



A Comparative Analysis of Gulf Coast Region 2012-2022 and 2014-2024 Employment Projections

Workforce Solutions is an affiliate of the Gulf Coast Workforce Board, which manages a regional system that helps employers solve their workforce problems and residents build careers so both can compete in the global economy. The workforce system serves the City of Houston and the surrounding 13 Texas Gulf Coast counties including: Austin, Brazoria, Chambers, Colorado, Fort Bend, Galveston, Harris, Liberty, Matagorda, Montgomery, Walker, Waller, and Wharton.

Executive Summary

This report examines changes in industry and occupational growth trends between the 2012-2022 and 2014-2024 Employment Projections as a result of changes in methodology by the Texas Workforce Commission coinciding with a downturn in the Gulf Coast regional economy. The following are the key findings from the analysis:

- Overall projected employment growth for the region was lowered from 23.8 percent to 22.4 percent across projections.
- 124 out of 274 4-digit NAICS industries experienced downward revisions to their projected growth; those related to manufacturing and oil and gas exploration saw the steepest declines.
- 150 industries saw upward revisions to their projected growth; the types of industries varied widely however many were service-sector and/or population driven.
- The number of occupations reported in the Employment Projections fell from 770 to 669 as a result of changes in estimation methodology; a consequence of this change was a larger number of jobs that could not be tied to a specific occupation.
- 7 occupations from the previous High-skill High-growth list were not published in the 2014-2024 Employment Projections; the impact of these omissions on the current High-skill High-growth list proved limited as many highly similar occupations remain.
- 12 “new” occupations not previously found in the 2012-2022 Employment Projections were included in the latest set; most of these were small with less than 400 jobs.
- 320 of the 657 occupations common to both sets of projections saw their projected growth rates decline across projections; as before those experiencing the largest declines were related to manufacturing or oil and gas exploration.
- 338 of the 657 occupations common to both sets of projections saw either no change or increased expectations for job growth; those showing the largest increases were service-sector roles ranging from clerical, to personal, to professional.
- The share of occupations by educational requirements did not change significantly across projections after adjusting for the omitted 113 occupations; however, several individual occupations experienced changes in their respective educational requirements.
- Approximately 30 occupations saw changes in the amount of experience in a related occupation or the amount of on-the-job training required.

Introduction

Over the past two decades, the Employment Projections have remained an essential piece of labor market information used to guide workforce development efforts by entities like the Gulf Coast Workforce Board. Updated every two years and projecting a decade into the future, the projections currently cover the timeframe of 2014 to 2024 and now supersede the previous set of 2012 to 2022. While it may seem contradictory to update long-term projections, these biannual revisions allow the data to reflect changes across various industries and occupations at regular intervals. As new fields and jobs emerge, or the growth prospects of existing industries and occupations change, it is important for workforce development practitioners to have the latest available information that reflects the evolving local economy.

This report will provide a systematic analysis of the differences between the previous 2012-2022 projections and the “new” 2014-2024 projections. The aim of this exercise is to catalog and highlight any and all differences between the two as they relate to changes in the industries and occupations from various standpoints such as projected growth rates, educational and work experience and on-the-job training requirements. This exercise takes on added importance given that the Texas Workforce Commission (TWC), which localizes estimates initially developed by the Bureau of Labor Statistics at the national level, recently changed its methodology. Previously the projections for the various Workforce Development Areas (WDAs) across the state were modeled after statewide estimates. With the advent of the most recent projections, TWC began producing estimates based on local data. This has resulted in significant changes to the number of occupations reported although the impact on topline estimates proved limited. Finally, it should be noted that the new projections for the Gulf Coast Region appear to capture the start of the downturn in the energy industry that began in late-2014. This is evidenced by significant downward revisions to projected growth in various industries and occupations that just a few years ago were expected to increase in many cases by double-digit percentages. The report will begin by exploring the changes in projected growth for industries across both sets of projections, which will then be followed by a similar but more extensive analysis of occupations based on several dimensions.

Changes across the 2012-2022 and 2014-2024 Industry Employment Projections

We begin with the topline employment levels of the two 10-year periods in question. Previously, employment in the 13-county region in 2012 was projected to be 2,987,190 rising to 3,699,620 in 2022 for a net increase of 712,430 jobs. The corresponding figures for 2014-2024 currently stand at 3,121,710 with an anticipated rise to 3,821,030 resulting in a net growth of 699,320 jobs. By advancing the employment projections by two years, the first noteworthy difference between the previous and current sets becomes apparent as the outlook for projected job growth in the Gulf Coast Region has been lowered by 13,110 jobs. This fall in expectations was also reflected in a lower projected growth rate of 23.8 percent for 2012-2022 compared to 22.4 percent for 2014-2024. (See Table 1.)

Table 1. Comparison of 2012-2022 to 2014-2024 Industry Employment Projections, 13-County Gulf Coast Region

Projections Characteristics	2012-2022 Projections	2014-2024 Projections	Net/Pct Point Change across Projections
Average Annual Employment (Base Year)	2,987,190	3,121,710	134,520
Average Annual Employment (Final Year)	3,699,620	3,821,030	121,410
Projected Net Change	712,430	699,320	-13,110
Projected Percent Change	23.8%	22.4%	-1.4 pp

Source: Texas Workforce Commission - LMCI

Industries with the Largest Declines in Growth Expectations across Projections

However, this relatively small decline in percentage point terms (-1.4 pp) at the topline belied lowered growth expectations for many industries that just two years earlier were anticipated to deliver some of the Gulf Coast Region's strongest job growth. In total, 124 out of 274 4-digit NAICS industries for which data were available saw downward revisions in their projected growth to varying degrees. *Steel Product Manufacturing from Purchased Steel (NAICS 3312)* saw the largest decline with a 2012-2022 forecasted growth rate of +28.1 percent that was subsequently lowered to -27.3 percent for net percentage point decline of -55.4. This was followed by *Agriculture, Construction, & Mining Machinery Manufacturing (NAICS 3331)*, previous: +34.5 percent versus current: -20.7 percent, and *Other Fabricated Metal Product Manufacturing (NAICS 3329)*, previous +35.1 percent versus current: -14.9 percent.

In fact, among the top-10 industries experiencing the largest downward revisions in projected growth, seven were manufacturing-related while the remaining three belonged to oil and gas exploration, production, support services, or machinery and equipment rental and leasing. This latter industry was the only among these 10 to maintain a positive projected growth rate albeit significantly less than before. If not already apparent, the common thread among many of the industries with largest downward revisions was there either direct relation to oil and gas or their provision of inputs to the industry in the form of semi-finished materials, parts, or equipment. In short, the current 2014-2024 projections explicitly reflect the downturn in the energy industry that began in the fourth quarter of 2014 and more troublingly

suggest that the region’s most important sector will continue to languish assuming no change in industry fundamentals before 2024. (see Table 2.)

Table 2. Top-10 Industries with Largest Percentage Point Decline in Projected Growth between 13-County Gulf Coast Region 2012-2022 and 2014-2024 Employment Projections

NAICS	Industry Title	Annual Average Employment 2014	Annual Average Employment 2024	Percent Change 2012-2022 Projections	Percent Change 2014-2024 Projections	Percentage Point Change in Projected Growth Rates 2012-2022 vs. 2014-2024
3312	Steel Product Mfg. from Purchased Steel	2,270	1,650	28.1%	-27.3%	-55.4%
3331	Ag., Construction, & Mining Machinery Mfg. ¹	42,680	33,860	34.5%	-20.7%	-55.2%
3329	Other Fabricated Metal Product Mfg. ¹	17,590	14,970	35.1%	-14.9%	-50.0%
2111	Oil & Gas Extraction ¹	54,140	48,610	39.4%	-10.2%	-49.6%
3327	Machine Shops & Threaded Product Mfg.	13,700	10,900	25.3%	-20.4%	-45.7%
3321	Forging & Stamping	2,970	2,390	25.5%	-19.5%	-45.0%
3328	Coating, Engraving, & Heat Treating Metals	7,470	6,320	29.5%	-15.4%	-44.9%
2131	Support Activities for Mining ¹	52,890	42,980	25.3%	-18.7%	-44.1%
5324	Machinery & Equip. Rental & Leasing	7,780	8,650	55.1%	11.2%	-43.9%
3262	Rubber Product Mfg.	1,530	1,250	25.2%	-18.3%	-43.5%

Source: Texas Workforce Commission - LMCI

¹Denotes industry targeted by the Gulf Coast Workforce Board as of 2017.

Industries with the Largest Increases in Growth Expectations across Projections

Conversely, there were 150 industries that saw their projected rates of job growth post either smaller declines going forward, turn from negative to positive, or increase to an even faster pace across the two sets of projections. Some of the industries experiencing the sharpest upward expectation employed relatively few workers (e.g. < 50) therefore it proved useful to limit analysis to industries with a least 1,000 jobs as of 2014. Applying this criterion revealed that *Scientific Research and Development Services (NAICS 5417)* experienced the greatest reversal of fortunes with a previous projected decline of -14.2 percent compared to current projected growth of 18.8 percent. This was followed by *Pipeline Transportation of Natural Gas (NAICS 4862)*, previous: -14.9 percent versus current: 16.4 percent and *Book and News Dealers (NAICS 4512)*, previous: -12.9 percent versus current: 15.6 percent.

Among the remaining industries in the top-10 also seeing improvement across projections were those related to postal services, assisted living facilities, power generation, and office supply stores. While much more varied than the industries now projected to decline compared to the previous projections, in general the ones poised to accelerate consisted of largely service sector industries whose increases in employment are largely a function of the explosive population growth in the Gulf Coast over the past several years. On a final note, two healthcare-related industries not found in the 2012-2022 projections appeared in the current set and displayed relatively high rates of projected growth: *Private* and *Public*

Specialty Hospitals (NAICS 6223), 30.4 percent and Public and Private Psychiatric and Substance Abuse Hospitals (NAICS 6223), 34.4 percent.

Table 3. Top-10 Industries with Largest Percentage Point Increase in Projected Growth between 13-County Gulf Coast Region 2012-2022 and 2014-2024 Employment Projections¹

NAICS	Industry Title	Annual Average Employment 2014	Annual Average Employment 2024	Percent Change 2012-2022 Projections	Percent Change 2014-2024 Projections	Percentage Point Change in Projected Growth Rates 2012-2022 vs. 2014-2024
5417	Scientific Research & Development Services	6,000	7,130	-14.2%	18.8%	33.1%
4862	Pipeline Transportation of Natural Gas	6,110	7,110	-14.9%	16.4%	31.2%
4512	Book & News Dealers	1,670	1,930	-12.9%	15.6%	28.5%
4911	Postal Services, Public & Private	9,400	10,750	-7.8%	14.4%	22.1%
6233	Continuing Care & Assisted Living Facilities	8,890	12,550	22.4%	41.2%	18.8%
2211	Power Generation & Supply	12,260	14,910	4.5%	21.6%	17.1%
4532	Office Supplies, Stationery, & Gift Stores	4,790	5,310	-5.9%	10.9%	16.8%
3231	Printing & Related Support Activities	5,450	5,310	-18.3%	-2.6%	15.7%
6117	Educational Support Services, Public & Private	1,660	2,390	29.5%	44.0%	14.5%
6216	Home Health Care Services	47,920	72,890	38.5%	52.1%	13.6%

Source: Texas Workforce Commission - LMCI

¹Only includes industries with average annual employment in 2014 of 1,000 jobs or more.

Comparison of Occupational Projections 2012-2022 vs. 2014-2024

The 2012-2022 projections included occupational projection data for 770 detailed occupations out of an approximate 820 total possible occupations at the 6-digit SOC level. It is to be expected that locally some occupations would lack sufficient data to be published either due to limited sample size and/or concerns over possible disclosure of respondent identifiable information. In other cases, certain occupations may simply be absent from the regional economy. Due to the inability to publish data on roughly 50 occupations, topline reported total employment differed from summed employment of all individual occupations. In the case of the 2012-2022 projections, reported employment in the base year stood at 2,987,190 while summed employment stood at 2,981,970. This translated to a difference of 5,220 jobs or 0.2 percent of total employment that could not be ascribed to any particular occupation. Similar results were found for 2022 indicating that overall, the previous set of projections were highly comprehensive in their reporting on the full range of occupations in the Gulf Coast Region.

Occupations Omitted from the 2014-2024 Employment Projections

In contrast, the 2014-2024 occupational projections told a somewhat different story. First, data were reported for only 669 detailed occupations. This equated to 13.1 percent decrease in the total number of detailed occupations compared to the previous set of projections. Performing a cross verification

process, it was determined that 113 occupations that were present in the 2012-2022 projections were absent from the 2014-2024 projections. However, there were 12 “new” occupations, which will be examined in a later section, that were present in the 2014-2024 projections but absent from the earlier 2012-2022 projections. The net result was a difference of 101 occupations between the previous and current projections.

Regardless, the smaller number of total occupations reported in the current projections resulted in a much larger number of jobs about which we have no information compared to the previous projections. In this instance, for base year 2014, total reported employment was 3,121,710 compared to a summed total of 3,078,540. This resulted in eight times more jobs (43,170, 1.4 percent of total employment) that could not be ascribed to any particular occupation. Similar results were found for reported and summed projected totals in 2024.

Returning to the 113 occupations omitted from the 2014-2024 projections, the following is a count of these “missing” occupations by major occupational group. *Production Occupations* lost the largest number of detailed occupations with 15, followed by *Construction and Extraction* (13), *Personal Care and Service* (11), *Arts, Design, Entertainment, Sports, and Media* (10), *Transportation and Material Moving* (9) and *Installation, Maintenance, and Repair* (9). Note that these figures do not reflect the addition of “new” occupations not present in the 2012-2022 projections. (See Chart 1.)

Chart 1. Count of Occupations in Previous 13-County Gulf Coast Region 2012-2022 Occupational Employment Projections but Excluded from 2014-2024 Projections by Major Occupational Group



“New” Occupations Included in the 2014-2024 Employment Projections

As mentioned, the 2014-2024 projections included 12 “new” occupations not found in the previous projections. The common thread among these occupations was that most were quite small with 30 up to 380 jobs, excluding the outlier *Teachers and Instructors, All Other, Excluding Substitute Teachers*. This occupation had an average annual employment of 3,220 in 2014 projected to rise to 3,990 in 2024 and was one of three designated “All Other.” Collectively, these new occupations came from an assortment of eight distinct occupational groups with no one group dominating. Altogether this group added up to 4,930 jobs in 2014 and with a projected increase to 5,930 jobs in 2024 although four are expected to see no growth over the 10-year period. (See Table 4.)

Table 4. "New" Occupations Present in 13-County Gulf Coast Region 2014-2024 Projections Not Found Previous in 2012-2022 Projections

NAICS	Occupational Title	Annual Average Employment 2014	Annual Average Employment 2024	Net Change 2014-2024	Percent Change 2014-2024
15-2091	Mathematical Technicians	120	130	10	8.3%
19-1032	Foresters	30	30	0	0.0%
19-2011	Astronomers	40	40	0	0.0%
19-2043	Hydrologists	40	50	10	25.0%
23-1012	Judicial Law Clerks	30	30	0	0.0%
23-1021	Admin. Law Judges, Adjudicators, & Hearing Officers	380	410	30	7.9%
25-3097	Teachers & Instructors, All Other, Exc. Substitute Teachers	3,220	3,990	770	23.9%
27-2011	Actors	270	320	50	18.5%
27-2099	Entertainers/Performers, Sports & Related Workers, All Other	180	210	30	16.7%
39-3019	Gaming Service Workers, All Other	180	180	0	0.0%
47-4071	Septic Tank Servicers & Sewer Pipe Cleaners	260	320	60	23.1%
51-2011	Aircraft Structure, Surfaces, Rigging, & Systems Assemblers	180	220	40	22.2%
-	Total	4,930	5,930	1,000	20.3%

Source: Texas Workforce Commission - LMCI

Occupations with the Largest Declines in Growth Expectations across Projections

As noted earlier topline growth expectations for industries, which also applies to occupations, saw only a slight decline from 23.8 percent to 22.4 percent between 2012-2022 and 2014-2024. However, among the 657 occupations common to both sets of projections, 320 or just under half saw their projected growth rates decline across projections. Limiting analysis to occupations with average annual employment in 2014 of at least 1,000 jobs yielded similar results to those observed among industries with lowered growth outlooks. All of the top-10 occupations in this instance were related to manufacturing or direct oil and gas exploration.

“Missing” Occupations’ Impact on the Current Gulf Coast Workforce Board

High-skill High-growth Occupation List as of 2017

Among these 113 occupations “missing” from the 2014-2024 projections, seven were previously designated as High-skill High-growth based on 2012-2022 projection data. As was the case among the “new” occupations described earlier, most of these occupations were fairly small with most containing fewer than 340 jobs. One exception, *Computer Hardware Engineers*, was estimated to have 1,560 jobs in 2012 rising to 1,870 in 2022. It should however be noted that the absence of these occupations from the current High-skill High-growth list does not signify a lack of support on the part of the Gulf Coast Workforce Board. Currently and in past, the Board has typically included nearly all *Engineers, Primary, Secondary and Special Education Instructors, and Healthcare practitioner and Technical Occupations* regardless of size, growth, rates etc. due to persistent demand for workers in these fields. Therefore, while not explicitly targeted by the Board, their association with other similar High-skill High-growth occupations ensures that they will continue to be recognized as providing strong career prospects for region’s workforce. (See table below)

Occupations Designated as High-skill High-growth in 2012-2022 Projections Not Published in 2014-2024 Projections

NAICS	Industry Title	Annual Average Employment 2012	Annual Average Employment 2022	Net Change 2012-2022	Percent Change 2012-2022
17-2021	Agricultural Engineers	10	10	0	0.0%
17-2061	Computer Hardware Engineers	1,560	1,870	310	19.9%
17-2161	Nuclear Engineers	160	200	40	25.0%
25-2023	Career/Technical Education Teachers, Middle School	340	440	100	29.4%
25-2059	Special Education Teachers, All Other	140	170	30	21.4%
29-1022	Oral & Maxillofacial Surgeons	80	100	20	25.0%
29-1023	Orthodontists	200	240	40	20.0%
-	Total	2,490	3,030	540	21.7%

Source: Texas Workforce Commission - LMCI

Welding, Soldering, & Brazing Mach Setters/Operators/Tenders (SOC 51-4122), not to be confused with *Welders, Cutters, Solderers, & Brazers (SOC 51-4121)*, were projected to grow 51.3 percent during the 2012-2022 timeframe which stood in stark contrast to their 2014-2024 projected decline of -18.4 percent. This translates to 69.7 percentage point decrease between the previous and current projections. This was followed by *Heat Treating Equipment Setters, Operators, & Tenders (SOC 51-4191)* previous: +29.3 percent versus current: -26.2 percent, and *Milling & Planing Machine Setters, Operators, & Tenders (SOC 51-4035)* previous: +17.4 percent versus current: -30.8 percent. Lastly, the final two in this top-10 list: *Petroleum Engineers (SOC 17-2171)* and *CNC Machine Tool Operators, Metal/Plastic (SOC 51-4011)*, were the only occupations in this group to maintain positive growth expectations in 2014-2024 with projected increases of +6.5 percent and +9.0 percent respectively, however these figures were down significantly from +48.7 percent and +49.7 percent just a few years earlier. (See Table 5.)

Table 5. Top-10 Occupations with Largest Percentage Point Decline in Projected Growth between 2012-2022 and 2014-2014, 13-County Gulf Coast Region Employment Projections¹

NAICS	Occupational Title	Annual Average Employment 2014	Annual Average Employment 2024	Percent Change 2012-2022 Projections	Percent Change 2014-2024 Projections	Percentage Point Change in Projected Growth Rates 2012-2022 vs. 2014-2024
51-4122	Welding, Soldering, & Brazing Mach Setters/Oprs/Tenders	1,520	1,240	51.3%	-18.4%	-69.7%
51-4191	Heat Treating Equipment Setters, Oprs, & Tenders	1,220	900	29.3%	-26.2%	-55.5%
51-4035	Milling & Planing Machine Setters, Oprs, & Tenders	1,590	1,100	17.4%	-30.8%	-48.2%
51-4034	Lathe/Turning Mach Tool Setters/Oprs/Tenders	3,620	2,540	17.1%	-29.8%	-46.9%
47-5013	Service Unit Operators, Oil, Gas, & Mining ²	7,860	6,540	28.7%	-16.8%	-45.5%
47-5012	Rotary Drill Operators, Oil & Gas	4,550	3,770	28.3%	-17.1%	-45.5%
47-5011	Derrick Operators, Oil & Gas	3,400	2,860	28.4%	-15.9%	-44.2%
47-5071	Roustabouts, Oil & Gas	8,330	7,090	27.4%	-14.9%	-42.3%
17-2171	Petroleum Engineers ²	10,700	11,400	48.7%	6.5%	-42.1%
51-4011	Computer-Controlled Machine Tool Oprs, Metal/Plastic	5,240	5,710	49.7%	9.0%	-40.8%

Source: Texas Workforce Commission - LMCI

¹Only includes occupations with average annual employment in 2014 of 1,000 jobs or more.

²Denotes High-skill High-growth occupation targeted by the Gulf Coast Workforce Board as of 2017.

Occupations with the Largest Increases in Growth Expectations across Projections

In a continuation of the parallels previously observed between industries and occupations, the occupations with the most upwardly revised expectations were much more varied than those projecting declines. Once again limiting analysis to occupations with at least 1,000 jobs as of 2014, we find that services tended to dominate with Data Entry Keyers (SOC 43-9021) posting the largest reversal of this group. Previously this occupation was expected to decline -17.7 percent between 2012-2022. It is now anticipated to grow 7.0 percent between 2014-2024 for 24.7 percentage point increase. This was perhaps one of the most surprising developments across projections given that this occupation’s job duties according to O*Net Online consist of “Operat[ing] a data entry device, such as keyboard or photo composing perforator. Duties may include verifying data and preparing materials for printing.” Given trends in automation along with these activities largely being subsumed within general office functions, the driving forces behind this trend are uncertain. Two possibilities include the incorporation of new on-the-ground knowledge into the estimation process or that the rapid population growth of the past several years will offset declines that might have otherwise occurred.

Other occupations experiencing sharp upward revisions in growth expectations were *Postal Service Mail Carriers* (SOC 43-5052), previous: -6.9 percent versus current: 16.5 percent, and *Reinforcing Iron & Rebar Workers* (SOC 47-2171) previous: +23.8 percent versus current: +46.9 percent. The latter occupation may be related to the rapid growth in the *Construction* that continued to take place through 2014 although year-over-year job growth in this sector has now been in a state of decline since mid-2016. Lastly, one occupation deserving an honorable mention and excluded from the above analysis due to its sub-1,000 employment level was that of *Wind Turbine Service Technicians* (SOC 49-9081). Among all 657 occupations common to both sets of projections, this occupation related to alternative energy not

only had the largest upward revision of any occupation but also held the title of the occupation with the fastest projected growth rate. Over the 2012-2022 timeframe this occupation was already projected to grow substantially faster than average at 44.9 percent. Current projections now anticipate a growth rate of 96.8 percent, effectively doubling this occupation’s job count over the 10-year period. (See Table 6.)

Table 6. Top-10 Occupations with Largest Percentage Point Increases in Projected Growth between 2012-2022 and 2014-2014, 13-County Gulf Coast Region Employment Projections¹

NAICS	Occupational Title	Annual Average Employment 2014	Annual Average Employment 2024	Percent Change 2012-2022 Projections	Percent Change 2014-2024 Projections	Percentage Point Change in Projected Growth Rates 2012-2022 vs. 2014-2024
43-9021	Data Entry Keyers	5,000	5,350	-17.7%	7.0%	24.7%
43-5052	Postal Service Mail Carriers	5,510	6,420	-6.9%	16.5%	23.4%
47-2171	Reinforcing Iron & Rebar Workers	1,430	2,100	23.8%	46.9%	23.1%
35-3022	Counter Attendants; Cafeteria/Food Concession/Coffee Shop	17,760	24,700	17.3%	39.1%	21.8%
47-2181	Roofers	1,080	1,440	14.0%	33.3%	19.4%
43-5021	Couriers & Messengers	1,490	1,840	5.8%	23.5%	17.7%
43-5053	Postal Service Mail Sorters/Processors/Processing Mach Oprs	1,480	1,560	-10.4%	5.4%	15.8%
35-1011	Chefs & Head Cooks	2,720	3,720	21.9%	36.8%	14.9%
35-3011	Bartenders	8,900	12,640	28.0%	42.0%	14.1%
43-4181	Reservation & Transportation Ticket Agents & Travel Clerks	2,150	2,610	8.4%	21.4%	13.0%

Source: Texas Workforce Commission - LMCI

¹Only includes occupations with average annual employment in 2014 of 1,000 jobs or more.

Changes in Typical Educational Requirements across Projections

Given the loss of over 100 occupations between the two sets of projections, it was worth examining the extent to which the share of occupations by typical education required also changed. Among the eight official levels of educational attainment, the number of occupations requiring a *high school diploma or equivalent* saw the largest decrease, down from 329 to 257. This resulted in its share falling from 43 percent to 38 percent of all occupations. The number of occupations requiring *bachelor’s degree* also saw a modest decline from 163 to 158, however its share of occupations actually *rose* from 21 percent to 24 percent. Beyond these changes, the proportions of occupations by typical educational requirement saw little to no movement. At first glance the above dynamic between high school diplomas and bachelor’s degree would seem to reinforce the notion that educational requirements increase over time, especially between high school and traditional four-year postsecondary education as these remain the two largest categories. While in the long-run this might prove true, adjusting for the occupations eliminated from the 2014-2024 projections revealed that the majority of the change could attributed an over-representation of excluded occupations requiring only a high school diploma and an under-representation of occupations requiring a bachelor’s degree. Once this was taken into account, the magnitude of the changes between these educational levels dropped substantially indicating that the overall mix of educational requirements for occupations has not changed significantly across employment projections. (See Table 7.)

Table 7. Count and Percent Share of Occupations by Typical Education Required, 2012-2022 and 2014-2024, 13-County Gulf Coast Region Occupational Employment Projections

Typical Education Required	No. of Occupations Requiring Typical Education (2012-2022)	No. of Occupations Requiring Typical Education (2014-2024)	Pct of Occupations Requiring Typical Education (2012-2022)	Pct of Occupations Requiring Typical Education (2014-2024)
Less than high school/No formal educational credential*	92	83	12%	12%
High school diploma or equivalent	329	257	43%	38%
Some college, no degree	4	6	1%	1%
Postsecondary non-degree award	39	39	5%	6%
Associate's degree	47	40	6%	6%
Bachelor's degree	163	158	21%	24%
Master's degree	37	31	5%	5%
Doctoral or professional degree	59	55	8%	8%
Total	770	669	100%	100%

Source: Texas Workforce Commission - LMCI

*Beginning with the 2014-2024 projections, "less than high school" is now referred to as "no formal educational credential."

Despite the overall mix of occupations by typical education seeing little change, there were individual occupations whose educational requirements increased and in some cases actually decreased. Of the 657 occupations common to both 2012-2022 and 2014-2024 projections, a total of 25 saw changes in reported typical educational requirements. Table 8. visualizes these changes as "positive or negative steps" based on a low to high educational sequence starting with *no formal credential* and concluding with a *doctoral or professional degree*. Seven occupations saw increases from *high school diploma* to *bachelor's degree*. This change is indicated by four "+" signs which can be interpreted as a process of skipping over potential intermediate levels of education: *some college, no degree, a postsecondary non-degree award, and an associate's degree*. Again, given that the most common educational pathway is from high school to college, and that roughly two-thirds of all occupations require either a high school diploma or a bachelor's degree, this finding was not surprising in and of itself. However, from a "middle-skills" perspective this dynamic is less than optimal as signifies an occupation rapidly evolving from low-skilled to high-skilled which may exclude workers who do not follow a traditional educational trajectory or prefer a shorter-duration postsecondary experience.

As for the remaining changes in educational requirements, two occupations saw increases from *high school diploma* to *postsecondary non-degree award*, while three saw increases from *no formal credential* to *high school diploma*. The most noteworthy change given persistently high demand for the occupation occurred among *Registered Nurses (29-1141)*, whose educational requirements now reflect the need for a Bachelor of Science in Nursing compared to the previous requirement of an *associate's degree*. As mentioned, several occupations saw decreases in requirements with five declining from *high school diploma* to *no formal credential*. One occupation, *Recreation Workers (39-9032)*, saw the largest

decrease in educational requirements from *bachelor's degree* to a *high school diploma or equivalent*. (See Table 7.)

Table 8. Occupations Experiencing Changes in Typical Educational Requirements, 2012-2022 and 2014-2024, 13-County Gulf Coast Region Occupational Employment Projections

SOC	Occupational Title	2012-2022 Typical Ed. Requirements	2014-2024 Typical Ed. Requirements	Change in Ed. Requirement
11-9199	Managers, All Other	High school	Bachelor's	+ + + +
13-1021	Buyers & Purchasing Agents, Farm Products	High school	Bachelor's	+ + + +
13-1022	Wholesale & Retail Buyers, Ex. Farm Products	High school	Bachelor's	+ + + +
13-1023	Purchasing Agents, Ex. Wholesale, Retail, & Farm Products	High school	Bachelor's	+ + + +
13-1199	Business Operations Specialists, All Other	High school	Bachelor's	+ + + +
21-1011	Substance Abuse & Behavioral Disorder Counselors	High school	Bachelor's	+ + + +
27-1013	Fine Artists, Inc. Painters, Sculptors, & Illustrators	High school	Bachelor's	+ + + +
43-4161	Human Resources Assistants, Ex. Payroll & Timekeeping	High school	Associate's	+ + +
49-3052	Motorcycle Mechanics	High school	Postsecondary non-degree	+ +
49-3023	Auto Service Technicians & Mechanics	High school	Postsecondary non-degree	+ +
39-2021	Nonfarm Animal Caretakers	No formal credential	High school	+
53-7072	Pump Operators, Except Wellhead Pumps	No formal credential	High school	+
53-7073	Wellhead Pumps	No formal credential	High school	+
19-4061	Social Science Research Assistants	Associate's	Bachelor's	+
29-1141	Registered Nurses	Associate's	Bachelor's	+
43-3031	Bookkeeping, Accounting, & Auditing Clerks	High school	Some college, no degree	+
27-1012	Craft Artists	High school	No formal credential	-
27-2042	Musicians & Singers	High school	No formal credential	-
33-9091	Crossing Guards	High school	No formal credential	-
33-9092	Lifeguards, Ski Patrol, & Other Rec. Protective Svc. Workers	High school	No formal credential	-
47-4031	Fence Erectors	High school	No formal credential	-
51-1011	First-Line Supervisors of Production & Operating Workers	Postsecondary non-degree	High school	--
29-9099	Healthcare Practitioners & Technical Workers, All Other	Bachelor's	Postsecondary non-degree	--
53-5021	Captains, Mates, & Pilots of Water Vessels	Bachelor's	Postsecondary non-degree	--
39-9032	Recreation Workers	Bachelor's	High school	---

Source: Texas Workforce Commission - LMCI

*Beginning with the 2014-2024 projections, "less than high school" is now referred to as "no formal educational credential."

+ Indicates the number of steps in increased educational requirements, exclusive of the initial educational requirement.

- Indicates the number of steps in decreased educational requirements, exclusive of the initial educational requirement.

Note: the assumed educational sequence from low to high is as follows: no formal credential, high school diploma, some college no degree, postsecondary non-degree award, associate's degree, bachelor's degree, master's degree, doctoral or professional degree.

Changes in Work Experience in a Related Occupation Required across Projections

The dimension *Work Experience in a Related Occupation* can also provide complementary occupational information along with the *Typical Educational Requirements* previously discussed. Per the Bureau of Labor Statistics, the former "captures experience that is commonly considered necessary by employers or is a commonly accepted substitute for other, more formal types of training or education." While it is not

especially common for an occupation to require related work experience (roughly only 1 in 10 have this requirement), of the 657 occupations common to both 2012-2022 and 2014-2024 projections, nine saw changes in the amount of work experience required in a related occupation. Similar to the step-sequence employed in the previous analysis, a “+” or “-” was used to indicate movement between the three possible amounts of work experience: *none*, *less than 5 years*, and *5 years or more*. Six saw increases from *none* i.e. no work experience in a related occupation required to *less than 5 years*. A single occupation, *General & Operations Managers (SOC 11-1021)*, saw an increase from *less than 5 years* to *5 years or more*. Two saw decreases in work experience required with one dropping from *5 years or more* to *less than 5 years* while another fell from *less than 5 years* to no work experience required. (See Table 9.)

Table 9. Occupations Experiencing Changes in Work Experience in a Related Occupation Required, 2012-2022 and 2014-2024,

SOC	Occupational Title	2012-2022 Work Experience in a Related Occupation Required	2014-2024 Work Experience in a Related Occupation Required	Change in Work Exp. Requirement
11-9111	Medical & Health Services Managers	None	Less than 5 years	+
13-1075	Labor Relations Specialists	None	Less than 5 years	+
13-1141	Compensation, Benefits, & Job Analysis Specialists	None	Less than 5 years	+
25-1081	Education Teachers, Postsecondary	None	Less than 5 years	+
29-2053	Psychiatric Technicians	None	Less than 5 years	+
53-5021	Captains, Mates, & Pilots of Water Vessels	None	Less than 5 years	+
11-1021	General & Operations Managers	Less than 5 years	5 years or more	+
45-2021	Animal Breeders	Less than 5 years	None	-
11-9033	Education Administrators, Postsecondary	5 years or more	Less than 5 years	-

Source: Texas Workforce Commission - LMCI

+ Indicates an increase in the amount of work experience in related occupation required, exclusive of the initial work experience level required.

- Indicates an decrease in the amount of work experience in related occupation required, exclusive of the initial work experience level required.

Note: the assumed work experience sequence from low to high is as follows: none, less than 5 years, 5 years or more.

Changes in On-the-job Training Required across Projections

A third and final feature of the occupational employment projections that provides additional insight into job requirements is that of *On-the-job Training (OJT)*. This dimension differs from *Typical Education and Work Experience* in that according to the Bureau of Labor Statistics it is “training or preparation that is typically needed, once employed in an occupation, to attain competency in the occupation. Training is occupation specific rather than job specific; skills learned can be transferred to another job in the same occupation.” For an incumbent worker, a change in the amount of on-the-job training required can have a significant impact on the amount of time needed to reach proficiency, hence given the changes across projections previously discussed, it was worth examining the OJT from this perspective as well. We again employ a step-sequence to quantify the changes, which in order from low to high are: *none* i.e. no OJT

required, *short-term, moderate, long-term, apprenticeship, and internship/residency*. Of the 657 occupations common to both 2012-2022 and 2014-2024 projections, 23 saw changes in the amount of on-the-job training required with 13 seeing increases and 10 seeing decreases. *Personal Financial Advisors (SOC 13-2052)* increased from *none* to *long-term on-the-job training*, which was the largest change among these 23 occupations. Four occupations increased from *none* to *short-term OJT*. Seven occupations experienced a rise from *short-term* to *moderate* while another increased from *moderate* to *long-term*. One occupation experienced a decline from *long-term* on-the-job training to *moderate*. Three decreased from *moderate-term OJT* to no on-the-job training required while two decreased from *moderate* to *short-term*. This was the same as the number of occupations experiencing a decrease from *long-term* to *short-term OJT* and from *short-term OJT* to *none*. Lastly, it should be noted that of the six types of on-the-job training, including the *none* category, two types: *Apprenticeship* and *Internship/Residency* did not appear in the above analysis as there were no occupations that experienced changes to or from these OJT requirements. (See Table 10.)

Table 10. Occupations Experiencing Changes in On-the-job Training Required, 2012-2022 and 2014-2024, 13-County Gulf Coast Region Occupational Employment Projections

SOC	Occupational Title	2012-2022 On-the-job Training Required	2014-2024 On-the-job Training Required	Change in OJT Requirement
13-2052	Personal Financial Advisors	None	Long-term	+++
27-3011	Radio & Television Announcers	None	Short-term	+
39-9032	Recreation Workers	None	Short-term	+
49-2011	Computer, Automated Teller, & Office Machine Repairers	None	Short-term	+
49-2097	Electronic Home Entertainment Equip.Installers & Repairers	None	Short-term	+
33-3052	Transit & Railroad Police	Short-term	Moderate	+
41-3099	Sales Representatives, Services, All Other	Short-term	Moderate	+
43-3021	Billing & Posting Clerks	Short-term	Moderate	+
43-4041	Credit Authorizers, Checkers, & Clerks	Short-term	Moderate	+
51-2021	Coil Winders, Tapers, & Finishers	Short-term	Moderate	+
51-2022	Electrical & Electronic Equipment Assemblers	Short-term	Moderate	+
51-2023	Electromechanical Equipment Assemblers	Short-term	Moderate	+
49-3021	Auto Body & Related Repairers	Moderate	Long-term	+
29-9011	Occupational Health & Safety Specialists	Short-term	None	-
43-4161	Human Resources Assistants, Ex. Payroll & Timekeeping	Short-term	None	-
49-9098	Helpers--Installation, Maintenance, & Repair Workers	Moderate	Short-term	-
51-6063	Textile Knitting & Weaving Mach. Setters, Ops., & Tenders	Moderate	Short-term	-
41-9022	Real Estate Sales Agents	Long-term	Moderate	-
15-1151	Computer User Support Specialists	Moderate	None	--
21-1011	Substance Abuse & Behavioral Disorder Counselors	Moderate	None	--
29-2054	Respiratory Therapy Technicians	Moderate	None	--
49-3023	Auto Service Technicians & Mechanics	Long-term	Short-term	--
49-3052	Motorcycle Mechanics	Long-term	Short-term	--

Source: Texas Workforce Commission - LMCI

+ Indicates the number of steps in increased on-the-job training requirements, exclusive of the initial educational requirement.

- Indicates the number of steps in decreased on-the-job training requirements, exclusive of the initial educational requirement.

Note: the assumed on-the-job training sequence from low to high is as follows: none, short-term, moderate, long-term, apprenticeship, internship/residency