Technical Notes

The Kentucky Future Skills Report (KFSR) is produced by the Kentucky Center for Statistics (KYSTATS) utilizing data from the Kentucky Longitudinal Data System (KLDS), Labor Market Information Section (Kentucky LMI), Kentucky Council on Postsecondary Education (CPE), Kentucky Department of Education (KDE), Kentucky SKILLS U, and Kentucky Unemployment Insurance (UI). The latest data update is February 2022 and revised in July 2022. This report was funded with state longitudinal data system grant funds.

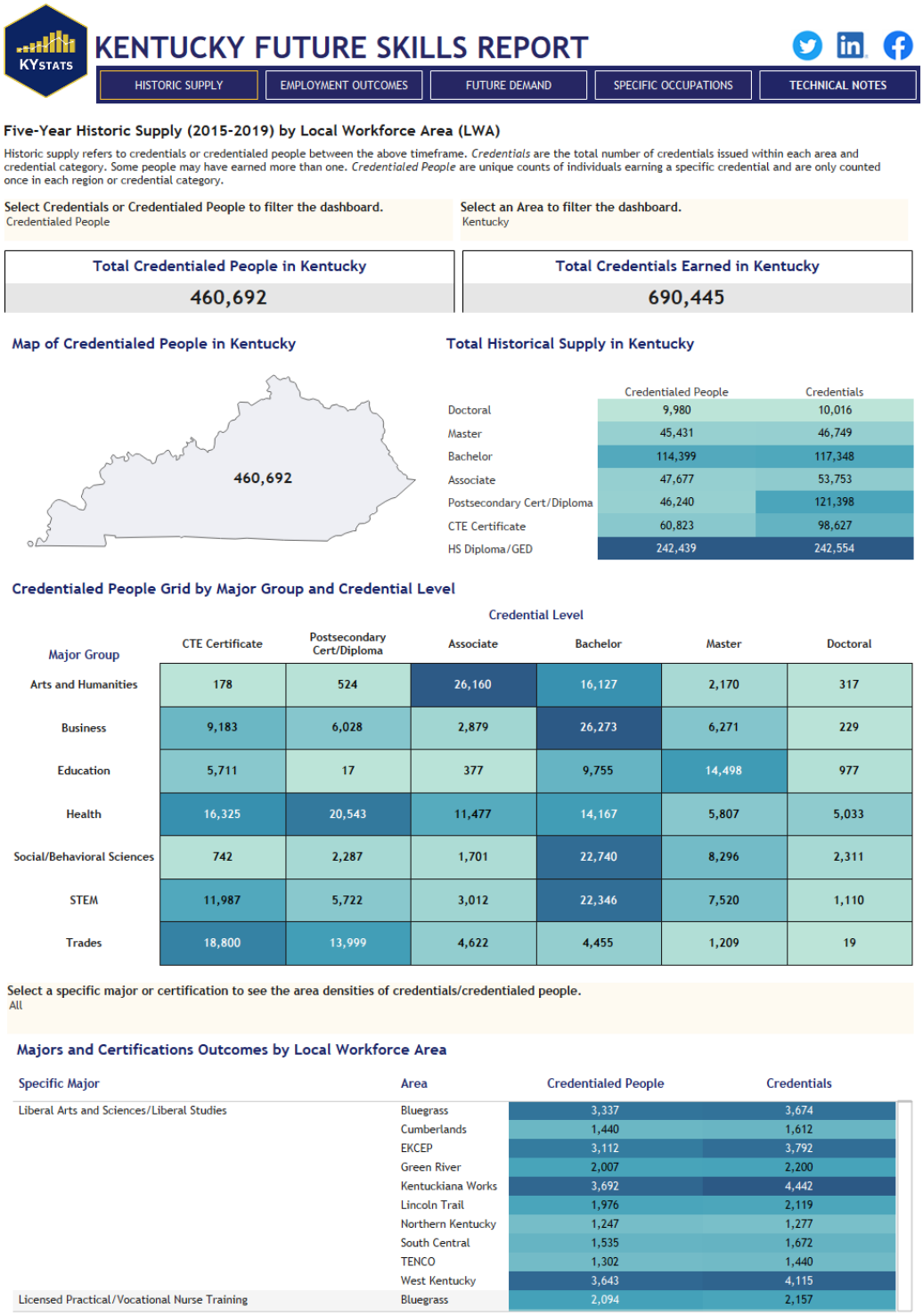
Occasionally, data from one source will not conform to data from another source because of differences in cohorts, how variables are defined, the treatment of missing data, and other factors. This means that data published in this report may not be comparable to data published in other reports. Some values are suppressed to preserve individual privacy. For specific details about metric formulas please refer to Appendix A. Some values are redacted to preserve individual privacy and conform to state laws. Redaction rules can be found in Appendix B.

Credential completion data in this report includes graduates from Kentucky's public high schools, in-state public and independent postsecondary institutions, and GED completers. Employment and wage outcome data includes only those firms covered by the UI System. Data on credential completions and employment outcomes were extracted from the KLDS. Mid-term (five-year) projected employment metrics are calculated from the long-term (ten-year) projections estimates also published by KYSTATS. Standard Occupational Codes (SOC) have been converted to the 2018 SOC system.

This report is divided into four distinct dashboards: Historic Supply, Employment Outcomes, Future Demand, and Specific Occupations. Statewide totals in Historic Supply, Future Demand, and Specific Occupations can be filtered by the ten Local Workforce Areas (LWAs).

Dashboard 1: Historic Supply

Users can switch to different dashboards by clicking the blue tabs at the top of the page. Technical Notes can be accessed by clicking the tab labeled technical notes, which define the terminology and methods of analysis in the report.



This section provides a five-year historic overview of skilled people credentialed to enter the workforce in Kentucky. The historic workforce supply of credentials and people spans the 2015 through 2019 Academic Years (AY). Supply is examined by both total credentials and also by people, which is indicated by the filter at the top of the page. The differentiation in

counts by people and by credentials is detailed below. Those without a known location have been excluded from Historic Supply.

Each chart can be filtered at the same time by choosing any combination of the following:

- Total Credentialed People or total Credentials
- Geographically by Area (State and LWA)

Credential categories in historic supply include: high school diploma/GED, CTE certificate, postsecondary certificate or diploma, associate degree, bachelor degree, master degree, and doctoral degree.

1. **Detail Level:**

    a. **Total Credentialed People:** This option shows the total number of people who earned credentials within each area and region. People receiving more than one credential are only counted once in each geographic region (LWA), and are only counted once in each credential category. The difference in the state-level aggregates and LWA aggregates results from certain credentials being attributable to the Commonwealth as a whole, but not to a specific county. People receiving credentials in multiple years are counted once in each year they received any number of credentials.

    b. **Total Credentials:** This option shows the total number of credentials issued within each area and region. People receiving more than one credential are counted multiple times – each credential is counted in each geographic region and also each credential category.

Walkthrough

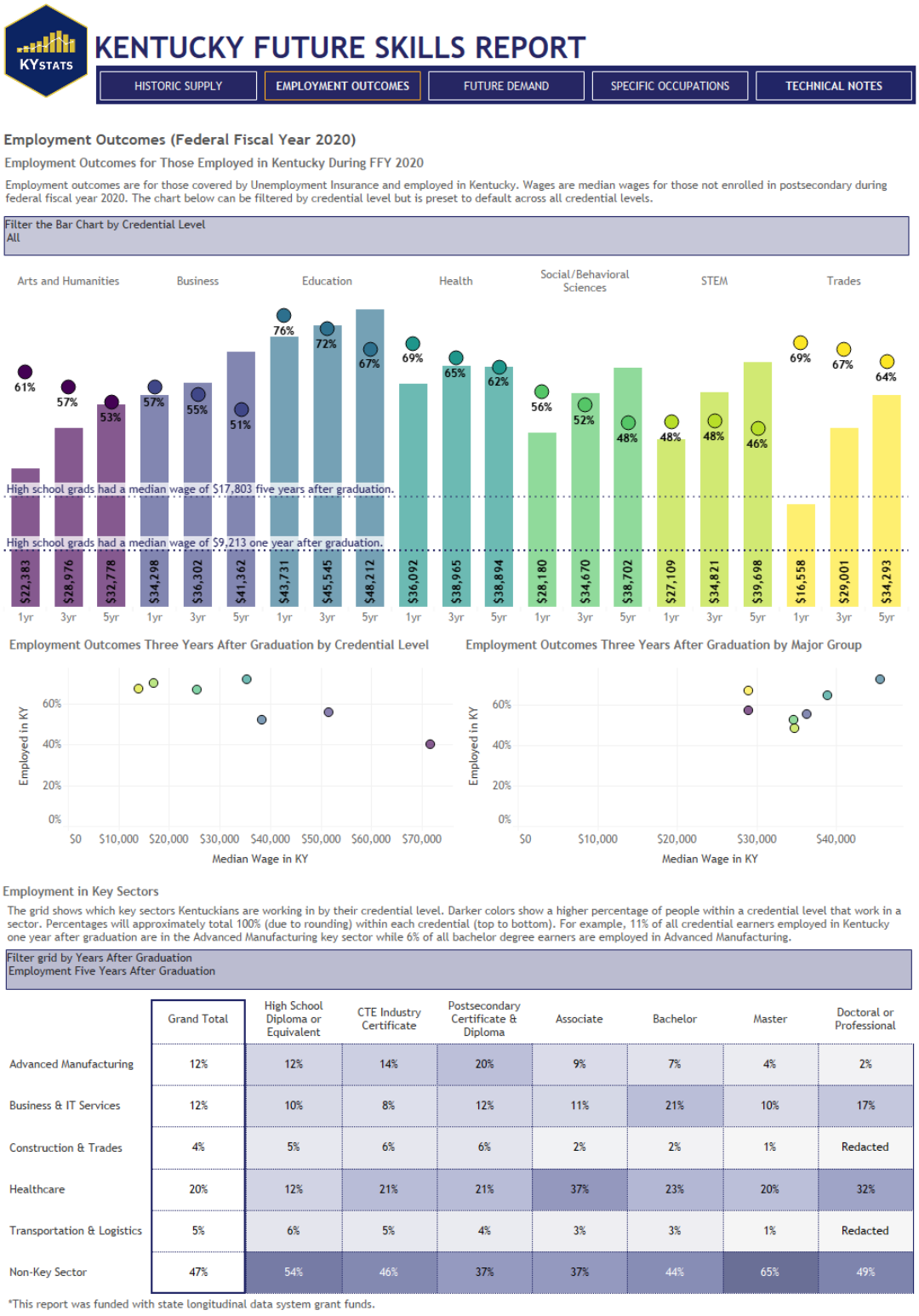
The map shows the distinct number of people earning a credential or the total number of credentials earned (depending on the filter value) at an institution within that area. Filtering an Area will filter the dashboard to metrics specific to the selected area.

The next chart breaks out the total credentialed people and credentials by credential level for the five year period.

The grid shows a cross-section between credential level and major group for the five year period.

The table at the bottom is a list of specific majors and can be filtered with the additional fitler above it. This table allows a user to select various majors or certifications and see the number of credentialed people and credentials by LWA.

Dashboard 2: Employment Outcomes



This section provides an overview of employment outcomes, including percent employed, key sector of employment, and median wage in Federal Fiscal Year 2020 (October 1, 2019 through

September 30, 2020) (FFY 2020) for people earning credentials in Academic Years (AY) 2018-19 (1Yr), 2016-17 (3Yr), and 2014-15 (5Yr).

Individuals were considered to be employed in Kentucky if they earned wages at a firm covered by the UI System during any quarter of FFY 2020 and were not reenrolled at a Kentucky public or independent postsecondary institution in AY 2020. The UI System does not include most of the self-employed, most federal employees, the military, or several other smaller categories of employment. Individuals who reenrolled in a postsecondary institution during AY 2020 are not included in any views of this dashboard. Wages are calculated as the median of the sum of all four fiscal quarters for each individual in the dataset. No annualization or proration of wages was performed.

Employment outcomes are presented for each individual's highest degree earned. If an individual received multiple credentials of the same level (e.g. two Master's degrees) in different years, the most recent degree is used. If they received multiple degrees of the same level in their most recent credential-receiving year, all such degrees are included once for each major category. In the numeric table and sector icons, the person will be counted only once in any given disaggregated/filtered view. As a result, any given disaggregate or aggregate filter combination of the table is accurate, but the disaggregates will not sum to the similarly aggregate totals when unfiltered.

Key sectors of employment were assigned by using the sector in which each completer earned their highest wage during their highest earning quarter in FFY 2020. The chart on key sectors of employment are created using groupings of the 2-digit North American Industry Classification System (NAICS) codes - the federal standard in classifying business establishments.

Walkthrough

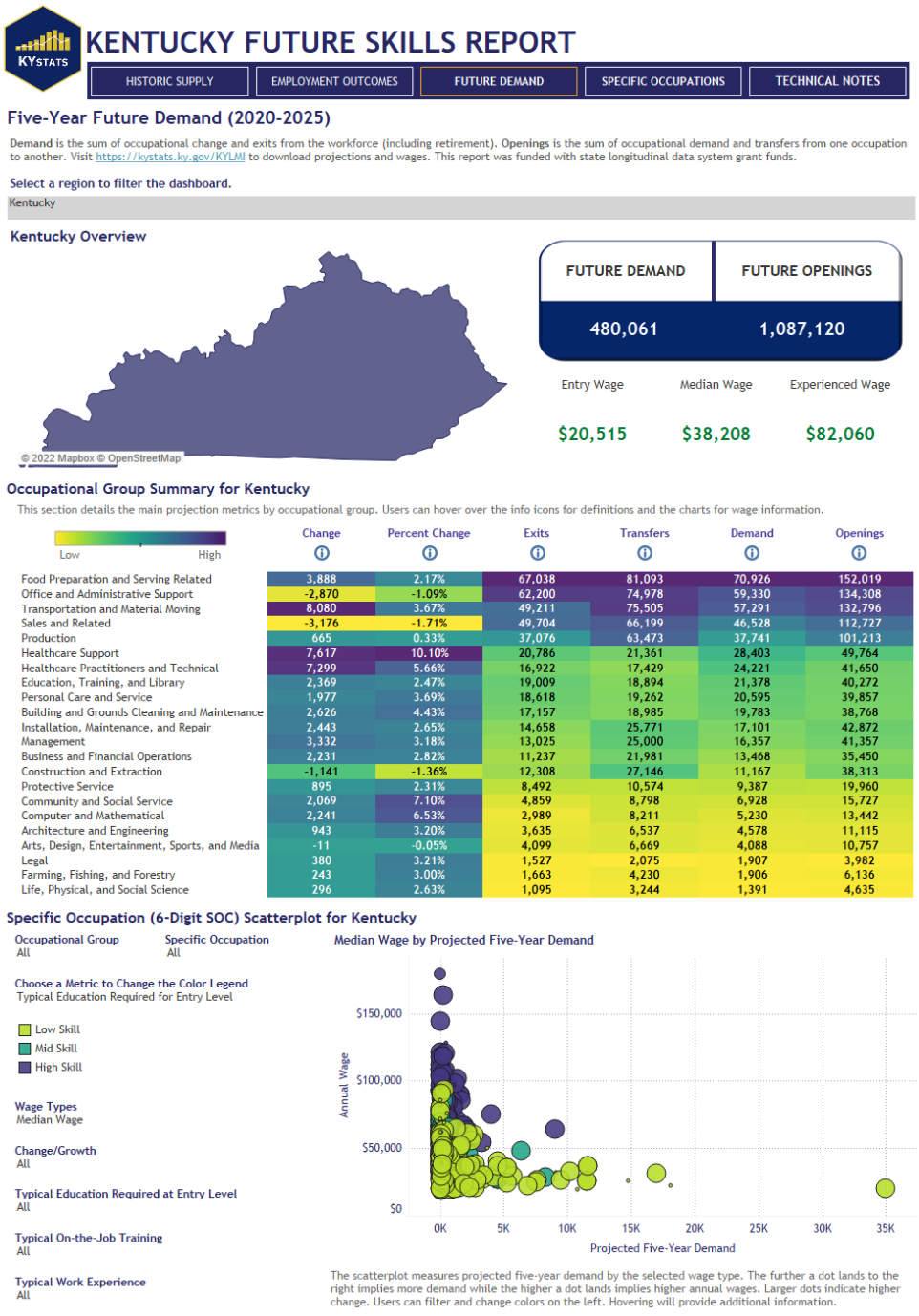
The credential level filter ranges from career and technical education certificate to doctoral level credentials. Changing the credential level filter will show statewide employment outcomes below.

The bar chart shows 1 to 5 year wages (relative to FFY 2020) as well as the employment percentage over time, represented by the circles. Hovering over the bars will show a tooltip with all relevant information.

The grid below shows the breakout of employment in key sectors by credential level. These can be filtered by years after graduation with the filter.

Dashboard 3: Future Demand

This dashboard provides an overview of projected 5-year employment demand in Kentucky for the years 2020-2025. See Appendix A for specific employment demand metrics and calculations.



KENTUCKY FUTURE SKILLS REPORT

HISTORIC SUPPLY | EMPLOYMENT OUTCOMES | FUTURE DEMAND | SPECIFIC OCCUPATIONS | TECHNICAL NOTES

Five-Year Future Demand (2020-2025)

Demand is the sum of occupational change and exits from the workforce (including retirement). **Openings** is the sum of occupational demand and transfers from one occupation to another. Visit https://kystats.ky.gov/KYLMI to download projections and wages. This report was funded with state longitudinal data system grant funds.

Select a region to filter the dashboard.

Kentucky

Kentucky Overview

FUTURE DEMAND	FUTURE OPENINGS
480,061	1,087,120

Entry Wage	Median Wage	Experienced Wage
$20,515	$38,208	$82,060

Occupational Group Summary for Kentucky

This section details the main projection metrics by occupational group. Users can hover over the info icons for definitions and the charts for wage information.

Low — High

	Change	Percent Change	Exits	Transfers	Demand	Openings
Food Preparation and Serving Related	3,888	2.17%	67,038	81,093	70,926	152,019
Office and Administrative Support	-2,870	-1.09%	62,200	74,978	59,330	134,308
Transportation and Material Moving	8,080	3.67%	49,211	75,505	57,291	132,796
Sales and Related	-3,176	-1.71%	49,704	66,199	46,528	112,727
Production	665	0.33%	37,076	63,473	37,741	101,213
Healthcare Support	7,617	10.10%	20,786	21,361	28,403	49,764
Healthcare Practitioners and Technical	7,299	5.66%	16,922	17,429	24,221	41,650
Education, Training, and Library	2,369	2.47%	19,009	18,894	21,378	40,272
Personal Care and Service	1,977	3.69%	18,618	19,262	20,595	39,857
Building and Grounds Cleaning and Maintenance	2,626	4.43%	17,157	18,985	19,783	38,768
Installation, Maintenance, and Repair	2,443	2.65%	14,658	25,771	17,101	42,872
Management	3,332	3.18%	13,025	25,000	16,357	41,357
Business and Financial Operations	2,231	2.82%	11,237	21,981	13,468	35,450
Construction and Extraction	-1,141	-1.36%	12,308	27,146	11,167	38,313
Protective Service	895	2.31%	8,492	10,574	9,387	19,960
Community and Social Service	2,069	7.10%	4,859	8,798	6,928	15,727
Computer and Mathematical	2,241	6.53%	2,989	8,211	5,230	13,442
Architecture and Engineering	943	3.20%	3,635	6,537	4,578	11,115
Arts, Design, Entertainment, Sports, and Media	-11	-0.05%	4,099	6,669	4,088	10,757
Legal	380	3.21%	1,527	2,075	1,907	3,982
Farming, Fishing, and Forestry	243	3.00%	1,663	4,230	1,906	6,136
Life, Physical, and Social Science	296	2.63%	1,095	3,244	1,391	4,635

Specific Occupation (6-Digit SOC) Scatterplot for Kentucky

Occupational Group: All

Specific Occupation: All

Choose a Metric to Change the Color Legend: Typical Education Required for Entry Level

- Low Skill
- Mid Skill
- High Skill

Wage Types: Median Wage

Change/Growth: All

Typical Education Required at Entry Level: All

Typical On-the-Job Training: All

Typical Work Experience: All

Median Wage by Projected Five-Year Demand

The scatterplot measures projected five-year demand by the selected wage type. The further a dot lands to the right implies more demand while the higher a dot lands implies higher annual wages. Larger dots indicate higher change. Users can filter and change colors on the left. Hovering will provide additional information.

Walkthrough

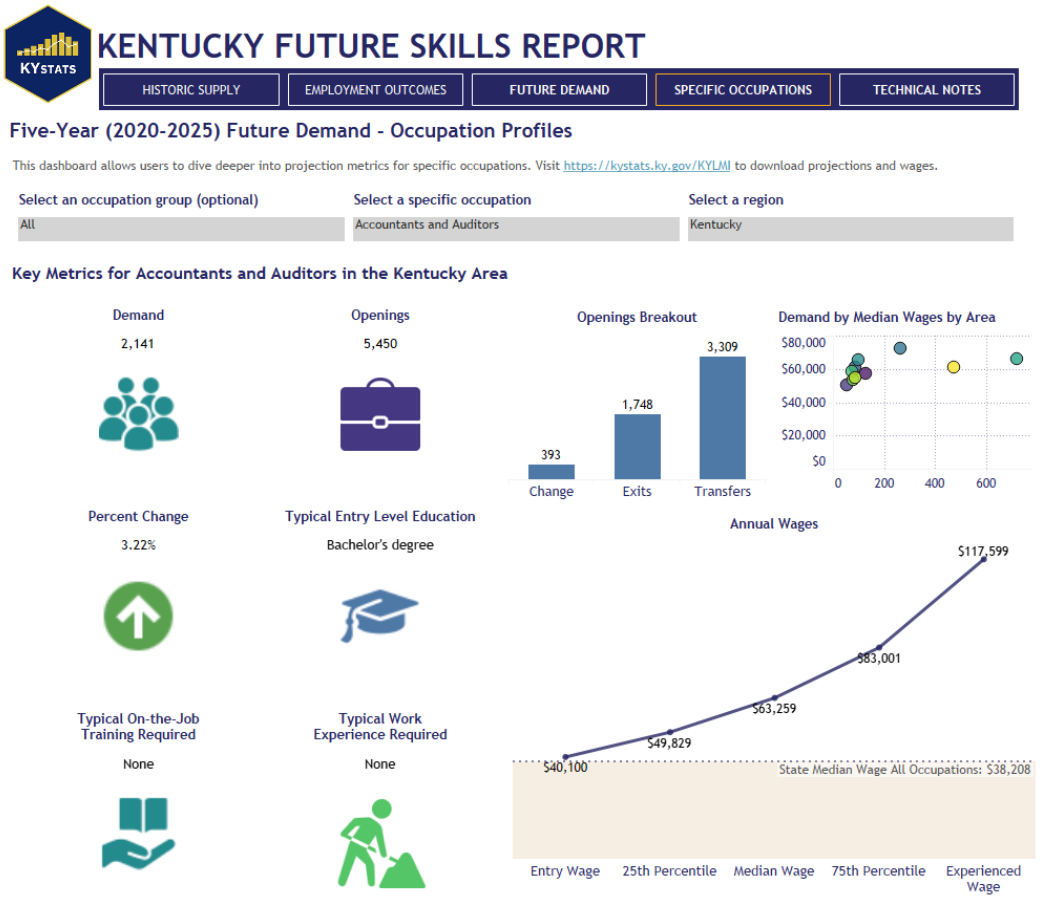
The first section gives an overview of the selected region. Users can filter the dashboard to reflect the selected region of choice (Local Workforce Areas or Kentucky). The map will identify the selected region. Key metrics are to the right of the map, and include the area's future demand, future openings, and wages (entry or 10^{th} percentile, median or 50^{th} percentile, and experienced or 90^{th} percentile).

The next section shows the occupational group summary for the selected region. Occupational groups are 2-digit SOC codes that categorize the specific occupations that use 6-digit SOC codes. Key projection metrics such as change, percent change, exits, transfers, demand, and openings can be found here. Hovering will provide the entry, median, and experienced annual wages for these groups. The color legend notes that low values are lighter and yellow and get darker and purple as they get higher. Info icons are below the metric titles and provide a definition.

Lastly, the scatter plot shows the selected demand by selected wage types for any specific occupation. The filters to the left apply only to the scatter plot and allow the user to manipulate the chart in many ways. Selecting an occupational group will only show specific occupations within that group. Wage types will let users change the vertical axis to plot dots by entry, median, or experienced wages. Lastly, users can filter by change, typical education requirements for entry level, typical on-the-job training, and typical work experience. Hovering over a circle will display an occupation along with the top Knowledge, Skills, and Abilities (KSAs) associated with that occupation. KSA information is from O*NET. The size of the circle will increase as growth within that occupation increases. The color legend can change between educational skill level, work experience, on-the-job training, and change. Educational skill is defined as low skill (high school or equivalent), mid-skill (career and technical education, postsecondary certificates or diplomas, or associate degree), and high skill (bachelor degrees or higher). Please see the legends beside the chart for more information.

Dashboard 4: Specific Occupations

This dashboard provides an overview or profile of each specific occupation (6-digit SOC) in Kentucky or the selected region, as well as a full list of occupations in the selected region.



Projections for All Specific Occupations in Kentucky

	Demand	Openings	Percent Change	Entry Wage	Median Wage	Experienced Wage
Fast Food and Counter Workers	34,989	66,006	3.69%	$17,372	$20,272	$27,088
Cashiers	18,092	38,777	-5.04%	$18,101	$22,149	$31,025
Laborers and Freight, Stock, and Material Movers, Hand	16,981	41,836	5.27%	$22,778	$31,301	$46,668
Retail Salespersons	14,754	35,252	-1.07%	$18,968	$25,509	$42,586
Team Assemblers	11,608	30,764	0.29%	$24,919	$36,721	$53,382
Assemblers and Fabricators, All Other	11,608	30,764	0.29%	$24,919	$36,721	$53,382
Personal Care Aides	11,561	17,795	18.04%	$18,977	$25,617	$41,902
Home Health Aides	11,561	17,795	18.04%	$18,977	$25,617	$41,902
Waiters and Waitresses	10,824	27,445	-0.41%	$17,102	$19,526	$30,289
Customer Service Representatives	10,232	25,665	0.83%	$21,638	$32,550	$53,738
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	9,454	17,777	3.92%	$18,905	$26,208	$41,000
Office Clerks, General						

This report was funded with state longitudinal data system grant funds.

Walkthrough

The first section shows key metrics such as 5-year projected demand (2020-2025), job openings, change, exits, transfers, wages, typical education requirements for entry level, typical on-the-job training, typical work experience, and projected demand by LWA for each occupation. Users can filter the dashboard by occupation group to narrow down occupations, by specific occupations, and regions of Kentucky.

At the bottom of the dashboard, users can find a full list of occupations within the selected region that can be sorted by clicking the sort button near each metric. See Appendix A for specific employment demand metrics and calculations.

APPENDIX A: METRIC FORMULAS

Data Sources:

Council on Postsecondary Education (CPE): Provides data from the Kentucky Postsecondary Education Data System (KPEDS). This system contains comprehensive information on postsecondary enrollments, coursework, grades, and degrees earned for all in-state postsecondary students that attend one of the following institution types: 4-Year Private (Independent), 2-Year Public (KCTCS), 4-Year Public Comprehensive, and 4-Year Public Research. In-state proprietary and out-of-state institutions are not included in this data system.

Kentucky Department of Education (KDE): KDE provides statistics and pertinent facts about schools and education in Kentucky including racial breakdowns, attendance, and graduation rates. KDE provides information on public PK-12 teachers and students.

KYSTATS (Kentucky Center for Statistics): KYSTATS collects and links data to evaluate education and workforce efforts in the Commonwealth. These data are maintained by KYSTATS in Kentucky's statewide longitudinal data system (KLDS). This includes developing reports, responding to research requests, and providing statistical data about these efforts so policymakers, agencies, and the general public can make better informed decisions. The wage and projections estimates in this report are drawn from a variety of statistical programs operated by the Labor Market Information Section (LMI). Specifically, projections estimates presented here are derived from the predicted demand for labor outlined in KYSTATS' 2019-2029 Occupational Outlook, and 2021 wage estimates are taken from the Occupational Employment & Wage Statistics (OEWS) program and KYSTATS' Labor Market Information Branch.

Kentucky Skills U: KY Skills U is Kentucky's adult education program and provides KYSTATS with data on adult student programs that help students to gain the academic skills and credentials they need to transition to postsecondary education, function productively in the workforce, and support their families.

Unemployment Insurance (UI): This system contains information on all wages and employment covered by the Kentucky Unemployment Insurance System. This is estimated to cover 90% of employment in Kentucky. Annualized wages are based on the Federal Fiscal Year (FFY), which runs from October 1st through September 30th. For instance, the 2018 FFY encompasses the time period of October 1, 2017 through September 30, 2018.

Dashboard - Historic Supply:

Five-Year Historic Supply by Local Workforce Area (LWA)

Total Credentialed People - The total number of people who earned credentials within each area and region. People receiving more than one credential are only counted once in each geographic region (LWA and county), and are only counted once in each credential category. The difference in the state-level aggregates and LWA aggregates results from certain

credentials being attributable to the Commonwealth as a whole, but not to a specific county. People receiving credentials in multiple years are counted once in each year they received any number of credentials.
Data Source: CPE
Data Elements: KPEDS_Degree*: degreerank, KPEDS_DegreelevelShortDesc, KPEDS_Degree_Year, KPEDS_Institution, KPEDS_Major1_CIP, KPEDS_Major1.*

Total Credentials - This option shows the total number of credentials issued within each area and region. People receiving more than one credential are counted multiple times – each credential is counted in each geographic region and also each credential category.
Data Sources: CPE, KDE, SKILLS U
Data Elements: KPEDS_Degree*: degreelevelshortdesc 'Certificate where KPEDS_Degree.kpeds_degreelevelshortdesc in ('Cert < 1 Yr','Cert 1-2 Yr','Cert 2-4 Yr B','Cert 2-4 Yr') 'Diploma' where KPEDS_Degree.kpeds_degreelevelshortdesc in ('Diploma 1-2 Yr','Diploma 2-4 Yr')'Associate's where KPEDS_Degree.kpeds_degreelevelshortdesc in ('Associate') 'Bachelor' where KPEDS_Degree.kpeds_degreelevelshortdesc in ('Bachelor','Post-Bacc Cert') 'Master' where PEDS_Degree.kpeds_degreelevelshortdesc in ('Masters','Post-Mast Cert','Specialist','Inst-Def Grad Cert') or kpeds_degreelevelshortdesc like ('Master%') 'Doctoral' where KPEDS_Degree.kpeds_degreelevelshortdesc in ('Doct Other','Doct Prof','Doct Rsch/Schl','PostDoc Cert'), degreerank, KPEDS_Degree_Year KPEDS_Institution:* TEDS_IndustryCerts: *TEDS_IndustryValid = 'Yes';* IC_AnnualPerson: *IC_ReportedGraduated = 'Y'* or AE_Data.*AE_HSDiplomaGED='GED'*

Major or Industry Certification - The total number of credentialed People or Credentials within a Major or Industry Certification.
Data Source: CPE
Data Elements: KPEDS_Degree*: KPEDS_Degree_Year, KPEDS_Institution, KPEDS_Major1_CIP,* TEDS_Enrollment*: DistNo;* TEDS_IndustryCerts*; TEDS_IndustryValid;* AE_Data*; AE_HSDiplomaGED; AE_County*

LWA - Locations are based on where the credential was earned. Postsecondary degrees are based on the institution location; Career & Tech Ed Certificates and High School Diploma, are based on the location of the district where the credential was earned; and GED earners, the location of the Adult Education facility (SKILLS U) is used. Counties are used to determine the LWA. See the link for a map that displays all counties within each LWA. Those without a known location have been excluded from Historic Regional Supply. Individuals without a known location are those with a High School Diploma or CTE certificate. Most of these individuals earned a GED at correctional facilities across Kentucky.
Data Sources: CPE, KDE, SKILLS U
Data Elements: KPEDS_Institution: *CensusTract;* IC_AnnualPerson: *IC_ReportedGraduated, DistNo;* TEDS_Enrollment*: DistNo;* TEDS_IndustryCerts*; TEDS_IndustryValid;* AE_Data*; AE_HSDiplomaGED; AE_County*

Credential Level by Major Group Grid

Distribution of Credentials within Major Groups - Percentage of credentialed People or Credentials within Major Groups. See Appendix D for a chart of the classification of academic majors into Major Groups.
Data Source: CPE

Data Elements: KPEDS_Degree*: KPEDS_DegreelevelShortDesc, degreerank, KPEDS_Degree_Year, KPEDS_Institution, KPEDS_Major1_CIP 'Arts and Humanities' where left (KPEDS_Major1_CIP, 2) in ('05','16','23','24','30','38','39','50','54')*
'Business' where left (KPEDS_Major1_CIP, 2) in ('09','10','52')
'Health' where left (KPEDS_Major1_CIP, 2) = '51'
'Education' where left (KPEDS_Major1_CIP, 2) = '13'
'Social and Behavioral Sciences and Human Services' where left (KPEDS_Major1_CIP, 2) in ('19','22','25','31','42','44','45')
'STEM' where left (KPEDS_Major1_CIP, 2) in ('01','03','04','11','14','15','26','27','28','40','41')
'Trades' where left (KPEDS_Major1_CIP, 2) in ('12','33','43','46','47','48','49')

Distribution of Specific Majors and Certifications – the count of credentialed people and credentials for 6-digit CIP codes in both postsecondary and career and technical education industry certifications.
Data Source: CPE, KDE
Data Elements: KPEDS_Degree*: KPEDS_DegreelevelShortDesc, degreerank, KPEDS_Degree_Year, KPEDS_Institution, KPEDS_Major1_CIP,* TEDS_IndustryCerts, degreerank

Dashboard – Employment Outcomes:

<u>Employment Outcomes by Credential Level and Major Group</u>

Percentage Employed 1, 3, and 5-years after graduation - Percent Employed in KY one/three/five years after graduation – are determined through CPE degree information, with each individual assigned the highest acquired credential, and affiliated degree year, during the given timeframe. Any individuals re-enrolled in an in-state postsecondary institution, as determined by CPE data, during the appropriate FFY are excluded: reenrolled individuals are excluded from both the base graduation rate and the employed rate. Individuals are considered employed if they acquire any in-state UI covered wages during the requisite FFY.
Data Sources: CPE, UI
Data Elements: UI_Wages_Annualized*: FFY, sumWages;* KPEDS_Degree*: degreerank, KPEDS_Degree_Year, KPEDS_Institution, KPEDS_CIP_2Digits*

Median Wage 1, 3, and 5-years after graduation - Median Wages are calculated 1-year, 3-years, and 5-years after graduation year and are determined through CPE degree information, with each individual assigned the highest acquired credential, and affiliated degree year, during the given timeframe. Total individual wage is determined by summing all in-state UI covered wages acquired by an individual during the appropriate FFY. Individual wages are used to calculate median wages by credential level, institution, and major. Any individuals re-enrolled in an in-state postsecondary institution, as determined by CPE data, during the appropriate FFY are excluded.
Data Sources: CPE, UI
Data Elements: UI_Wages_Annualized*: FFY, sumWages;* KPEDS_Degree*: degreerank, KPEDS_Degree_Year, KPEDS_Institution, KPEDS_CIP_2Digits*

Employment in Key Sectors - Percentage of employment by major group - Key sectors of employment were assigned by using the sector in which each completer earned their highest wage during their highest earning quarter in FFY 2018. The chart on key sectors (hovering

over the wage bars or employment percentages) of employment are created using groupings of the 2-digit North American Industry Classification System (NAICS) codes - the federal standard in classifying business establishments. Key sectors identified are developed by KWIB in collaboration with Economic Development: Transportation and Logistics (48, 49), Construction and Trade (23), Business and IT Services (42, 51, 52, and 54), Health Sciences (62), Advanced Manufacturing (31-33), and Non-Key sectors (All other NAICS).
Data Source: UI
Data Element: UI_Wages, *MajorIndustry, NAICS, FiscalYear*

Dashboards – Future Demand and Specific Occupation:

Five-Year Future Demand (Occupational Change & Exits)

Future Openings/Projected Job Openings - The total number of job openings expected to have been produced from 2020 to 2025. In the 2019-2029 Occupational Outlook, total job openings are presented as the sum of openings produced by occupational change, occupational exits (i.e. worker retirements, or other exits from the labor force), and occupational transfers (worker migration from one occupation to another). To produce the estimates shown in this report, the portion of the openings in the long-term projections produced in the 2020-2025 projection period are assumed to be commensurate with the portion of occupations' employment change in the long-term projections occurring within the 2020-2025 period used here. This can be written as:
*((2025_projected_employment-2020_base_employment) / (2029_projected_employment-2019_base_employment)) * (total_2019-2029_job_openings)*
Data Source: Original calculation, derived from values in 2019-2029 KY Occupational Outlook
Data Element: Projected Job Openings

Future Demand - Occupational demand, a metric calculated specifically for this report, is intended to represent the volume of total Job Openings that can be interpreted as a signal for educational planners re: the minimum number of total estimated job openings that Kentucky's education systems can reasonably be expected to produce newly-qualified workers to fill. Demand is calculated as the sum of Occupational Change and Exits (which are both calculated for the five-year projection frame used here, but are not published).
Data Source: Original calculation, derived from values in 2019-2029 KY Occupational Outlook
Data Element: Future Demand

Wage Type - The most current estimated annual entry-level, median, and experienced wages paid to workers in a given occupation. Entry-level Wage is 10th percentile, Median Wage is 50th percentile, and Experienced Wage is 90th percentile.
Data Source: 2021 state-level wage estimates are taken from the Occupational Employment & Wage Statistics (OEWS) program and Local Workforce Area estimates are from KYSTATS' Labor Market Information Branch.
Data Elements: Entry-level Wage, Wage, Experienced Wage

Future Demand (Occupational Change & Exits) by Median Annual Wage for Specific Occupations – Scatterplot Filters

Metric – Educational Skill Level - The level of educational attainment typically required for entry into an occupation. Occupational skill levels (only visible when viewing the dashboard at

the Specific Occupation detail level) are based on the BLS Education and Training Assignments by Detailed Occupation, 2020 (https://www.bls.gov/emp/tables/education-and-training-by-occupation.htm). The classifications used in this report appear as:

BLS Entry Level Education Level	Skill Level
Bachelor's Degree and Higher	High Skill
Postsecondary Below Bachelor's	Middle Skill
High School Diploma or Below	Low Skill

The Kentucky Office of Career and Technical Education (CTE), along with KYSTATS analysts, further cross-walked these assignments into three buckets. Occupations that require a high school diploma, but also require substantive Career/Technical training at the secondary level were moved to "Middle Skill" on recommendation of CTE as noted below:

SOC Code	Title	Education Needed for Entry Level Position	Skill Level
11-3071	Transportation, Storage, and Distribution Managers	High school diploma or equivalent	Middle
43-1011	First-Line Supervisors of Office and Administrative Support Workers	High school diploma or equivalent	Middle
47-1011	Supervisors of Construction and Extraction Workers	High school diploma or equivalent	Middle
47-2021	Brickmasons and Blockmasons	High school diploma or equivalent	Middle
47-2031	Carpenters	High school diploma or equivalent	Middle
47-2111	Electricians	High school diploma or equivalent	Middle
47-2152	Plumbers, Pipefitters, and Steamfitters	High school diploma or equivalent	Middle
47-2211	Sheet Metal Workers	High school diploma or equivalent	Middle
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	High school diploma or equivalent	Middle
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	High school diploma or equivalent	Middle
49-9041	Industrial Machinery Mechanics	High school diploma or equivalent	Middle
49-9071	Maintenance and Repair Workers, General	High school diploma or equivalent	Middle
51-1011	First-Line Supervisors of Production and Operating Workers	High school diploma or equivalent	Middle
51-4041	Machinists	High school diploma or equivalent	Middle
51-4121	Welders, Cutters, Solderers, and Brazers	High school diploma or equivalent	Middle
53-1021	First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand	High school diploma or equivalent	Middle

53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	High school diploma or equivalent	Middle
53-3021	Bus Drivers, Transit and Intercity	High school diploma or equivalent	Middle
53-3022	Bus Drivers, School or Special Client	High school diploma or equivalent	Middle
53-3033	Light Truck or Delivery Services Drivers	High school diploma or equivalent	Middle

Metric – Occupational Change - Occupational Change (previously referred to as Growth), is defined as the difference between Future and Current Employment. Rate of change used in the calculations of Future and Current Employment estimates represent the exponential rate of change needed for an occupation's employment to reach projected levels in the 2019-2029 Occupational Outlook from the base employment in the same report. Where *n* is the number of years in the projection period (10), this can be written as:

*Rate of change=(((2029_projected_employment/2019_estimated_employment)^1/n)-1)*100*

In this report, the intensity of Change is characterized by adjectives representing four classifications:

Adjective	Percent Change
Declining	<0%
Stable	0% to 6.99%
Growing	7% to 12.99%
Fast Growing	13%+

Metric – Work Experience - Related work experience typically required for entry into an occupation; Five years or more, Less than five years, None.
Data Source: BLS - Occupational Projections Data
Data Elements: Work Experience in a related occupation

Metric – On-the-Job Training - On-the-job-training typically needed to reach competency within an occupation.
Data Source: 2019-2029 KY Occupational Outlook
Data Element: Typical Training

Occupational Group - General Occupations are assigned according to 2-digit Standard Occupational Classification (SOC) codes. (First two digits)
Data Source: 2019-2029 KY Occupational Outlook
Data Element: SOC Code

Specific Occupations - Specific Occupations are assigned according to full 6-digit SOC codes.
Data Source: 2019-2029 KY Occupational Outlook
Data Element: SOC Code

Estimated Current Employment - Current (2020) employment represents the base (2019) employment in KYSTATS' 2019-2029 Occupational Outlook, matured with one year of exponential growth (see Occupational Change above).
Data Source: Original calculation, derived from values in 2019-2029 KY Occupational Outlook
Data Element: mtbase_emp

Future Demand - Occupational demand, which is a metric calculated specifically for this report, is intended to represent the volume of total Job Openings that can be interpreted as a signal for educational planners re: the minimum number of total estimated job openings that Kentucky's education systems can reasonably be expected to produce newly-qualified workers to fill. Demand is calculated as the sum of Occupational Change and Exits (which are calculated for the five-year projection frame used here, but are not published).
Data Source: Original calculation, derived from values in 2019-2029 KY Occupational Outlook
Data Element: Future Demand

Projected Job Openings - The total number of job openings expected to have been produced from 2020 to 2025. In the 2019-2029 Occupational Outlook, total job openings are presented as the sum of openings produced by occupational change, occupational exits (i.e. worker retirements, or other exits from the labor force), and occupational transfers (worker migration from one occupation to another). To produce the estimates shown in this report, the portion of the openings in the long-term projections produced in the 2020-2025 projection period are assumed to be commensurate with the portion of occupations' employment change in the long-term projections occurring within the 2020-2025 period used here. This can be written as:
*((2025_projected_employment-2020_base_employment) / (2029_projected_employment-2019_base_employment)) * (total_2019-2029_job_openings)*
Data Source: Original calculation, derived from values in 2019-2029 KY Occupational Outlook
Data Element: Projected Job Openings

Entry Level Wage - The most current estimated annual entry-level wages paid to workers in a given occupation.
Data Source: 2021 state-level wage estimates are taken from the Occupational Employment & Wage Statistics (OEWS) program and Local Workforce Area estimates are from KYSTATS' Labor Market Information Branch.
Data Element: Entry-level Wage

Median Annual Wage - The most current estimated annual median wages paid to workers in a given occupation.
Data Source: 2021 state-level wage estimates are taken from the Occupational Employment & Wage Statistics (OEWS) program and Local Workforce Area estimates are from KYSTATS' Labor Market Information Branch.
Data Element: Median Wage

Experienced Wage - The most current estimated annual experienced wages paid to workers in a given occupation.
Data Source: 2021 state-level wage estimates are taken from the Occupational Employment & Wage Statistics (OEWS) program and Local Workforce Area estimates are from KYSTATS' Labor Market Information Branch.
Data Element: Experienced Wage

Typical Educational Skill - The level of educational attainment typically required for entry into an occupation.
Data Source: 2019-2029 KY Occupational Outlook
Data Element: Typical Education

Work Experience - Related work experience typically required for entry into an occupation; Five years or more, Less than five years, None.
Data Source: BLS - Occupational Projections Data
Data Elements: Work Experience in a related occupation

On-the-Job Training - On-the-job-training typically needed to reach competency within an occupation.
Data Source: 2019-2029 KY Occupational Outlook
Data Element: Typical Training

Associated Work Skills from ONET - Data on Knowledge, Skills, Abilities, and Work Activities are from O*NET and are ranked by their standardized order of importance (This is a score between 0 and 100 and can be found at www.onetonline.org/help/online/scales). (These data are from "O*NET Online" by the National Center for O*NET Development. Used under the CC BY 4.0 license.)

Knowledge - Organized sets of principles and facts applying in general domains.
Data Source: ONET
Data Elements: Knowledge

Skills - Developed capacities that facilitate learning or the more rapid acquisition of knowledge.
Data Source: ONET
Data Elements: Skills

Abilities - Enduring attributes of the individual that influence performance.
Data Source: ONET
Data Elements: Abilities

Activities - General types of job behaviors occurring on multiple jobs.
Data Source: ONET
Data Elements: Work Activities

APPENDIX B: REDACTION RULES

Redaction Rules

KYSTATS follows strict redaction and suppression guidelines to ensure the privacy of all individuals. The following rules were applied to the KFSR report to redact or mask some of the data based on the small cell-size counts that could be used to identify individuals. In general, categories must have a base denominator of 10 to be present in the report. If two categories are exhaustive (ex: males and females) and either group has less than 10 students, both groups are redacted. All rules apply at the school, district, and state level. All graphs include data already presented in the report unless otherwise noted. If these data are redacted in the report, they are also redacted in any accompanying charts and graphs.

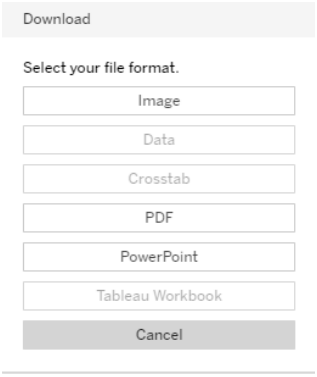
The principles outlined above apply to wage and projected employment metrics as well. Estimates for occupations having employment of 10 or fewer, as well as estimates that reflect a small aggregate number of employers, are redacted in the 2019-2029 Occupational Outlook as well as this report.

APPENDIX C: PRINTING

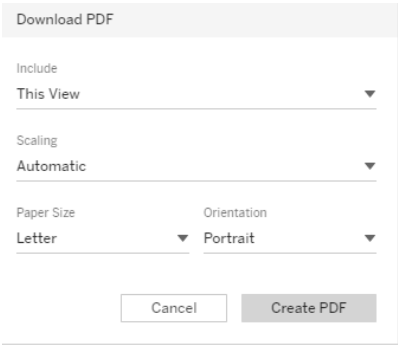
Printing - Download a dashboard to PDF

1. Click Download 

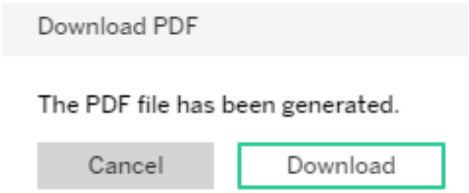
2. On the Download screen – click PDF



3. On the Download PDF screen. Set what you want to include, the scaling paper size, and orientation, **then click create PDF.**
   This View under Include, prints the current page.
   Specific sheets from this dashboard (the displayed page) allows you to select specific sheets
   Specific sheets from this workbook (select from all dashboards) allows you to select specific workbooks.



4. Once your PDF has been generated. Click **Download.**



APPENDIX D: CLASSIFICATION OF ACADEMIC MAJORS INTO MAJOR GROUPS

Major Group	2-Digit CIP Code	2-Digit CIP Family Title
Arts & Humanities	05	Area, Ethnic, Cultural, Gender, & Group Studies
	16	Foreign Languages, Literatures, & Linguistics
	23	English Language & Literature/Letters
	24	Liberal Arts & Sciences, General Studies & Humanities
	30	Multi/Interdisciplinary Studies
	38	Philosophy & Religious Studies
	39	Theology & Religious Vocations
	50	Visual & Performing Arts
	54	History
Business & Communication	09	Communication, Journalism, & Related Programs
	10	Communications Technologies/Technicians & Support Services
	52	Business, Management, Marketing, & Related Support Services
Education	13	Education
Health	51	Health Professions & Related Programs
Social & Behavioral Sciences & Human Services	19	Family & Consumer Sciences/Human Sciences
	22	Legal Professions & Studies
	25	Library Science
	31	Parks, Recreation, Leisure, & Fitness Studies
	42	Psychology
	44	Public Administration & Social Service Professions
	45	Social Sciences
STEM	01	Agriculture, Agriculture Operations, & Related Sciences
	03	Natural Resources & Conservation
	04	Architecture & Related Services
	11	Computer & Information Sciences & Support Services
	14	Engineering
	15	Engineering Technologies & Engineering-related Fields
	26	Biological & Biomedical Sciences
	27	Mathematics & Statistics
	28	Military Science, Leadership & Operational Art
	40	Physical Sciences
	41	Science Technologies/Technicians
Trades	12	Personal & Culinary Services
	33	Citizenship Activities
	43	Homeland Security, Law Enforcement, Firefighting & Related Protective Services
	46	Construction Trades
	47	Mechanic & Repair Technologies/Technicians
	48	Precision Production
	49	Transportation & Materials Moving