%	37.5%	25.7%	13.9%	8.3%
29-2051	Dietetic Technicians	1,731	11.6%	34.6%	21.1%	16.5%	16.2%

29-2061	Licensed Practical and Licensed Vocational Nurses	8,758	5.0%	21.8%	23.5%	22.6%	27.1%
29-2071	Medical Records and Health Information Technicians	4,062	6.4%	21.7%	21.6%	22.1%	28.1%
31-1014	Nursing Assistants	28,063	11.5%	25.1%	21.8%	20.1%	21.6%
31-2011	Occupational Therapy Assistants	879	4.0%	31.7%	29.3%	20.9%	14.0%
31-9011	Massage Therapists	2,848	10.4%	34.5%	22.6%	17.9%	14.6%
31-9092	Medical Assistants	11,865	12.7%	37.1%	23.0%	15.0%	12.1%
31-9097	Phlebotomists	2,434	10.2%	33.0%	24.0%	17.6%	15.2%
33-1012	First-Line Supervisors of Police and Detectives	3,350	0.8%	9.0%	33.5%	38.0%	18.7%
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	2,036	0.5%	6.2%	29.5%	41.7%	22.1%
33-2011	Firefighters	9,218	6.5%	31.4%	32.5%	21.5%	8.1%
33-2021	Fire Inspectors and Investigators	141	3.5%	13.4%	22.6%	31.1%	29.0%
33-2022	Forest Fire Inspectors and Prevention Specialists	21	n/a	n/a	n/a	n/a	n/a
33-3011	Bailiffs	845	7.9%	26.3%	27.1%	21.9%	16.7%
33-3021	Detectives and Criminal Investigators	1,871	1.2%	19.4%	38.6%	25.4%	15.4%
33-3051	Police and Sheriff's Patrol Officers	17,997	6.2%	30.5%	32.8%	20.0%	10.5%
33-3052	Transit and Railroad Police	55	0.0%	24.4%	36.7%	19.9%	0.0%
33-9021	Private Detectives and Investigators	532	5.0%	26.2%	25.4%	22.3%	21.2%
33-9032	Security Guards	33,853	12.2%	23.4%	17.3%	17.8%	29.3%
35-1011	Chefs and Head Cooks	2,924	6.6%	25.4%	26.1%	23.9%	18.0%
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	13,562	15.3%	28.0%	21.5%	18.0%	17.2%
35-2013	Cooks, Private Household	31	n/a	n/a	n/a	n/a	n/a
35-2014	Cooks, Restaurant	25,453	21.5%	25.8%	21.0%	16.3%	15.4%
35-2019	Cooks, All Other	1,278	14.3%	21.7%	20.7%	21.2%	22.1%
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	2,393	2.4%	14.3%	23.9%	28.8%	30.6%
39-9011	Childcare Workers	12,225	23.7%	23.1%	15.8%	15.6%	21.9%
41-1011	First-Line Supervisors of Retail Sales Workers	17,607	9.5%	27.4%	23.5%	20.9%	18.7%
41-1012	First-Line Supervisors of Non-Retail Sales Workers	3,438	3.3%	19.6%	28.1%	25.9%	23.2%
41-2022	Parts Salespersons	3,760	13.9%	22.2%	17.9%	19.8%	26.1%
41-3011	Advertising Sales Agents	5,737	9.0%	33.4%	23.0%	18.6%	16.0%
41-3021	Insurance Sales Agents	15,438	4.4%	21.3%	23.0%	24.1%	27.1%
41-3041	Travel Agents	2,404	3.6%	19.8%	21.0%	24.4%	31.1%
41-3099	Sales Representatives, Services, All Other	28,721	8.2%	27.8%	23.4%	21.0%	19.7%
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	7,488	3.0%	20.0%	25.1%	26.7%	25.2%
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	33,264	3.5%	18.7%	22.7%	25.2%	30.0%
41-9099	Sales and Related Workers, All Other	1,167	8.5%	20.6%	19.4%	19.2%	32.4%
43-3011	Bill and Account Collectors	5,541	9.3%	29.2%	23.7%	19.7%	18.2%
43-3031	Bookkeeping, Accounting, and Auditing Clerks	25,939	4.8%	16.0%	20.1%	24.2%	34.9%
43-3051	Payroll and Timekeeping Clerks	2,256	4.4%	20.1%	22.9%	24.4%	28.2%
43-3061	Procurement Clerks	1,333	3.7%	17.4%	21.5%	28.0%	29.4%
43-3071	Tellers	8,136	20.6%	26.4%	16.6%	16.5%	20.0%
43-4011	Brokerage Clerks	2,096	9.1%	27.0%	24.2%	22.3%	17.3%
43-4041	Credit Authorizers, Checkers, and Clerks	247	13.3%	25.9%	21.0%	23.0%	16.6%
43-4131	Loan Interviewers and Clerks	4,737	7.7%	27.4%	27.0%	22.4%	15.6%

43-4141	New Accounts Clerks	1,581	7.4%	30.8%	23.7%	21.8%	16.3%
43-5011	Cargo and Freight Agents	2,587	12.4%	31.4%	21.4%	18.4%	16.4%
43-5031	Police, Fire, and Ambulance Dispatchers	1,559	9.2%	25.5%	25.0%	21.8%	18.5%
43-5061	Production, Planning, and Expediting Clerks	7,503	6.6%	22.7%	21.3%	24.1%	25.3%
43-6011	Executive Secretaries and Executive Administrative Assistants	16,134	6.6%	17.3%	19.5%	23.6%	32.9%
43-6013	Medical Secretaries	7,858	6.1%	17.9%	19.5%	22.8%	33.7%
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	38,154	6.7%	16.9%	19.6%	23.4%	33.4%
43-9021	Data Entry Keyers	4,305	13.5%	25.7%	19.7%	19.2%	21.9%
43-9022	Word Processors and Typists	298	17.5%	22.1%	18.2%	17.6%	24.4%
43-9031	Desktop Publishers	443	7.9%	26.3%	20.5%	22.0%	23.5%
43-9041	Insurance Claims and Policy Processing Clerks	5,482	7.0%	25.1%	23.0%	22.4%	22.5%
43-9061	Office Clerks, General	89,121	13.6%	20.0%	18.6%	19.9%	27.9%
43-9111	Statistical Assistants	325	12.1%	24.6%	20.4%	21.4%	21.5%
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	4,748	2.1%	13.7%	25.6%	30.9%	27.7%
49-2092	Electric Motor, Power Tool, and Related Repairers	383	10.6%	20.1%	17.6%	23.5%	28.2%
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	1,024	12.7%	24.6%	18.6%	21.6%	22.5%
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3,768	7.2%	22.3%	27.1%	25.4%	18.1%
49-9071	Maintenance and Repair Workers, General	33,356	4.3%	16.0%	20.8%	27.9%	31.0%
49-9098	Helpers--Installation, Maintenance, and Repair Workers	1,091	22.6%	25.6%	19.0%	17.1%	15.8%
49-9099	Installation, Maintenance, and Repair Workers, All Other	4,164	10.2%	22.8%	21.0%	22.2%	23.9%
51-3011	Bakers	5,278	13.0%	21.5%	19.9%	21.1%	24.5%
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	2,465	5.1%	19.6%	22.6%	26.2%	26.5%
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	429	5.4%	19.8%	22.8%	26.1%	25.9%
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	346	5.8%	21.1%	26.0%	24.0%	23.1%
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	450	5.6%	17.1%	18.9%	24.7%	33.8%
51-4121	Welders, Cutters, Solderers, and Brazers	4,203	7.7%	22.5%	23.7%	23.4%	22.7%
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	562	7.2%	21.8%	23.2%	23.5%	24.3%
51-5111	Prepress Technicians and Workers	514	6.0%	15.6%	20.4%	28.4%	29.6%
51-5112	Printing Press Operators	4,567	5.0%	16.4%	22.1%	29.3%	27.2%
51-6092	Fabric and Apparel Patternmakers	92	14.1%	19.5%	18.4%	23.8%	23.8%
51-9141	Semiconductor Processors	84	15.4%	20.4%	20.5%	23.7%	19.8%
51-9198	Helpers--Production Workers	6,769	16.7%	21.4%	19.9%	17.2%	24.8%
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	215	7.4%	17.2%	31.2%	14.0%	30.3%

Source: EMSI, 2019.

Appendix J – Automation Potential Mapping to Harper Programs

Legend	
Less than 25% (Low)	
25% to 49% (Low-Moderate)	
50% to 74% (High-Moderate)	
75% or More (High)	

SOC	Description	2019 Jobs	Median Annual Earnings (2018)	Automation Potential
11-1011	Chief Executives	5,199	$235,154	1.5%
11-1021	General and Operations Managers	65,573	$113,746	16.0%
11-2022	Sales Managers	13,908	$122,920	1.3%
11-3011	Administrative Services Managers	9,898	$95,098	73.0%
11-3021	Computer and Information Systems Managers	10,577	$143,196	3.5%
11-3051	Industrial Production Managers	4,967	$101,519	3.0%
11-3061	Purchasing Managers	2,344	$109,573	3.0%
11-3071	Transportation, Storage, and Distribution Managers	4,746	$94,159	59.0%
11-3111	Compensation and Benefits Managers	616	$119,651	96.0%
11-3121	Human Resources Managers	5,869	$113,376	0.6%
11-3131	Training and Development Managers	1,570	$116,865	0.6%
11-9021	Construction Managers	6,568	$94,589	7.1%
11-9041	Architectural and Engineering Managers	4,978	$132,278	1.7%
11-9051	Food Service Managers	10,040	$53,554	8.3%
11-9081	Lodging Managers	620	$41,584	0.4%
11-9111	Medical and Health Services Managers	7,374	$110,181	0.7%
11-9121	Natural Sciences Managers	1,100	$118,787	1.8%
11-9151	Social and Community Service Managers	2,730	$65,265	0.7%
11-9161	Emergency Management Directors	200	$81,500	0.3%
11-9199	Managers, All Other	27,864	$86,769	25.0%
13-1011	Agents and Business Managers of Artists, Performers, and Athletes	211	$48,659	24.0%
13-1028	Buyers and Purchasing Agents	7,191	$64,271	87.0%
13-1031	Claims Adjusters, Examiners, and Investigators	7,227	$67,599	98.0%
13-1032	Insurance Appraisers, Auto Damage	192	$65,482	98.0%
13-1051	Cost Estimators	2,590	$65,340	57.0%
13-1071	Human Resources Specialists	13,834	$59,288	31.0%
13-1075	Labor Relations Specialists	2,555	$63,657	31.0%
13-1111	Management Analysts	24,815	$88,662	13.0%
13-1141	Compensation, Benefits, and Job Analysis Specialists	2,095	$65,748	47.0%
13-1151	Training and Development Specialists	5,438	$66,779	1.4%
13-2011	Accountants and Auditors	32,780	$76,958	94.0%
13-2031	Budget Analysts	817	$75,071	94.0%
13-2041	Credit Analysts	2,194	$71,441	98.0%
13-2053	Insurance Underwriters	3,332	$76,024	99.0%
13-2061	Financial Examiners	1,280	$100,845	17.0%
13-2071	Credit Counselors	681	$43,588	4.0%
13-2081	Tax Examiners and Collectors, and Revenue Agents	563	$87,149	93.0%
13-2082	Tax Preparers	2,224	$29,465	99.0%
15-1111	Computer and Information Research Scientists	136	$115,491	1.5%
15-1122	Information Security Analysts	2,135	$101,652	21.0%

15-1131	Computer Programmers	5,540	$91,302	48.0%
15-1132	Software Developers, Applications	17,921	$100,008	4.2%
15-1133	Software Developers, Systems Software	9,731	$112,582	13.0%
15-1134	Web Developers	3,148	$74,891	21.0%
15-1152	Computer Network Support Specialists	5,672	$66,017	65.0%
15-1199	Computer Occupations, All Other	9,477	$95,927	22.0%
17-1021	Cartographers and Photogrammetrists	99	$65,669	88.0%
17-2072	Electronics Engineers, Except Computer	1,477	$100,593	2.5%
17-2199	Engineers, All Other	1,906	$91,519	1.4%
17-3011	Architectural and Civil Drafters	1,269	$63,710	52.0%
17-3019	Drafters, All Other	150	$51,439	67.0%
17-3023	Electrical and Electronics Engineering Technicians	1,632	$69,232	84.0%
17-3024	Electro-Mechanical Technicians	124	$55,658	81.0%
17-3026	Industrial Engineering Technicians	740	$47,934	3.0%
17-3029	Engineering Technicians, Except Drafters, All Other	2,447	$63,041	24.0%
19-4092	Forensic Science Technicians	233	$93,974	1.0%
21-1093	Social and Human Service Assistants	7,710	$30,397	13.0%
21-1094	Community Health Workers	545	$44,934	0.4%
21-1099	Community and Social Service Specialists, All Other	1,712	$38,020	13.0%
23-2011	Paralegals and Legal Assistants	9,820	$58,347	94.0%
23-2093	Title Examiners, Abstractors, and Searchers	565	$54,830	99.0%
23-2099	Legal Support Workers, All Other	530	$61,700	58.0%
25-1099	Postsecondary Teachers	32,036	$64,937	3.2%
25-2012	Kindergarten Teachers, Except Special Education	2,113	$58,790	15.0%
25-2021	Elementary School Teachers, Except Special Education	28,964	$67,884	0.4%
25-2022	Middle School Teachers, Except Special and Career/Technical Education	10,464	$67,168	17.0%
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	19,787	$80,135	0.8%
25-3011	Adult Basic and Secondary Education and Literacy Teachers and Instructors	855	$63,135	19.0%
25-9041	Teacher Assistants	29,067	$28,025	56.0%
27-1011	Art Directors	1,407	$96,455	2.3%
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	79	$48,276	4.2%
27-1014	Multimedia Artists and Animators	504	$60,678	1.5%
27-1019	Artists and Related Workers, All Other	55	$57,204	n/a
27-1022	Fashion Designers	87	$83,525	2.1%
27-1024	Graphic Designers	6,796	$60,095	8.2%
27-1025	Interior Designers	1,394	$52,485	2.2%
27-2042	Musicians and Singers	2,181	$56,603	7.4%
27-3091	Interpreters and Translators	1,227	$48,369	38.0%
27-4021	Photographers	1,403	$35,646	2.1%
29-1124	Radiation Therapists	284	$82,441	34.0%
29-1141	Registered Nurses	70,156	$76,124	0.9%
29-2021	Dental Hygienists	4,515	$78,705	68.0%
29-2031	Cardiovascular Technologists and Technicians	1,460	$62,535	23.0%
29-2032	Diagnostic Medical Sonographers	1,583	$81,346	35.0%
29-2034	Radiologic Technologists	4,073	$69,106	23.0%
29-2035	Magnetic Resonance Imaging Technologists	1,107	$78,511	23.0%
29-2041	Emergency Medical Technicians and Paramedics	3,317	$40,473	4.9%
29-2051	Dietetic Technicians	1,731	$26,622	13.0%
29-2061	Licensed Practical and Licensed Vocational Nurses	8,758	$56,825	5.8%

29-2071	Medical Records and Health Information Technicians	4,062	$45,970	91.0%
31-1014	Nursing Assistants	28,063	$29,645	5.5%
31-2011	Occupational Therapy Assistants	879	$67,104	2.8%
31-9011	Massage Therapists	2,848	$46,225	54.0%
31-9092	Medical Assistants	11,865	$34,948	30.0%
31-9097	Phlebotomists	2,434	$35,628	63.0%
33-1012	First-Line Supervisors of Police and Detectives	3,350	$120,437	0.4%
33-1021	First-Line Supervisors of Fire Fighting and Prevention Workers	141	$64,902	0.4%
33-2011	Firefighters	9,218	$63,492	17.0%
33-2021	Fire Inspectors and Investigators	141	$64,902	48.0%
33-2022	Forest Fire Inspectors and Prevention Specialists	21	$42,768	4.8%
33-3011	Bailiffs	845	$71,862	36.0%
33-3021	Detectives and Criminal Investigators	1,871	$88,163	34.0%
33-3051	Police and Sheriff's Patrol Officers	17,997	$90,471	9.8%
33-3052	Transit and Railroad Police	55	$38,631	57.0%
33-9021	Private Detectives and Investigators	532	$59,843	31.0%
33-9032	Security Guards	33,853	$29,147	84.0%
35-1011	Chefs and Head Cooks	2,924	$52,533	10.0%
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	13,562	$30,746	63.0%
35-2013	Cooks, Private Household	31	$41,221	30.0%
35-2014	Cooks, Restaurant	25,453	$30,533	96.0%
35-2019	Cooks, All Other	1,278	$30,427	94.0%
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	2,393	$47,709	94.0%
39-9011	Childcare Workers	12,225	$23,439	8.4%
41-1011	First-Line Supervisors of Retail Sales Workers	17,607	$38,782	28.0%
41-1012	First-Line Supervisors of Non-Retail Sales Workers	3,438	$72,242	7.5%
41-2022	Parts Salespersons	3,760	$32,127	98.0%
41-3011	Advertising Sales Agents	5,737	$54,306	54.0%
41-3021	Insurance Sales Agents	15,438	$57,620	92.0%
41-3041	Travel Agents	2,404	$39,902	9.9%
41-3099	Sales Representatives, Services, All Other	28,721	$54,005	n/a
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	7,488	$84,939	25.0%
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	33,264	$60,524	85.0%
41-9099	Sales and Related Workers, All Other	1,167	$29,723	95.0%
43-3011	Bill and Account Collectors	5,541	$40,286	95.0%
43-3031	Bookkeeping, Accounting, and Auditing Clerks	25,939	$45,320	98.0%
43-3051	Payroll and Timekeeping Clerks	2,256	$50,176	97.0%
43-3061	Procurement Clerks	1,333	$46,251	98.0%
43-3071	Tellers	8,136	$33,394	98.0%
43-4011	Brokerage Clerks	2,096	$55,582	98.0%
43-4041	Credit Authorizers, Checkers, and Clerks	247	$46,730	97.0%
43-4131	Loan Interviewers and Clerks	4,737	$47,017	92.0%
43-4141	New Accounts Clerks	1,581	$39,772	99.0%
43-5011	Cargo and Freight Agents	2,587	$45,437	99.0%
43-5031	Police, Fire, and Ambulance Dispatchers	1,559	$56,280	49.0%
43-5061	Production, Planning, and Expediting Clerks	7,503	$48,262	88.0%
43-6011	Executive Secretaries and Executive Administrative Assistants	16,134	$60,833	86.0%
43-6013	Medical Secretaries	7,858	$36,004	81.0%

43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	38,154	$38,884	96.0%
43-9021	Data Entry Keyers	4,305	$35,974	99.0%
43-9022	Word Processors and Typists	298	$52,656	81.0%
43-9031	Desktop Publishers	443	$35,272	16.0%
43-9041	Insurance Claims and Policy Processing Clerks	5,482	$44,824	98.0%
43-9061	Office Clerks, General	89,121	$36,805	96.0%
43-9111	Statistical Assistants	325	$53,408	66.0%
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	4,748	$89,490	17.0%
49-2092	Electric Motor, Power Tool, and Related Repairers	383	$85,696	76.0%
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	1,024	$57,524	41.0%
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3,768	$61,065	65.0%
49-9071	Maintenance and Repair Workers, General	33,356	$44,504	64.0%
49-9098	Helpers--Installation, Maintenance, and Repair Workers	1,091	$30,650	79.0%
49-9099	Installation, Maintenance, and Repair Workers, All Other	4,164	$48,034	50.0%
51-3011	Bakers	5,278	$24,318	89.0%
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	2,465	$39,181	86.0%
51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	429	$53,516	36.0%
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	346	$29,554	91.0%
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	450	$41,308	93.0%
51-4121	Welders, Cutters, Solderers, and Brazers	4,203	$41,936	94.0%
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	562	$32,274	61.0%
51-5111	Prepress Technicians and Workers	514	$50,981	97.0%
51-5112	Printing Press Operators	4,567	$42,315	83.0%
51-6092	Fabric and Apparel Patternmakers	92	$41,651	0.5%
51-9141	Semiconductor Processors	84	$17,563	88.0%
51-9198	Helpers--Production Workers	27,099	$27,099	66.0%
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	215	$21,047	25.0%

Sources: US Bureau of Labor Statistics, 2014; O*Net; McKinsey Global Institute analysis.

Links: "Harnessing automation for a future that works", McKinsey Global Institute, January 2017. [https://www.mckinsey.com/featured-insights/digital-disruption/harnessing-automation-for-a-future-that-works]; "Four fundamentals of workplace automation", McKinsey Digital, November 2015. [https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/four-fundamentals-of-workplace-automation].

Appendix K – Occupations: Automation Index

SOC	Description	Annual Job Openings	Supply/ Demand Gap	Pct. Job Change 2019-2029	Median Annual Wage (2018)	Wage Trend 2014-2018	Pct. of Worker 55 Years & Older	CIP	Description
11-3021	Computer and Information Systems Managers	904	1,738	7.2%	$143,196	14.3%	17.2%	11.0103	Information Technology
11-9013	Farmers, Ranchers, and Other Agricultural Managers	35	(12)	22.8%	$55,178	-9.3%	40.5%	01.0308	Agroecology and Sustainable Agriculture
11-9041	Architectural and Engineering Managers	359	2,709	-2.3%	$132,278	5.3%	31.2%	14.1003	Laser and Optical Engineering
15-1111	Computer and Information Research Scientists	13	2,880	23.0%	$115,491	20.8%	15.0%	11.0102	Artificial Intelligence
15-1121	Computer Systems Analysts	1,123	388	5.7%	$90,591	5.7%	16.0%	11.0103	Information Technology
15-1122	Information Security Analysts	206	3,785	18.1%	$101,652	6.1%	16.3%	11.0103	Information Technology
15-1132	Software Developers, Applications	1,739	827	24.3%	$100,008	10.5%	10.7%	11.0104	Informatics
15-1133	Software Developers, Systems Software	722	2,252	6.4%	$112,582	11.4%	11.9%	11.0104	Informatics
15-1143	Computer Network Architects	245	3,746	3.0%	$123,903	6.6%	11.7%	11.0103	Information Technology
15-1151	Computer User Support Specialists	1,301	1,631	9.8%	$53,182	1.6%	14.1%	01.0106	Agricultural Business Technology
15-1199	Computer Occupations, All Other	864	1,543	7.2%	$95,927	6.3%	14.3%	26.1103	Bioinformatics
17-2072	Electronics Engineers, Except Computer	100	388	-6.0%	$100,593	10.5%	27.7%	14.1004	Telecommunications Engineering
17-2081	Environmental Engineers	53	(40)	9.3%	$96,567	3.6%	18.4%	14.1401	Environmental/Environmental Health Engineering
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	14	(1)	9.0%	$99,001	37.2%	26.3%	14.1401	Environmental/Environmental Health Engineering
17-2199	Engineers, All Other	139	232	1.4%	$91,519	-0.4%	27.4%	14.1003	Laser and Optical Engineering
17-3029	Engineering Technicians, Except Drafters, All Other	229	(119)	-2.8%	$63,041	2.3%	27.6%	15.1103	Hydraulics and Fluid Power Technology/Technician
19-1012	Food Scientists and Technologists	56	0	0.3%	$90,452	51.3%	21.9%	01.0309	Viticulture and Enology
19-1013	Soil and Plant Scientists	13	(11)	14.4%	$52,641	-24.2%	12.6%	01.0309	Viticulture and Enology
19-1031	Conservation Scientists	18	(6)	1.5%	$53,156	-39.5%	21.0%	01.0308	Agroecology and Sustainable Agriculture

SOC Code	Occupation	Jobs	Change	Growth %	Median Earnings	%	%	CIP Code	Program
21-1012	Educational, Guidance, School, and Vocational Counselors	742	(527)	7.7%	$54,748	-12.3%	22.2%	13.1101	Counselor Education/School Counseling and Guidance Services
25-1041	Agricultural Sciences Teachers, Postsecondary	2,832	5,906	10.7%	$64,937	16.5%	32.5%	01.0308	Agroecology and Sustainable Agriculture
25-1043	Forestry and Conservation Science Teachers, Postsecondary	2,832	5,906	10.7%	$64,937	16.5%	32.5%	01.0308	Agroecology and Sustainable Agriculture
25-2059	Special Education Teachers, All Other	44	446	12.2%	$60,541	-4.1%	21.6%	13.1001	Special Education and Teaching, General
43-1011	First-Line Supervisors of Office and Administrative Support Workers	2,228	(2,139)	3.1%	$59,017	7.2%	25.9%	01.0106	Agricultural Business Technology
45-1011	First-Line Supervisors of Farming, Fishing, and Forestry Workers	24	(24)	6.1%	$49,221	-5.7%	30.7%	01.0308	Agroecology and Sustainable Agriculture
45-2011	Agricultural Inspectors	19	(19)	4.6%	$67,871	15.5%	36.2%	01.0401	Agricultural and Food Products Processing
47-2231	Solar Photovoltaic Installers	6	(6)	87.3%	$41,962	12.2%	n/a	15.0505	Solar Energy Technology/Technician
49-3041	Farm Equipment Mechanics and Service Technicians	8	(8)	1.0%	$52,180	23.5%	20.6%	01.0205	Agricultural Mechanics and Equipment/Machine Technology
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	123	(123)	4.1%	$66,633	9.3%	23.9%	01.0205	Agricultural Mechanics and Equipment/Machine Technology
51-8031	Water and Wastewater Treatment Plant and System Operators	122	(122)	-3.9%	$65,954	5.6%	28.4%	15.0506	Water Quality and Wastewater Treatment Management and Recycling Technology/Technician

Sources: CGS analysis of data from EMSI, Inc.; US Bureau of Labor Statistics; O*Net; and the McKinsey Global Institute.