THE NEW POSSIBLE

Innovative Workforce Development and Skills Maps for Tompkins County

The COVID-19 Global Pandemic has affected our work, education, business, family and social lives in ways we could not have imagined.

The results of this project represent a significant partnership between the community and the research team. Together we've learned that the world has changed, and that we can and will adapt to the new possible.

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EXECUTIVE SUMMARY

The COVID-19 pandemic produced ongoing economic shocks to Tompkins County.
This report examines the pandemic's effects on the labor market, including the changing skills needs of employers, the availability of workers with those skills, and how existing skills can be adapted and "outskilled" to meet new needs. It makes recommendations for training and education agencies in this changed social and economic landscape. It provides skills maps that to guide job seekers, employers and training providers toward a share pledge based on the most current labor market information about high-demand occupations in post-pandemic Tompkins County. In this time of economic recovery, long-held assumptions need to be questioned and modified, and risky innovations will be necessary. Stakeholders cannot simply hope the economy will quickly recover and return to normal; a data-informed strategy is needed if success is to be achieved.

Decisions about how to respond and how to plan the future of the Tompkins County economy must be based on hard evidence. Cornell's School of Industrial and Labor Relations and P2C Solutions worked in partnership with the Workforce Development Board to provide the evidence base. Research was conducted on employer demands for skilled employees and the availability of skilled employees during the pandemic, with an eye toward the future.

Section 1 presents data collection methods.
First, the research team drew on 10 publicly available datasets from 6 sources. Second, to complement the Tompkins County statistics, additional first-person narrative and was gathered in the form of original qualitative data from 33 supply- and demand-side interviews. Third, many of the same questions were explored using a survey of 89 employers in the County. Finally, this report presents COVID-era best practices.

Section 2 presents a statistical portrait of the County's economy.
It examines trends in unemployment, labor force participation, and employment levels as well as disparities in unemployment and job quality. Headline unemployment figures, labor force participation, and employment levels obscure the County's continued unusually high number of weekly unemployment insurance claims and wide disparities that are increasing because of the pandemic. Before the pandemic, people of color were more likely to be unemployed, disproportionately working in jobs paying less than a living wage, and overrepresented in the occupations most vulnerable to workplace closures and layoffs. These realities are more so now. An equitable and inclusive strategy that targets high-quality jobs is required.

Section 3 presents the qualitative interview data.
Included are the dynamics of different industries, challenges employers face in obtaining the skills they need from employees, and opportunities to address the challenges facing employers and jobseekers through the workforce development system. It discusses expanding areas of employment, distinguishing between recovering service industries, new COVID-era jobs, and other areas of expansion that may be "good" jobs. It then considers the County's infrastructure problems that frustrate jobseekers and employers, including transportation, internet, and childcare. Then it sketches out three areas where the workforce development system can have a direct impact: job quality, working from home, and employability skill sets. Finally considered are the structure and services of the workforce development system itself.

Section 4 presents findings from the employer survey.
It confirms that some of the hardest-hit industries and occupations are indeed coming back and will be hiring throughout 2021, but that employers continue to struggle to recruit staff, in part because of the scarcity of formal qualifications and certifications, but also because of low pay and the "fear factor" of working outside of home during a pandemic. It finds that the vast majority of current job postings are for in-person work. But it also finds that employers could use help for "equitable hiring, work retention, wage progression, and career advancement" as well as defining a "good job."

Section 5 identifies the industries and occupations that are growing and shrinking.

The growing "good job" occupations are:

(1) in an industry with forecasted above-average growth through 2026 in the Southern Tier;

(2) classified as having a "Bright Outlook" based on ten-year BLS projections through 2029;

(3) ones with a median wage at or above the Tompkins County living wage of $15.37 per hour; and

(4) not in an occupation classified as highly susceptible to COVID-related job or income losses or other economic shocks.

These occupations are listed in table 14 without comment so that the County can, through an inclusive and democratic process, decide which ones to target. Lastly, this section examines the education levels and skills profiles of workers in the "vulnerable" industries that have shed jobs.

Section 6 presents data-informed recommendations for Tompkins County.

- First, improving communication and coordination across the workforce development system through collective impact would improve its ability to innovate.

- Second, developing a compendium of short-term courses for employers and job seekers that address specific skills needs as the economy emerges from the pandemic.

- Third, launching entry-level jobs could be stabilized with a Good Jobs Initiative that draws on new and emerging practice of businesses, employees and workforce development professionals in defining a "good job" and supporting newly-hired workers.

- Fourth, services could be improved through human-centered design and innovation.

- Fifth, the National External Diploma Program, already in place at TC3, should be expanded.

- Sixth, the County could better harness its concentrations of wealth and power through an Anchor Institutions Forum in which our local anchors celebrate their successes and learn from peer institutions that have strategically supported the development of their surrounding areas.

- Seventh, workforce development should make racial equity a higher priority.

- Eighth, workforce development should be designed and delivered in a way to facilitate the growth of green jobs.

Section 7 outlines the structure for development of a new employment and skills strategy.

The appendices present more information about the research methods and findings of this report.

SECTION 1
Introduction: Research Questions and Methods

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The COVID-19 pandemic has been, and continues to be, a major shock to the economy of Tompkins County. Before the pandemic, employers struggled in a tight labor market to recruit skilled workers, and large numbers of job seekers faced severe barriers to employment. During the pandemic, recruitment of skilled employees and the number of barriers prospective employees faced intensified and, in many cases, multiplied. In particular, many workers with childcare/parent care responsibilities or in households with members that are particularly vulnerable to coronavirus are reluctant to leave their homes for work. At the same time, employer skill requirements continue to evolve and change. The pandemic hit some industries and occupations much harder than others, and the increased probability of working from home requires digital literacy skills that many simply do not have. The pandemic has also further exposed disparities within the workforce by age, race and gender. This introduction outlines the research questions and the methods used to address them.

1.1   The Labor Market Impacts of the Pandemic

Globally, the COVID-19 pandemic affected different industries and demographics unevenly. At the beginning of the pandemic, employers in hospitality, food, beverage, and some retail, closed and/or laid off the vast majority of their workers, whereas other industries continued operating on a work-from-home (WFH) basis or as essential services. McKinsey consultants predict that employment levels of US women are unlikely to return to pre-pandemic levels before 2024, while for men it is 2023. For workers with less than a high-school education and earning below $24,000 per year, employment levels are unlikely to recover before 2025.[1] Given the strong correlation between race/ethnicity and earnings,[2] disparities in the labor market are amplified by the pandemic.

Within the County, what are the percentages and numbers of jobs lost since January 2020 and what job losses or gains can be expected in 2021? Which industries and occupations have been most affected? How much of an increase has there been in working from home and which industries and occupations have shifted to remote/work-from-home models? How does Tompkins County compare to the rest of NY State, the US, and the world, in terms of the extent and kinds of job losses, and the kinds of jobs that have been retained or expanded? Which of these changes are temporary, and which are likely to be permanent?

1.2   Changing Skills Needs of Employers (2020-21)

Employers' skills requirements constantly change and obtaining skilled workers is often difficult. During the pandemic, the skill requirements of some employers changed due to the transition to working from home, the creation of new positions, the expansion of others, and pandemic-related changes to work organization. "Teleworkable"[3] jobs have been more resilient during the pandemic.[4] They also tend to pay more[5], are conducive to the employment of people with disabilities,[6] and allow workers to accept

jobs in other cities without moving.[7] Employers' most common approach to obtaining new skillsets is hiring, but redeploying, upskilling, and outskilling existing workers are also commonly observed worldwide.[8]

How do COVID-era changes to industries and workplaces alter employer skills needs? How do the skills requirements of expanding occupations and industries (such as green jobs) differ from those that are declining? Which jobs shifted to WFH? How does WFH affect skill requirements? What kinds of training do employers need to respond to demands for racial justice? Which training providers supply the most relevant skills in this context and how relevant is on-the-job training or other paid forms of apprenticeship? How much education and/or training is required? Are these "good jobs" (e.g. stable, unionized jobs that pay a living wage)? How much demand is there for them during the pandemic, and in the future? Are they considered 'essential'? What are the jobs like in the main industries and occupations affected by the pandemic and targeted by Ithaca Area Economic Development's (IAED) Economic Development Strategy (i.e. the "traded" sector, mainly education and manufacturing)?[9]

1.3   Availability of Worker Skills (2020-21)

Normally a sudden increase in unemployment translates into an increase in available skilled labor, but during the pandemic, when many workers are ordered to stay at home, the situation is different. Unpaid household work increased with the closure of schools and daycare, and the pandemic has not changed the fact that in most households, women do the majority of housework and childcare.[10] Job seekers have also had to work around other pandemic-era constraints and limits to availability, such as their family members' vulnerability to COVID-19.

How do these changes affect the availability of worker skills? Are employers having difficulty retaining workers who are working from home while also doing unpaid work caring for family members? Which workers are in occupations vulnerable to job and income losses during the pandemic, and what are their skills profiles? Can workers in declining job sectors and occupations be quickly "outskilled" to enter other, expanding fields?

1.4   COVID-Era Best Practices From Elsewhere

What is being done elsewhere during the COVID crisis to tackle the challenges discussed in this report? The research team scanned existing or emerging practice to identify COVID-era best practices in two areas:

Promoting racial justice and addressing racial disparities. Workforce development can address disparities by easing often difficult transitions to work and overcome barriers to high-quality jobs. One national study, however, shows that Black service users rate their experiences as worse than average in terms of learning about programs, preparing applications, finding employment, and entering or re-entering the workforce.[11] The National Skills Coalition recommends addressing racial disparities using targets and accountability, partnerships, training investments, and reduced restrictions to public assistance.[12] Focus needs to be put on how workforce services can be re-designed to make the labor market more inclusive.

Enabling the transition to a low-carbon economy. Layoffs in high-carbon industries and rapid hiring in green jobs both pose challenges and the workforce development system should be adaptable to help both businesses and employees navigate the change. This is not as easy as it may sound, however, since high-carbon industries are more likely to be unionized, family-supporting jobs, with differences in the geographical location and skill requirements of the work.[13] Tompkins County is committed to the transition to a low-carbon economy with good jobs.[14] How is this aspiration turned into a reality?

1.5   Research Methods

In any emergency, decisions must be made quickly, while the publishing of labor market data lags behind, and the same underlying data can be used to justify different decisions[15] which can pose challenges to immediately reading a one-county area like Tompkins County. This research is a combined understanding which draws on 3 data sources: 10 publicly available datasets from 6 sources, 33 qualitative interviews, and a survey of 89 employers.

Statistical data. All person- and occupation-level data were obtained from the U.S. Census Bureau's most recent American Community Survey (ACS) Five-Year Public Use Microdata Sample for 2015-19.[16] Records from ACS were joined to data from the current O*NET database, which includes skill requirements,[17] a dataset that identifies occupations vulnerable to COVID-related mass layoffs and workplace closures;[18] and data that classify jobs on whether they can be done on a work-from-home (WFH) or remote basis.[19] Next, industry- and economy-level data for Tompkins County and New York State were obtained from the Bureau of Labor Statistics (BLS) and New York State Department of Labor. Additional industry-specific jobs data were obtained from the U.S. Census Longitudinal Employer-Household Dynamics program. Appendix A describes the data sources, Section 2 presents the statistical portrait of the labor market, and Section 5 considers future developments.

Qualitative interviews. In partnership with the Tompkins County Workforce Development Board, the researchers developed a list of topics to be explored using open-ended questions. Respondents included employers on the demand side, education and workforce development organizations on the supply side, experts who could comment on both from business, labor, philanthropy, as well as service users. These 30- to 90-minute interviews took place between November 2020 and January 2021. The researchers systematically categorized statements using MAXQDA software. Appendix B lists the topics explored in the interviews, and the findings are discussed in Section 3.

Employer survey. The research team developed the survey questions in partnership with the Workforce Development Board. After programming the survey into Qualtrics, the team received help from the Tompkins Chamber of Commerce, Ithaca Area Economic Development (IAED), the Tompkins County Workers Center, the Tompkins County Human Services Coalition, and the Tompkins County Workforce Development Board to source responses. Employers had 10 days to respond. The questions are listed in Appendix C, and findings presented in Section 4.

SECTION 2
A Statistical Portrait of the Tompkins County Economy

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2.1   Unemployment and Labor Force Participation

The most common indicator used to evaluate economic health during the COVID-19 pandemic is the headline unemployment rate published monthly by the Bureau of Labor Statistics (BLS, a unit of the United States Department of Labor)[20]. State and regional updates arrive a few weeks after that national update.[21] The unemployment rate "measures the share of workers in the labor force who do not currently have a job but are actively looking for work. People who have not looked for work in the past four weeks are not included in this measure."[22] Changes in the unemployment rate can come from mass layoffs leading to larger numbers of job seekers (which increase the numerator) or from a shrinkage of the labor force due to people abandoning their job search (which reduce the denominator).

A decline in the unemployment rate during an economic crisis does not necessarily mean that people are finding work. Consider that the statewide unemployment rate for New York in August 2020 was 12.5%, down from the peak COVID-19 level of 15.9% the month before. In what looked like a continuation of this "good" news, the statewide unemployment dropped to 9.7% the following month (September 2020), the first time in half a year that unemployment fell below double digits. During this time, however, the total number of New Yorkers with jobs actually *fell* by nearly 40,000 between August and September. Unemployment dropped because the statewide labor force experienced a roughly 340,000-person reduction in size.[23] As the pandemic raged on, jobless people decided to stay in the safety of their homes, with many facing bleak prospects on the job market and/or caring for members of their households.

In Tompkins County, as in New York State, the unemployment rate experienced an unprecedented shock with the onset of the pandemic in April 2020, tripling from 3.5% to 10.2% in the County and increasing nearly fourfold – from 4.1% to 15.3% – statewide. The rates fell slightly in May 2020, climbed for two consecutive months in June and July, and have been trending mostly downward ever since. Figure 1 plots the unemployment rate *and* the relative size of the labor force for the state (left panel) and County (right panel) for the past two years (January 2019 through December 2020). Although the shape of the County's unemployment curve is similar to that of the state, the County's increase was less severe, and its movement back toward pre-pandemic levels much faster. The County's December 2020 unemployment rate (not seasonally adjusted) was 4.3%, just a half a percentage point ahead of where it was in January 2020 (3.8%).

Figure 1. Unemployment and labor force participation rates in New York State and Tompkins County, January 2019 – December 2020

UNEMPLOYMENT RATE (%)

LABOR FORCE PARTICIPATION (%)
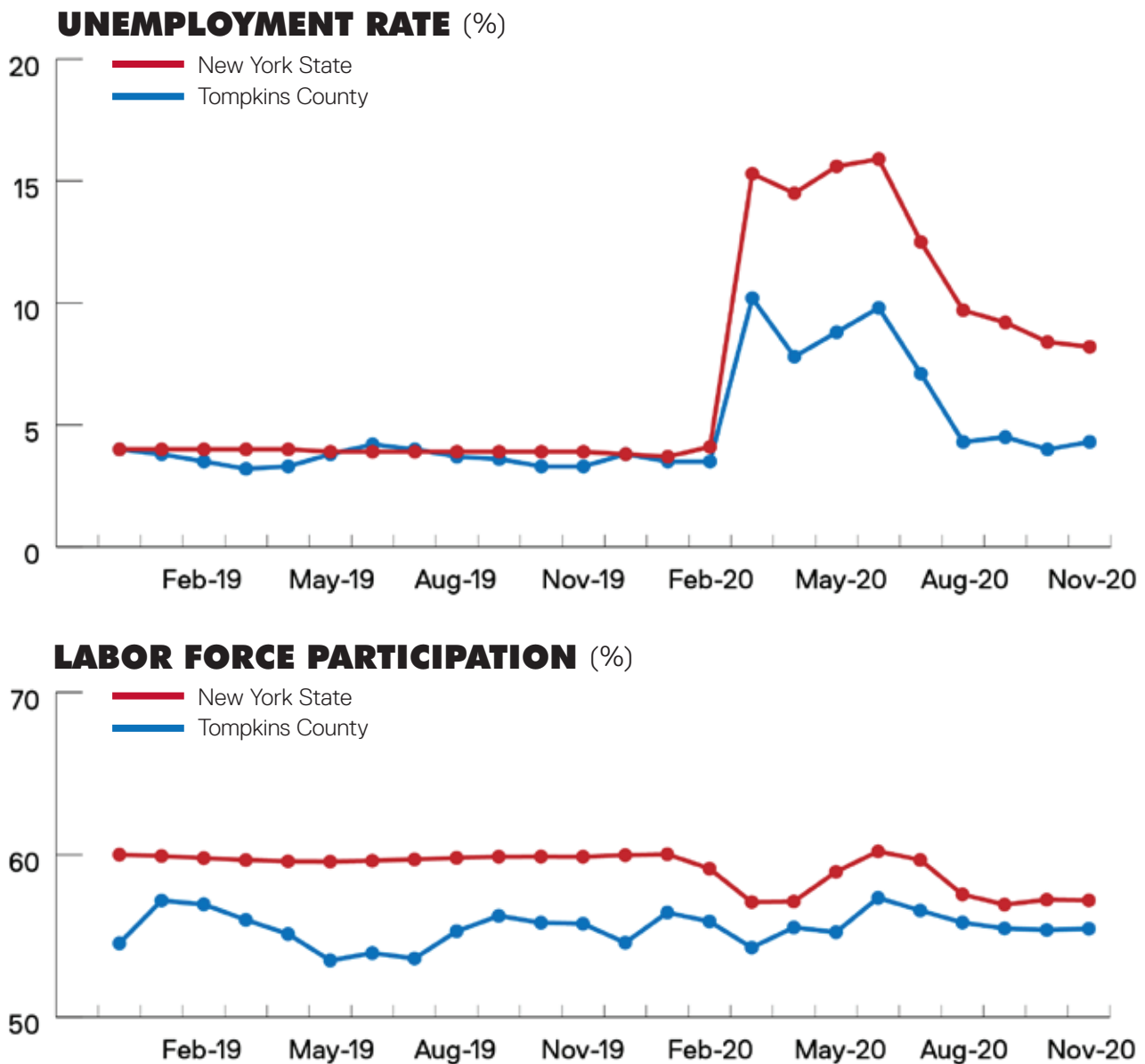
A similar story holds for the relative size of each place's labor force.[24] Labor force participation in Tompkins County (bottom right) exhibits all the signs of a region where higher education is the dominant industry. Unlike the relatively steady levels of pre-pandemic labor force participation statewide (bottom left), Tompkins County's labor force fluctuates up and down throughout the year, and peaks in fall and spring, when colleges and universities are in session. During semesters, faculty, staff, and students are actively employed in the labor force, and during summer and winter breaks many leave the area (e.g., students return to their permanent addresses).

Compared to New York State, labor force participation in Tompkins County is low and below average. Prior to COVID-19, the labor force participation rate hovered around 60% statewide, but in April 2020,

it fell to over 57% of the civilian noninstitutional population (16 years or older),[25] and after a brief uptick fell in October 2020 to slightly *under* 57%. The size of New York State's labor force has fallen steadily since July 2020, causing month-on-month decreases in unemployment. Employment rose by over 302,000 workers over that time, but roughly 480,000 fewer jobless persons were looking for work December 2020 compared to five months earlier. While 57% is a sign of crisis for New York State, the figure would be a high point in Tompkins County, which in 2019 had an annual average around 55%, with peaks between 55% and 57% in fall and spring and falls to between 53% and 54% during the rest of the year.

Because labor force participation is low in Tompkins County, it did not have as far to fall as in the rest of the state. Indeed, the pandemic barely registers in the graph on the bottom left of Figure 1. In five (May through September 2020) of the nine prime pandemic months (from April through December 2020), labor force participation in the County was actually higher than it was the corresponding months in 2019. The 2020 year-end labor force participation rate of 55.5% is similar to the same time in 2019 (55.8%) and ahead of where it was in January 2020 (54.6%).

In terms of unemployment and labor force participation as just one indicator, Tompkins County is ostensibly returning to pre-pandemic levels of economic performance, and at a much faster pace than the rest of the state. Yet, qualitative interviews and the persistence of sustained high levels of unemployment insurance claims suggest otherwise.[26]

Figure 2. Total employment (jobs) in New York State (red) and Tompkins County (blue), January 2019 – December 2020

TOTAL EMPLOYMENT (all non-farm jobs, in thousands)
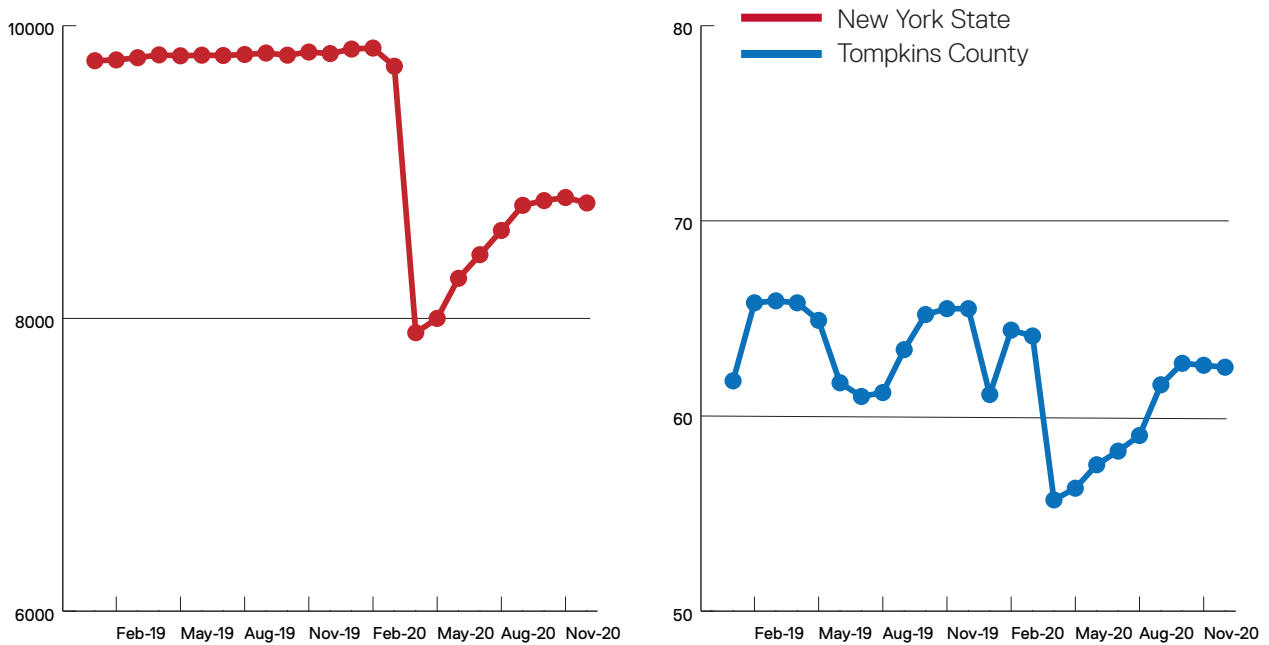
2.2 Employment Levels

The BLS publishes monthly data on total jobs (non-farm employment) in a given region, which can be broken out by industry.[27] Figure 2 plots total employment levels (in thousands) for New York State (left) and Tompkins County (right) over the past two years, from January 2019 through December 2020. Note that the two graphs have different vertical axes, due to the vast differences in magnitude in total jobs between the two places. The comparison to make is between the shapes of the curves, not their specific y-axis values.

As with labor force participation, statewide employment numbers were relatively steady pre-pandemic, hovering around 9.8 million jobs before falling off of a cliff with the April 2020 shutdowns. In Tompkins County, employment fluctuated between January 2019 and January 2019, averaging just under 64,000 jobs per month[28] and then fell dramatically; from March to April 8,400 jobs were loss, a month-over-month decrease of -13.1%. (The statewide average was -18.7%, with a loss of 1.82 million jobs from March to April 2020). The percentage of workers in these jobs who are commuters could be as high as 45%, as figure 3 shows.

Since April 2020, Tompkins County has been returning to pre-pandemic employment levels much faster than the statewide average. The 62,500 jobs reported in Tompkins County for December 2020 – while down from the December 2019 level of 65,500 – is still a net increase in jobs relative to January 2020. The January 2020 jobs total was 61,100, suggesting that, in spite of COVID-19, the local economy added jobs throughout the course of 2020.

Figure 3. Commuting Patterns in and out of the County

- 22,496
- 26,483
- 14,262
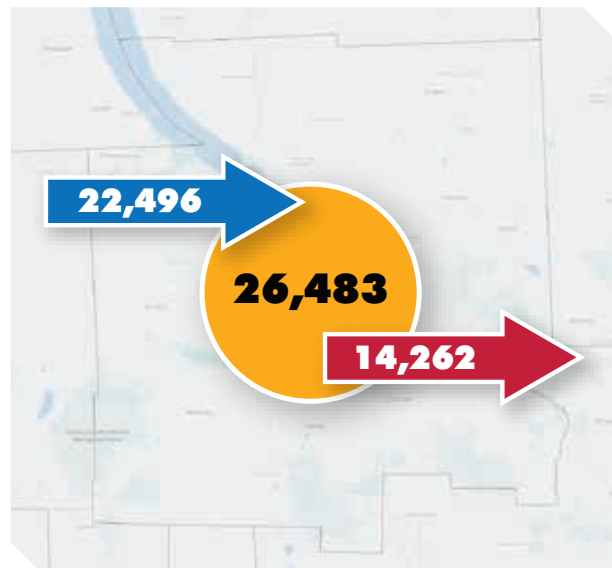
■ Employed and Live in Selection Area
■ Employed in Selection Area, Live Outside
■ Live in Selection Area, Employed Outside

This data is from the Longitudinal Employer-Household Dynamics dataset. https://lehd.ces.census.gov/data/

This finding puts Tompkins County somewhat ahead of the curve, as the rest of the country and the state are still well behind their January 2020 job totals.[29] However, these numbers should be treated with caution. Unlike national figures, county figures are not seasonally adjusted; adjusting the data to account for seasonal patterns of the economy may yield slightly different results.[30] More importantly, these headline statistics hide important disparities. Crises do not affect all persons, groups, industries, or places equally. Top earners are actually benefiting from COVID-19,[31] and there are important areas of jobs growth, such as private sector employers like Amazon and Walmart responding to increased demand[32] and the public health infrastructure of COVID-19 testing, contact tracing, and vaccination[33].

2.3   Disparities in Unemployment

Monthly BLS reports are constructed from samples that are too small to provide stable estimates of unemployment or employment rates for specific population subgroups in Tompkins County. However, from ACS data it is possible to compile unemployment data by race and gender, as well as for youth workers (age 16-24 years) and workers with disabilities. Table 1 presents these figures from (1) the 2005-09 five-year estimates and (2) the current 2015-19 five-year estimates to examine change over time.

Table 1. Unemployment for Selected Population Subgroups (ACS Five-Year Estimates)

	2005-09	2015-19	Percentage Point Change
Total Civilian Population	5.0%	3.8%	-1.2
Male	5.9%	4.8%	-1.1
Female	4.0%	2.8%	-1.2
Persons with disabilities	N/A	14.3%	N/A
Youth (ages 16-24 years)	8.7%	5.7%	-3.0
White (Not Hispanic or Latinx)	4.7%	3.5%	-1.2
Black or African American	7.1%	6.6%	-0.5
Hispanic/Latinx	7.2%	5.2%	-2.0
Asian	4.2%	3.3%	-0.9
All BIPOC	6.5%	4.6%	-2.0
Black-White Unemployment Gap	2.4	3.1	0.7
Hispanic/Latinx-White Unemployment Gap	2.5	1.7	-0.8
BIPOC-White Unemployment Gap	1.8	1.1	-0.8

Persons with disabilities, young workers, and workers of color all experience disproportionately high levels of unemployment. While unemployment rates fell uniformly over the last decade, disparities remain strong. Racial unemployment gaps between white and Hispanic/Latinx workers, white workers and Asian workers narrowed, but the gap between white and Black or African American workers widened. Persons with disabilities are nearly four times more likely than an average worker to be unemployed. Given disparities in the distribution of "vulnerable" job holders, disparities in employment have almost certainly increased because of the pandemic.

2.4   Disparities in the Recovery

While Tompkins County is on a clear path to recovery, local decision-makers should not see this as the full story, or opt for a "wait and see" approach. This is an opportunity to reimagine the regional economy. A crisis like the COVID-19 pandemic is a critical juncture which "cause[s] people and institutions to question long-held assumptions and to take risks associated with innovation."[34] This is the moment to reflect on whether the County's pre-pandemic "normal" is in line with the aspirations of businesses, non-profits, local residents and the local services infrastructure.

Disparities in the pre-pandemic "normal" have been amplified by the pandemic. In many places, the pandemic has led to a deepening of preexisting racial, gender, and economic disparities.[35] Insofar as one of the organizing principles of this project is a commitment to "Inclusion, Equity, and Justice, including advancement…for excluded groups,"[36] it is important to ask who the pandemic is most impacting and whether those effects reinforce preexisting disparities in the County. In the next section this report identifies the industries with the most job losses and shows who holds (or held) jobs in these industries.

Table 2. Employment Share by Industry, Pre-Pandemic and Current

Industry	Employment Share, Jan 2020 (%)	Rank, Jan 2020	Employment Share, Dec 2020 (%)	Rank, Dec 2020
All Jobs, Total	61,100	N/A	62,500	N/A
Education and Health Services	51.4%	1	53.0%	1
Local Government	9.2%	2	8.6%	2
Retail Trade	7.5%	3	6.7%	3
Leisure and Hospitality	6.9%	4	5.3%	6
Professional and Business Services	5.9%	5	5.9%	4
Manufacturing	4.4%	6	4.8%	7
State Government	3.9%	7	5.9%	5
Other Services	3.1%	8	2.6%	8
Financial Activities	2.5%	9	2.4%	9
Mining, Logging and Construction	2.0%	10	1.8%	10
Transportation, Warehousing, and Utilities	1.1%	11	1.1%	11
Wholesale Trade	0.8%	12	0.8%	12
Information	0.8%	13	0.6%	13
Federal Government	0.5%	14	0.5%	14

Employment in Tompkins County immediately prior to the pandemic, in January 2020, as reported by the BLS, was 61,100 jobs. As Figure 4 shows, more than half of those jobs (51.4%) were in the Education and Health Services sector, oftentimes referred to as "Eds and Meds." The next four largest industries were Local Government (9.2%); Retail Trade (7.5%); Leisure and Hospitality (6.9%); and Professional and Business Services (5.9%). The remaining ~19% of jobs were distributed across nine sectors, as shown on the left-hand-side of Table 2.

Two of the region's top five pre-pandemic industries – Retail Trade and Leisure & Hospitality – were hit particularly hard by the pandemic across the nation (i.e. they were associated with the greatest initial job losses and are still struggling to recover).[37] Table 3 summarizes BLS-reported job totals for Tompkins County for the first and last month of 2020 (January and December). Overall, the County experienced a small net gain in jobs (+1,400) over the course of 2020, but six industries experience net job losses (totaling -2,000).

The most significant job losses occurred in three of the region's previous top five industries:

> (1) Leisure and Hospitality (-900 jobs);

> (2) Retail Trade (-400); and

> (3) Local Governments (-200).

The relative employment share of each of those industries in the County's economy has shrunk – to the point where Leisure and Hospitality dropped out of the top five altogether.

Gains are due almost entirely to growth in

> (1) "Eds and Meds" jobs (+1,700) – which may include some new jobs but also reflects the oscillating employment patterns in higher education described above – and

> (2) State Government jobs. The latter is almost certainly related to aggressive pandemic-related hires in social and health service positions, including contact tracers, vaccine specialists, and benefits specialists.

The right-hand-side of Table 3 summarizes the net changes in jobs, showing the unequal distribution of job loss.

Table 3. Net Change in Jobs by Industry in Tompkins County,
January 2020 – December 2020

	Employment, Jan 2020	Employment, Dec 2020	Net Change
Mining, Logging and Construction	1,200	1,100	-100
Manufacturing	2,700	3,000	300
Wholesale Trade	500	500	0
Retail Trade	4,600	4,200	-400
Transportation, Warehousing, and Utilities	700	700	0
Information	500	400	-100
Financial Activities	1,500	1,500	0
Professional and Business Services	3,600	3,700	100
Education and Health Services	31,400	33,100	1,700
Leisure and Hospitality	4,200	3,300	-900
Other Services	1,900	1,600	-300
Federal Government	300	300	0
State Government	2,400	3,700	1,300
Local Government	5,600	5,400	-200

Figure 4. Industry Share in Tompkins County

Pre-pandemic (Jan 2020)
61,000 jobs
Regional economy of "Eds + Meds"

Current (Dec 2020)
62,700 jobs (net gain +1,600)

- Mining, Logging and Construction **1.8%**
- Manufacturing **4.8%**
- Wholesale Trade **0.8%**
- Retail Trade **0.8%**
- Transportation, Warehousing, and Utilities **1.1%**
- Information **0.6%**
- Financial Activities **2.4%**
- Professional and Business Services **5.9%**
- Education and Health Services **53%**
- Leisure and Hospitality **5.4%**
- Other Services **2.6%**
- Federal Government **0.5%**
- State Government **6.1%**
- Local Government **8.6%**

GROWTH
"Eds + Meds" (+1,800)
State Govt (+1,400)

LOSS
Leisure + Hospitality (-800)
Retail (-500)
Other Srvcs (-300)
Local Govt (-200)
Construction (-100)
Information (-100)
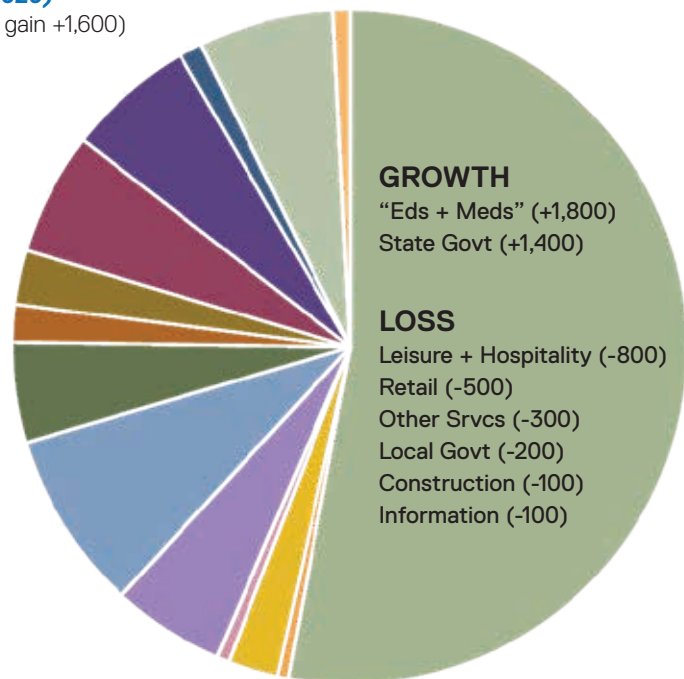
Vulnerable occupations in job-loss industries. To narrow in on the question of who has been most impacted by the pandemic – and who is most likely to still be experiencing economic hardship – the research team examined specific occupations in each of the six "job loss" industries. A dataset produced by researchers at New York University's (NYU) Furman Center classifies occupations in terms of their vulnerability to mass layoffs and significant income loss due to COVID-19. These NYU data were joined to person-level records from the American Community Survey (ACS) Public Use Microdata Samples (PUMS) for Tompkins County.

The research team then built a query to find workers working simultaneously in both (1) vulnerable occupations and (2) job loss industries. That query produced a universe of 6,534 workers, or about 14.2% of all workers living in Tompkins County.[38]

Table 4 displays the ten most common vulnerable occupations in the six industries that experienced net job loss in the County. These ten occupations account for 61% of the 6,534 workers identified as part of this exercise. The next step is to ask who holds those jobs. The next section breaks down County's "most affected workers" by race-ethnicity and wages.[39] Figure 5 presents common skills possessed by workers in these occupations. This suggests that top skills made more available due to job losses during the pandemic may include active listening, service orientation, persuasion, monitoring and speaking.

Table 4. Ten Most Common "Vulnerable" Occupations, in Tompkins County Industries that Experienced Net Job Loss

	# of jobs
Cooks, All Other	819
Cashiers	687
Waiters and Waitresses	594
Retail Salespersons	455
Chefs and Head Cooks	311
Carpenters	301
Construction Laborers	252
Recreation Workers	194
Childcare Workers	191
First-Line Supervisors of Food Preparation and Serving Workers	177

Figure 5. Common skills possessed by workers in vulnerable occupations

TOP SKILL

ACTIVE LISTENING
Service Orientation
Speaking
Monitoring - Persuasion

SKILL 2

SPEAKING
Active Listening
Service Orientation
Critical Thinking - Social Perceptiveness

SKILL 3

SPEAKING
Social Perceptiveness
Coordination - Service Orientation
Active Listening - Monitoring

SKILL 4

SOCIAL PERCEPTIVENESS
Service Orientation
Coordination
Service Orientation - Mathematics - Coordination

SKILL 5

COORDINATING
Social Perceptiveness
Critical Thinking - Service Orientation
Operation Monitoring - Time Management - Speaking

Racial and ethnic disparities

Workers of color tend to hold vulnerable jobs at a slightly higher rate than white workers across Tompkins County. This is critical to understanding where focus needs to be placed. One important test of a "good job", commonly used in the County, is whether that job pays a living wage. Alternatives Federal Credit Union currently calculates this at $15.37 per hour.[40] The $15.37 per hour threshold is applied to identify "living wage jobs" from among the set of vulnerable occupations that exist in industries which have lost jobs since the start of the pandemic.

As figure 6 shows, the jobs in Tompkins County most vulnerable to the pandemic are

(1) disproportionately held by workers of color, and

(2) predominantly low-wage (sub-living-wage) jobs.

Figure 6A. Likelihood of Holding a Vulnerable Occupation in Tompkins County, by Race-Ethnicity

RACE-ETHNICITY

% OF WORKERS IN VULNERABLE JOBS

	Asian or Pacific Islander	Black or African American	Hispanic or Latinx	Other or Multiple Racial Identities	White
Red	16.56%	16.50%	19.33%	10.11%	13.70%
Grey	83.44%	83.50%	80.67%	89.89%	86.30%

COUNT OF WORKERS IN VULNERABLE JOBS

	Asian or Pacific Islander	White
Grey	3,965	31,890
Red		5,061
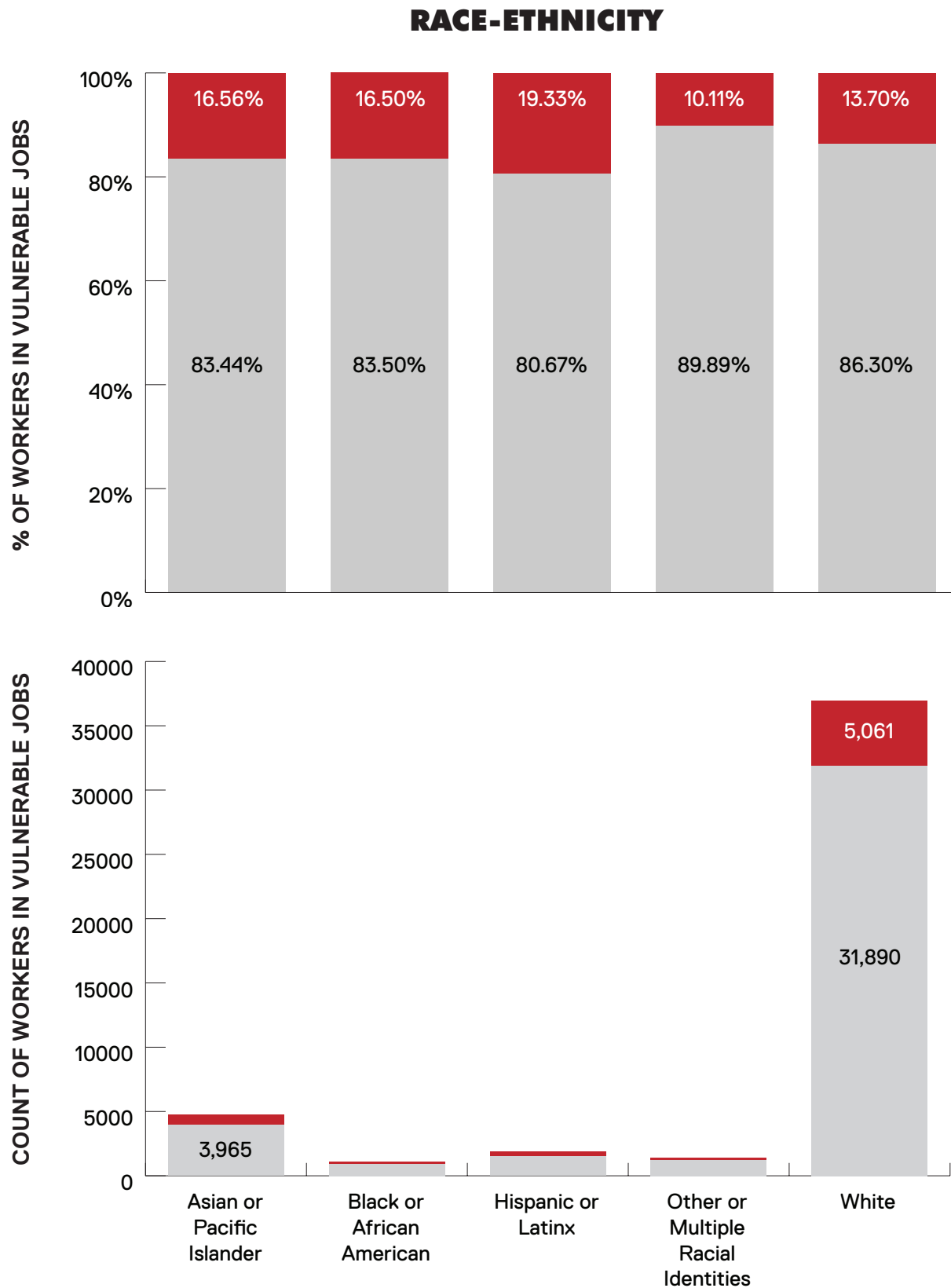
Figure 6B. Likelihood of earning below a living wage in a vulnerable occupation, by race and ethnicity
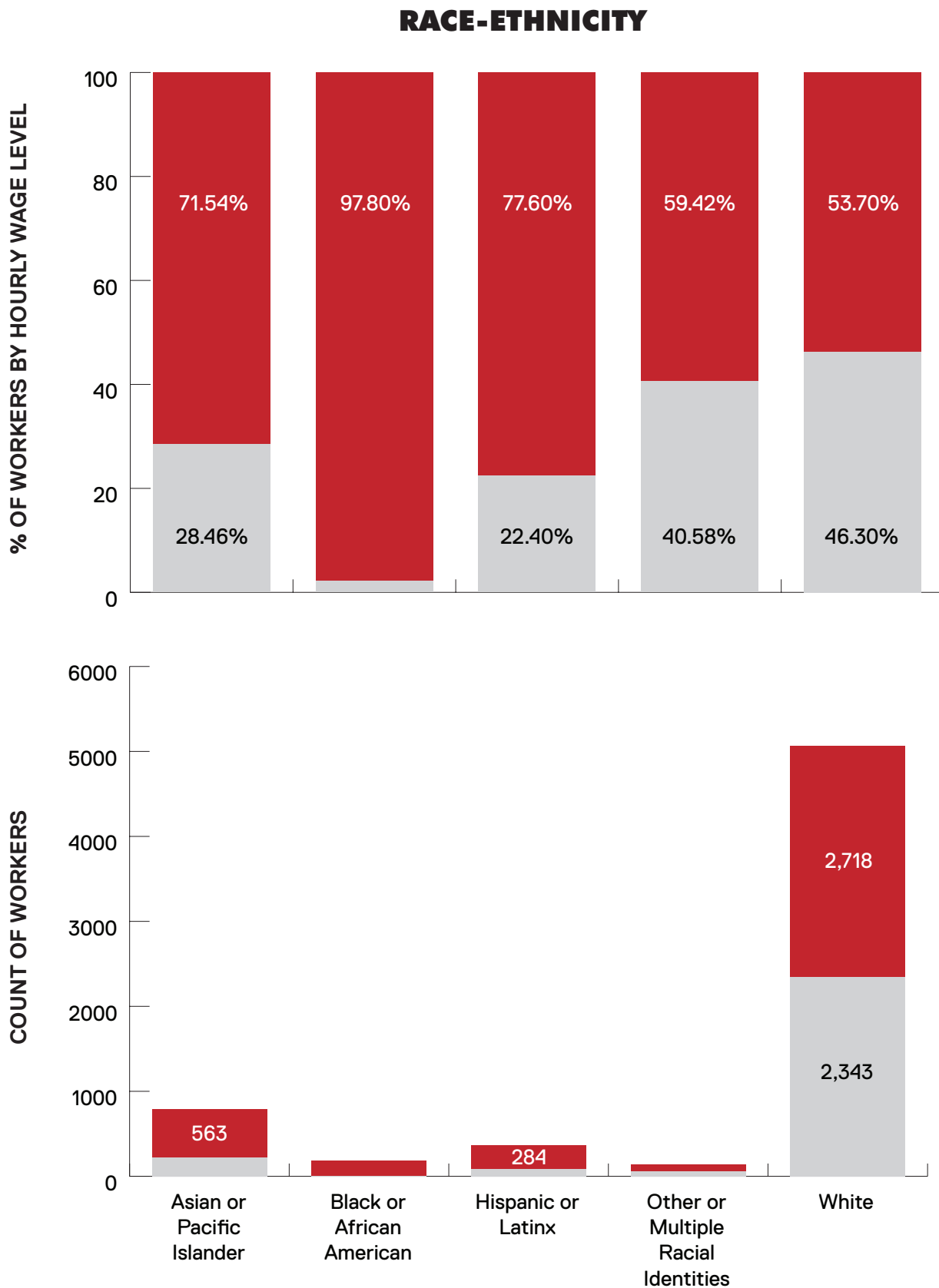
RACE-ETHNICITY

Figure 6C. Likelihood of earning below a living wage, by race and ethnicity, for all workers

RACE-ETHNICITY

% OF WORKERS BY HOURLY WAGE LEVEL

	Asian or Pacific Islander	Black or African American	Hispanic or Latinx	Other or Multiple Racial Identities	White
Red (above)	39.50%	68.90%	37.19%	55.60%	30.74%
Gray (below)	60.50%	31.10%	62.81%	44.40%	69.26%

COUNT OF WORKERS

	Asian or Pacific Islander	White
Gray	2,875	25,593
Red		11,358

Figure 6D. Where are the vulnerable jobs?

LEISURE AND FOOD SERVICE

- 5 - 138 Jobs/Sq. Mile
- 139 - 538 Jobs/Sq. Mile
- 539 - 1,204 Jobs/Sq. Mile
- 1,205 - 2,137 Jobs/Sq. Mile
- 2,138 - 3,337 Jobs/Sq. Mile
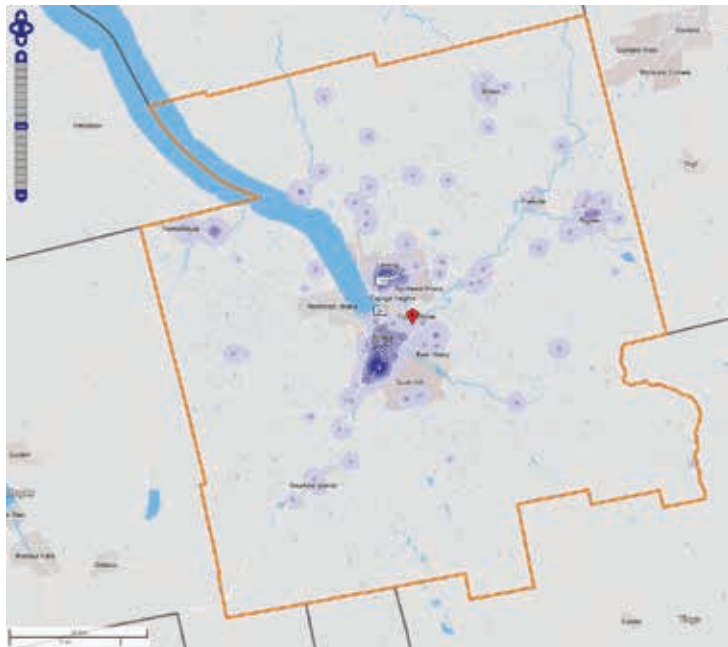
RETAIL TRADE

- 1 - 3 Jobs
- 4 - 33 Jobs
- 34 - 164 Jobs
- 165 - 519 Jobs
- 520 - 1,266 Jobs

Just 2,709 of the 6,534 identified vulnerable occupations (41.5%) pay (paid) workers a living wage of $15.37 per hour or more. By comparison, just 29.4% of all other jobs in Tompkins County (i.e., in less vulnerable occupations) pay below a living wage. While the majority of vulnerable job holders (of any race or ethnicity) are in positions that pay below a living wage, the situation is worse for workers of color.[41] Figure 6 displays data on racial and ethnic disparities in the County and geographic location, including:

- Likelihood of holding a vulnerable occupation (Figure 6A). Combined, Black, Indigenous, and Persons of Color (BIPOC) make up 19.8% of all workers, but 22.5% of workers in vulnerable occupations. Among BIPOC subgroups, Hispanic and Latinx workers have the highest likelihood (19.33%) of working in vulnerable occupations, followed by Asian workers (16.56%) and Black or African American workers (16.50%). By comparison, only 13.70% of non-Hispanic/Latinx White workers hold (held) jobs in vulnerable occupations.

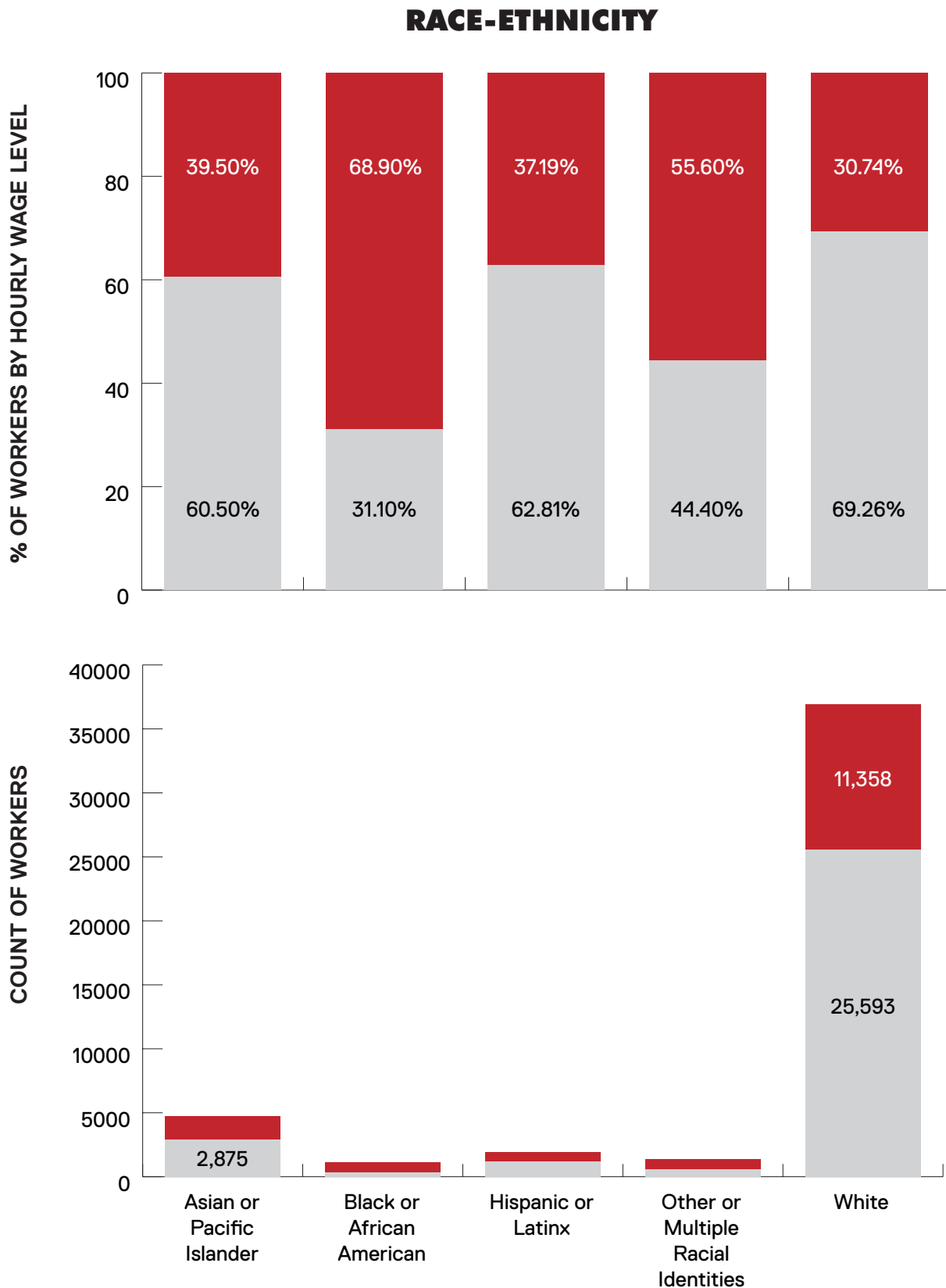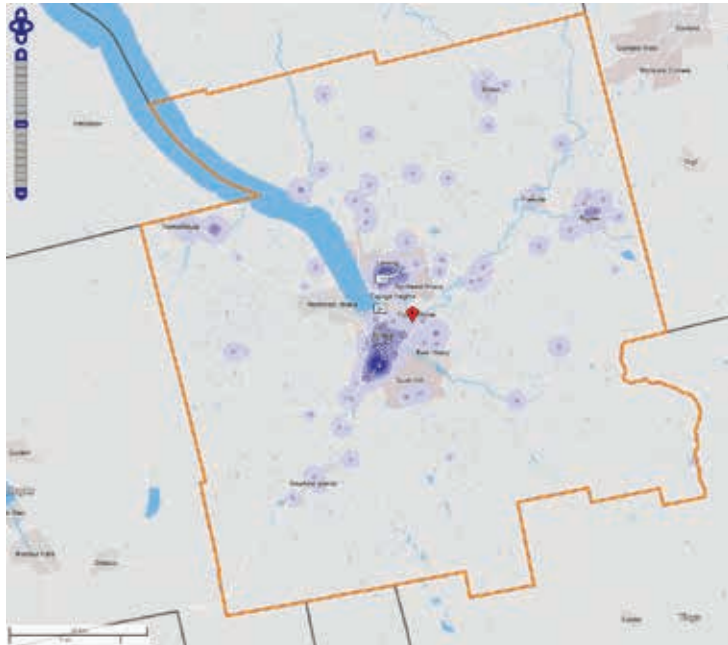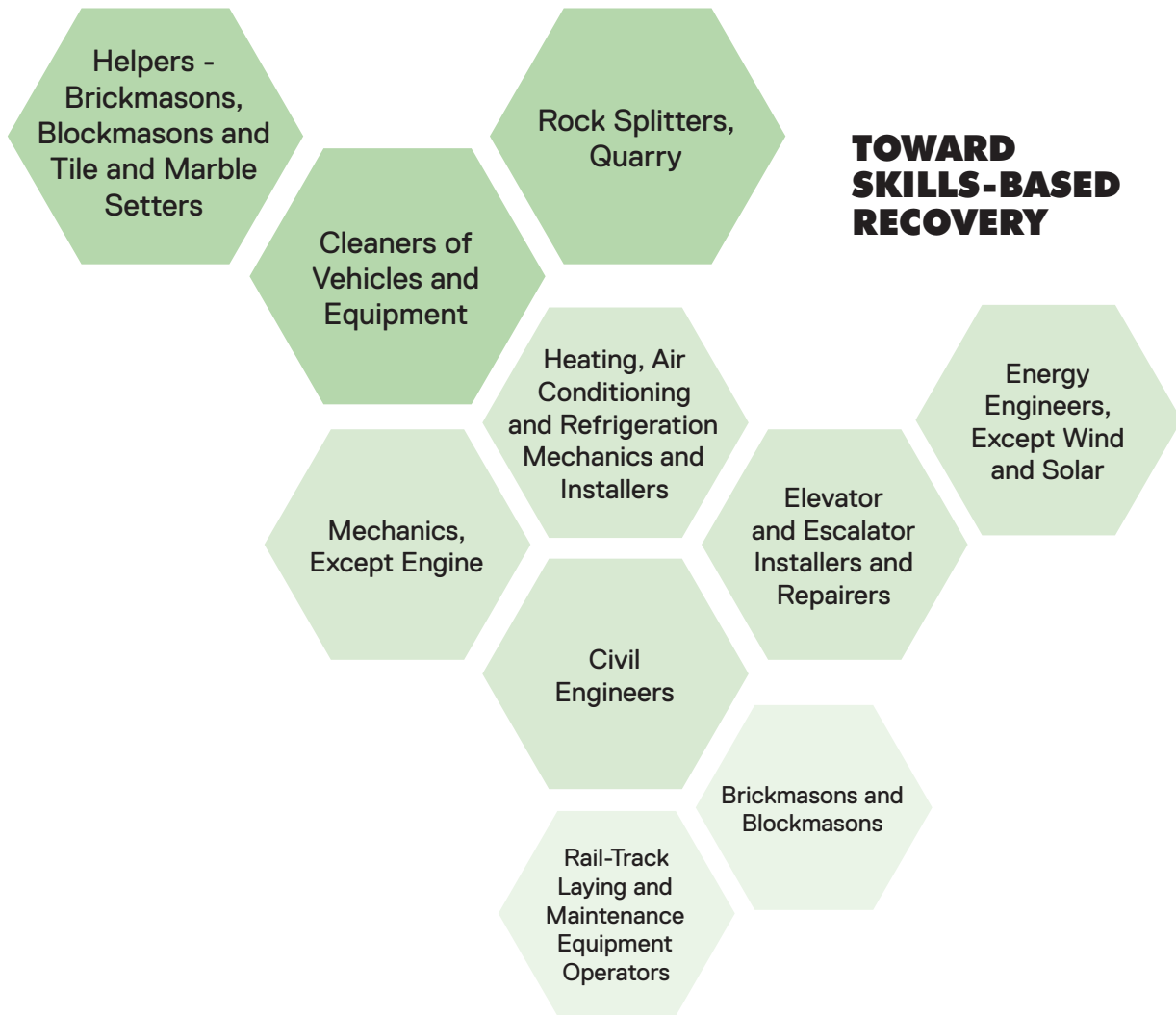- Likelihood of earning below a living wage in a vulnerable occupation (Figure 6B). The disparity here is extreme: compared to 53.70% of white workers in vulnerable jobs (and 58.54% of all vulnerable workers), 97.80% of Black or African American workers in vulnerable occupations earn below a living wage. The figure is 77.60% for Hispanic/Latinx workers, and 71.54% for Asian workers.

- Likelihood of earning a living wage in all occupations (Figure 6C). Among all job holders, roughly 69% of Black or African American workers earn below a living wage, compared to just 30.74% of white workers.

- Location (Figure 6D). The vast majority of these jobs are located in the City of Ithaca and Village of Lansing.

2.5 A Return to "Normal," or Something New?

The research found evidence of significant racial and ethnic disparities in both wages and presence in COVID-19-vulnerable jobs. BIPOC workers in the County are considerably more likely to hold sub-living-wage jobs than are white workers; and BIPOC workers are more likely to hold precarious jobs in industries that have suffered long-term job losses. Low-wage BIPOC workers, who were already at a disadvantage relative to their more affluent and white counterparts prior to the pandemic, are losing jobs at disproportionately high rates, putting economic security and mobility even further out of reach.[42]

Applying a "wait and see" approach to economic recovery under the assumption that the County's economy is quickly returning to "normal" will leave these workers behind. Underlying racial and economic disparities have continued to worsen throughout the pandemic, and a recovery may not reverse these losses. An "aggressively bring back lost jobs" approach of making targeted reinvestments into industries and establishments that experienced job loss is equally problematic. Figure 7 shows that the occupations in "Green Job Industries" are not necessarily the dominant ones in the local economy already. Local employers need assistance, but not in a way that accepts pre-pandemic disparities and economic vulnerabilities.

Figure 7. Occupations in "Green Jobs" industries (O*Net).

TOWARD SKILLS-BASED RECOVERY

Helpers - Brickmasons, Blockmasons and Tile and Marble Setters

Cleaners of Vehicles and Equipment

Rock Splitters, Quarry

Heating, Air Conditioning and Refrigeration Mechanics and Installers

Mechanics, Except Engine

Elevator and Escalator Installers and Repairers

Energy Engineers, Except Wind and Solar

Civil Engineers

Brickmasons and Blockmasons

Rail-Track Laying and Maintenance Equipment Operators

SECTION 3
Qualitative interviews

The statistical portrait of the County's labor market showed unevenness in industries, with some shedding large numbers of jobs. A low headline unemployment rate in early 2021 obscures these disparities and continuing abnormally high initial unemployment claims numbers. This does not include surrounding counties, where much of the workforce lives. The interviews with employers revealed a shared concern and difficulty in recruiting staff providing important insights into the mismatch between supply and demand.

3.1   Expanding Areas of Employment

Interviewees spoke to trends in each of their own industry sectors and businesses. Employment levels in technology, manufacturing, construction, and financial services were less affected than those in hotels, restaurants, and entertainment venues. Local government and nonprofits varied, some more affected by funding cuts than others; the same was true in higher education, with fewer furloughs made permanent at Cornell University and more significant reductions at Ithaca College. The largest retailers and healthcare providers experienced brief reductions in employment, but then recovered, as essential services. Appendix D lists the County's 15 largest employers, and areas of employment growth highlighted in interviews are as follows.

Temporary COVID-era jobs. Some areas of employment that expanded during the COVID era are likely to decline or disappear. Contact tracing, screening, testing, and vaccination are all areas where employers suddenly had to hire or redeploy staff to do new COVID-related work. It is unclear, however, how many of these jobs will remain: healthcare providers, for instance, may find ways to repurpose their testing facilities, but other jobs will fall away. Similarly, delivery work expanded during the pandemic, but will likely decline when in-person dining and grocery shopping resumes and shoppers are less reluctant to visit retail establishments. After the pandemic, some of these workers will be redeployed to their old jobs, like County probation workers repurposed as contract tracers, and others will lose their work.

Jobs in recovering service industries. Impacted by both by the exodus of 30,000 students from the area, the decline in travel and tourism, and the drop in downtown foot traffic due to working from home, many service industries that rely on low-wage workers are beginning to recover. This recovery is slow due to continued hesitancy of customers to return and the difficulty of outdoor dining in the winter. With students returning to Ithaca, the rollout of COVID-19 vaccines, and the return of workers to downtown offices, however, service-sector businesses plan to hire workers into the spring and summer of 2021. There may be some permanent changes in jobs, as with hotels that have cross-trained their staff to perform in multiple roles and that may have permanently eliminated certain amenities. In other cases, workers redeployed within their organizations may return to their previous positions.

Sustained growth in other sectors and occupations. Interviewees highlighted several additional areas of current expansion, some of which will continue into the future. Many of the kinds of work highlighted by interviewees also appear in section 5.2 as promising occupations where the median hourly wage is above our living-wage threshold. We used these interviews to help select sectors for skills maps, presented in Appendix E for selected occupations in these sectors. This is broadly consistent with trends reported in table three, with big employment increases in "Eds and Meds" over 2020, and smaller increases in manufacturing and business and professional services.

- **Manufacturing and technology.** Numerous interviewees mentioned that the largest manufacturer in the County, auto parts maker BorgWarner, had advertised positions (machinists, health and safety managers, and administrative staff) throughout mid-to-late 2020. Smaller firms have been rapidly expanding, including a producer of software for the US Federal government and a manufacturer of medical testing equipment; they recruit specialized and highly-paid programmers and engineers, but also production and administrative workers with more general skills. Table 14 shows that maintenance and repair workers receive a median hourly wage of $16.27 after 1-2 years; industrial engineers earn $27.89 after 4-6 years; technical writers earn $54.54 after 4-6 years; and software developers earn $46.24 after 4-6 years.

- **Building trades.** The County is currently experiencing a building boom and a housing shortage, although Table 3 reports a small drop in construction employment in 2020. A major priority in the County has been the reduction of carbon emissions, and this is creating further construction jobs, especially in the installation of solar panels, energy-efficient heating and cooling systems, and the weatherization of buildings. Although it is unclear how long the building boom will last, trade unionists expect continued robust demand and are recruiting apprentices, a particular focus for the workforce development system. Table 14 shows that highway maintenance workers earn $27.38 after 1-2 years; first-line supervisors of construction trades earn $21.82 after 6-8 years; and project management specialists receive $68.00 after 4-6 years.

- **Health care.** With an aging population there will be an expansion of health care work, and some of these will be living-wage jobs. There is also pent-up demand in the County for certain services; for example, the waiting time for a local dermatology appointment was mentioned. Health care occupations are numerous in Table 14: personal care aides ($20.06 after 6-12 months); home health aides ($20.28 after 6-12 months); registered nurses ($27.87 after 2-4 years); nursing assistants ($16.40 after 6-12 months), dental hygienists ($56.50 after 1-2 years); and licensed practical and licensed vocational nurses ($22.19 after 1-2 years).

- **Financial services.** There remains strong demand for university-educated professionals in financial services, and regulatory changes are favorable to accounting firms. One employer requires a four-year degree for an administrative position, often humanities graduates, because, "They need to be able to think, build relationships, manage delicate situations, exude confidence, be well spoken, send well-crafted emails. They also, interestingly, have a lot less turnover than expected." This employer reported success in retaining administrative staff. Relevant occupations in Table 14 include bookkeeping, accounting and auditing clerks ($23.75 after 2-4 years) and office clerks, general ($51.57 after 1-2 years).

3.2   Infrastructure Challenges

The County's transportation, housing, broadband internet, and childcare infrastructure is inadequate. These issues drive up the cost of living, create hard and tangible barriers to work, and reinforce disparities by race, age or disability and rural-urban and town-gown divides. The infrastructure issues existed pre-pandemic but were exacerbated in the COVID-19 era. Bus service was reduced, schools moved online, day care was closed, and people without access to the internet found it increasingly difficult to connect to online resources as libraries and other public WiFi locations closed.

Transportation and housing. In Tompkins County, large numbers of jobs are concentrated in and around the City of Ithaca, and a large percentage of workers commute from rural parts of the County or neighboring counties. Some employers (including much of the app-based gig economy) require workers to have their own reliable transportation. Some interviewees praised TCAT's ability to provide services to the County's largest employers and educational institutions (although one criticized routes as too Cornell University-centered). One workforce development professional felt that transportation was the primary barrier to work for 16-24 year-olds. Interviewees identified several problems that make it difficult to arrive at work on time or access services.

- Bus services have been cut back during the pandemic due to declining ridership. One employer introduced a shuttle service for its workers.
- Bus routes do not provide regular service to all of the rural communities in the County.
- Bus schedules do not accommodate people who work shifts outside of traditional working hours (9-5, Monday through Friday). This applies to healthcare workers as well as factory workers and others.
- Parking in downtown Ithaca can be inadequate and cost-prohibitive for commuters with cars.
- It is difficult for learners to access courses not available locally because of limited bus service to neighboring counties.

Childcare and parent care. Prior to the pandemic, provision of childcare services was expensive and scarce, especially for those working shifts outside of traditional working hours. During the pandemic, childcare capacity has been further cut back, and the burden on caregivers has increased further because of children's school moving online. Some families responded to concerns around online learning by switching to home schooling. An Ithaca City School District administrator reported that the number of home schoolers in the district has increased from 153 in 2019-20 to 252 in 2020-21.[43] These pandemic-related changes to childcare and public education make entry and reentry to the labor market more difficult. Similarly, for those families who care for elderly parents, services dwindled as care-providing agencies reacted to the pandemic. These shifts pushed people out of the labor force as they were forced to care for both children and parents as part of the "sandwich generation."

Broadband internet. The difficulty of accessing internet services, especially in rural parts of the County, was another commonly discussed aspect of the County's infrastructure. One social services provider described the County's digital divide as "more like the Grand Canyon." The divide has deepened as jobs, training courses, and public services moved online and with the closure of public spaces such as libraries and restaurants/cafes, where residents can access the internet for free. In

households with several workers and learners streaming video content and taking part in remote meetings, access is not enough: a reliable and fast connection is necessary. Broadband limits the online access for families who compete against each other for connectivity. One social services agency reported the successful use of tablet computers using the mobile phone network, and within the City of Ithaca the infrastructure was generally seen as adequate though expensive. Prices have been driven up by the near-monopoly position of a single private provider, and people who cannot afford internet access are excluded from most training and cannot easily apply for jobs. One commonly discussed solution is the creation of publicly owned alternatives. But access is only one component of the issue. Many job seekers do not have the digital literacy skills needed to apply for jobs online, work remotely online, or meet the demands of a digital economy. Training is needed for both hardware and software, if these are available to those in need.

3.3 Job Quality and Hesitancy to Work

Some of the County's larger employers have a strategy of attracting workers through better pay and conditions than their competitors. As one put it, "It sounds cliché, but the most important part is creating a good foundation for being a great place to work." Others noted that they struggled to attract and retain workers. According to one employer, for every ten workers invited to an interview, one shows up. Some interviewees – employers, workforce development professionals and service users – pointed to workers' legitimate concerns about working on-site during the pandemic, especially in customer-facing jobs. Beyond this pandemic-era "fear factor," employers pointed to job-quality challenges that also pre-date the pandemic, including pay, benefits, hours, and job stability. These are important issues for workforce development, since placement in a job that is not sustainable may have little benefit to the worker or the employer. Challenges are numerous, and training is needed for employers to assist them overcoming these barriers.

- **Safety.** Health and safety is of central concern for workers during the pandemic. Many fear that if they leave their homes every day to work during a pandemic, they or their family members could bring the virus home resulting in illness or death. This was the case for one of the service-user interviews, who had been laid off from her job and was caring for a severely disabled son. She had worked in an occupation that required interaction with the public in-person, where WFH is not an option. One workforce development agency said that placement numbers were limited because some employers lacked adequate personal protective equipment (PPE). The COVID-era fear factor was recognized by several interviewees as a reason why many workers are reluctant to accept job offers. Two of the three service-user interviewees had limited availability for paid work because they were caring for vulnerable adults.

- **Low pay and benefits.** Some employers reported that they struggled with retaining staff because of low pay; some social services agencies attribute low pay to low reimbursement rates for services. Another example of low pay compared to other employers would be businesses competing on a national market for recent university graduates or highly educated computer programmers or engineers with specialized skills in demand by large tech firms. Some employers said that workers were reluctant to take work because the pay on offer was lower than what the worker would earn from pandemic-era unemployment benefits. One trade unionist, however, reported that unemployment benefits were

unattractive to members, mainly because of the benefits package secured in collective bargaining. Another respondent spoke about unemployment benefits: "You hear it framed as a disincentive to work, but it should be an incentive for us to wake up. Who pays for childcare to go to work at Walmart while they don't have anything at home?"

- **Working time.** Some employers reported that working time was a barrier to attracting or retaining workers. Hotels, for example, reported very long hours in the period after laying off most of the staff, and that some workers – whether laid-off staff or recent Cornell University graduates – were reluctant to work these hours. The "millennial effect" was also reported in interviews where new college graduates expect to make six-figure salaries and work 9:00am-5:00pm, which isn't the case in the hospitality sector. Often the problem was a lack of flexibility, and an inability of workers and employers to collaboratively find solutions to obligations at home, such as childcare. In one example, many workers were asking for more full-time work, when the employer wanted more part-time workers, for flexibility and to avoid paying fringe benefits.

- **Job instability.** Many job placements are seen as risky, by both employers and workers. Given the stressors of life under a pandemic, especially for under-represented groups of workers, conflicts arise that quickly lead to dismissal. When asked about barriers to employment one interviewee pointed to the fragility of a new job indicating that it does not take much to knock a newly-hired worker out of their job.

- **Poaching.** The flipside of poor job quality is that employers are recruiting workers who already have jobs by offering better-quality jobs. One interviewee reported handing out business cards to workers they met in local businesses who seemed to excel at customer service. A different interviewee reported that a retailer had attempted to recruit him while he was shopping. It is important to be careful when poaching, noted interviewees, because poaching could disrupt professional business partnerships. Again, this points to the need for employer training.

3.4   Working From Home (WFH)

The shift to WFH will likely continue when the pandemic is over for many of the employers included in the research. For some workers and employers, it has few if any disadvantages, as in tech firms where workers have no problem using the technology and where employers can use it to recruit skilled workers outside of the local labor pool. For others, it can be challenging, both for workers and for management. Businesses that have recently moved into downtown offices balk at the prospect of not utilizing their new investment. In schools, colleges and universities, in particular, some instructors and students have reservations about the shift to online learning. Even here, however, students may expect more online content in the future, and some of the increase in WFH (or study from home) is likely to continue after the pandemic. Our interviewees identified several challenges.

- **Hardware and software.** Some workers struggle to use the software and hardware needed to WFH, and in rural areas where broadband internet service is inadequate simply did not have access even if they had the hardware and software. One employer of office workers said that some workers who had used desktop computers their whole careers had never used a laptop. Other employers mentioned that some workers did not have computers

or internet access at home. These challenges multiply the task of troubleshooting faced by workers in IT support functions, making their job increasingly crucial to the functioning of organizations. This can be particularly difficult where the organization's systems are slow, and now IT tools are being rolled out.

- **Accountability.** Supervisors of work-from-home employees often struggle with accountability, productivity, and meeting deadlines. This is particularly challenging for tasks that do not have quantifiable outputs – compare a multi-week task of producing analysis for a research report to a coder of medical forms going through a specified number each day. Employers were divided as to whether teams work well remotely – some noting that remote meetings were more efficient, while others saw in-person meetings as more conducive to creativity and problem-solving. One said that regular meetings between workers and their supervisors were necessary, but were not taking place.

- **Flexible work hours.** It is difficult for parents to work from home while their children's school is online and childcare centers are closed or at reduced capacity. Employers had to increase working-time flexibility to accommodate the needs of parents to care for their children. Training and guidance on how to create flexible work hours would benefit many employers in the region.

- **Social-Emotional health.** These stressors, and the sense of isolation caused by not interacting in-person with other people, were noted to exacerbate mental health issues. One employer reported making counselling available to staff to help them cope with the strains of WFH. The skills needed to compartmentalize and newly balance work, home, family, etc. need to be taught in training programs and not assumed to be inherently present in the employee's existing skills. Additionally, there is a loss of social interaction, spontaneous creativity and team innovation when working alone from home. The use of "Friday water cooler" Zoom meetings allows for some interaction, but not the spontaneous type that ignites the spark of innovation in the workplace.

3.5   Scarce Skill Sets

The vast majority of employers interviewed reported that they are facing a skills shortage. Some employers reported that the difficulty was similar to the tight pre-pandemic labor market, while others reported particular pandemic-related changes in skills requirements. The scale of the challenge becomes evident when looking at the diversity of employer answers to the question of which skillsets were scarce in the COVID-19 era. Responses included:

- **Entry-level production and service workers.** Many employers reported that they were struggling to fill positions that do not require a specific education level. This applied as much to firms that had laid off workers and were now rehiring as to ones that had ramped up during the pandemic. One economic development official pointed out, "Many businesses have had difficulty finding entry-level employees, as basic as a fourth grade reading or math level."

- **Service industries.** A great emphasis was placed on difficulties attracting workers with "employability skills". The importance of these skills and the difficulty of finding them was highlighted by one workforce development service provider who noted, "Many employers just want someone consistent, who will be there on time and not blow up on a customer.

Those life skills are focus areas for them, and COVID has exacerbated that. Soft skills get triggered when there's any kind of logistical barrier. People don't have soft skill problems when everything is going well. Anxiety gets the best of them when there's some disruption." Employability training should be a component of post-pandemic workforce training in Tompkins County.

- **College and high-school students.** The exodus of college students from the greater Ithaca area led to a sharp decline in the size of the available labor pool. One large national employer reported that, "For folks ages 16-21 in Ithaca, many do not need to work because they are supported by their parents. You don't see as many 16-21 year-olds working [for this company] as in other areas." A different large national employer, however, saw a pandemic-era increase in job applications from local high school students. The brain drain from the area is not easily fixed, but with appropriate guidance and support structures, employers would be able to overcome this obstacle.

- **Basic computing skills.** There was a widespread perception that digital and information literacy skills were lacking, both for older and for younger workers. This made it difficult to search for jobs, to learn software packages such as Microsoft Office and various Google apps commonly used in the workplace, and to work from home. Lack of access to the internet exacerbated the ability of service providers to address this gap with clients. It is difficult to provide an online training program with a focus on digital and/or information literacy when the clients don't know how to use a computer or possibly even have internet access.

- **Tradespeople with "middle" skills.** Skills that require some formal education or training short of a 4-year degree – such as a two-year associate program, a micro-credential, an industry recognized credential, and/or years of experience on the job – were in short supply. As one workforce development professional put it, "For instance, in manufacturing they're not losing production jobs. They're just changing. Lots of work is being automated. You need someone to program and to repair. The type of job in that space has changed. This is where upskilling shines. This is where 'middle skills' come into play." These jobs are mainly in construction and manufacturing. Supply-side training providers need the ability to react quickly to demand-side needs. Programs of study need to be adapted, modified, replaced or developed to meet these emerging post-pandemic requirements.

- **Specialized mid-level managers.** Managers in healthcare, technology, accounting, and education, and experienced mid-level managers, often require four years or more of college education. Employers discussed recruiting more recent graduates of local higher education institutions or selling Ithaca as an a culturally rich and family-friendly place to live for highly-skilled graduates. Others discussed hiring workers based in other parts of the country on a WFH basis, without requiring them to move to Ithaca.

Why are these skillsets so scarce? Possible improvements to training and other workforce services are discussed in the next sections, but these are not the only causes of these difficulties. Others were discussed above: the pandemic-era hesitancy of workers to accept certain jobs and the inadequacies of the local infrastructure. Other longer-standing issues include the small size of the local labor pool and more broadly a "brain drain" of graduates and professionals leaving the Ithaca area. It was reported to be difficult to recruit locally and attract workers from national or global labor markets

because there may only be one employer in the workers' specialization, making it harder to switch employers than in a big city. (Small labor market size is also a reason why some training courses are not offered locally). The "brain drain" seems severe because of the culture of Cornell University graduates who seek post-graduation employment in large cities, but that concept is likely even more severe elsewhere in upstate New York.

3.6 The Workforce Development System

An important theme in the interviews was the functioning of education institutions, social services organizations, apprenticeship programs and workforce development programs, many of which are accessed through the Tompkins Workforce New York Career Center. These parts of the workforce development system interact with employers on an ongoing basis to determine needs and place students and clients into jobs. Much information is exchanged through participation in the Workforce Development Board and decision-making Boards of other agencies in the county. However, in the words of one respondent, "Tompkins County does a great job of bringing community agencies together, and there is a lot of talking and sharing, but not enough listening!"

- **Coordination.** Concerns were raised about the coordination of the voices that are included in the workforce development system. The result may be a duplication of services, rocky transitions to work (from K-12 system, BOCES and higher education), lost opportunities in the exchange of best practices between sectors, and recruitment through "outskilling."

- **Participation.** Employers are reluctant to participate in workforce development programs. Some hesitate to recruit the job seekers who are receiving certain services, an especially sensitive topic for employers of customer-facing workers. Some were satisfied with their own in-house training, especially managers within larger organizations.

- **Cornell University.** There is a missed opportunity for a more active role for the County's dominant economic force in the workforce development conversation. Approximately half of the workers in Tompkins County work at "Eds and Meds," the vast majority at Cornell University. In November 2020, Cornell employed 10,244 faculty and staff, a number that excludes thousands more workers on the Cornell University campus, including student workers (graduate or undergrad), postdoctoral students, or certain faculty (adjunct, visiting, courtesy, and emeritus), not to mention contractors.[44] Cornell was mentioned often by interviewees as a potential employer of disadvantaged workers, a supplier of labor (including students for low-wage jobs and graduates for white-collar jobs), and in connection with long-standing and complex town-gown tensions. One argued that, "TCAT feels more like a university shuttle system that allows the community to ride" and another that the town-gown divide, "doesn't bother the college much! Cornell has failed to commit to interviews of people coming out of local programs. Cornell has turned its back on locals repeatedly."

- **Training and support.** Participants in this research had many ideas for new course offerings and services and the return of old offerings. Focus was put on "mid-level" skills and the recognition of both college and industry recognized certifications; employer-sponsored training programs involving the education system and reducing competition between service providers and employers; supporting cross-training within select industries; accelerated micro-credentials (more 5-8 week programs); employability skills; integrate industry

certification with existing courses; OJT boot camps (5-day pre-employment); more paid career paths; and entrepreneurship skills for gig workers and self-employed people.

- **Outreach.** Communication between employers and job seekers is not straightforward, and the Tompkins Workforce NY Career Center and college career services staff play an important role in facilitating it. Recruitment websites and job advertisements are not user-friendly for workers or students. Workers face challenges in communicating their skills to employers, in part because of digital literacy barriers, and in part because job websites are confusing and difficult to navigate. Service users reported successful placement in job opportunities because of the knowledge of staff at the Tompkins Workforce NY Career Center. One respondent summarized the task of helping workers navigate this system by noting, "Visit a temp agency site and fill out your profile; you'll find thousands of choices for the 'skills' section. While this is easier than writing your resume and figuring it out yourself, so many skills have crossover. Take hospitality as an example . . . Those great customer service skills are applicable to healthcare doing patient registration and patient care. So, one major task is getting people to understand that their skills are transferable." It is also a challenge to train workforce staff to identify those skills which can easily transfer between industries; those that can be "outskilled." Additionally, many County residents do not know about the services on offer. At least one interviewee called out training providers to advertise more, and one referred to the Tompkins Workforce NY Career Center as "the County's best-kept secret."

- **Good, fast, cheap: Pick two.** There are limits to what the workforce system can do. At a time of growing demand for their services, local government and community colleges face budget cuts. This may be mitigated by President Biden's proposal to support K-12 and higher education.[45] Some public-sector employment services have been further strained by the redeployment of staff to contact tracing and processing unemployment benefits claims. Moreover, because of the necessity of state approval (two years for some courses), program creation may be too slow to keep up with changing employer needs. In the Tompkins Workforce NY Career Center, the work of advising job seekers has been hampered by the shift to remote working, which eliminates spontaneous interactions in the office that are conducive to problem-solving. Efforts must be made to mitigate these hurdles and avoid the temptation to focus only on two of the three key elements to success: good, fast, cheap.

- **Minorities and marginalized populations.** Many important voices are excluded from these deliberations, in particular people of color, front-line project workers in the community, disabled persons and service users. The research team found it extremely challenging to interview service users and detected considerable distrust of the system from many local people of color. As one (white) interviewee told us, "If you talk to the Black community, they will tell you that they're sick to death of being told that they need another credential that won't lead to anything," noting the length of programs and lack of subsidies for positions as reasons participants drop out.

SECTION 4
The Employer Survey

The employer survey examined many of the same questions and supports several of our recommendations, in particular on the need for short courses (recommendation 2) and support for employers seeking to improve the quality of entry-level jobs (recommendation 3). In all, 89 employers provided responses, and as Table 5 shows, they represent diverse industries and vary in size. Employers were asked the following questions:

- **How much has the pandemic affected the demand for goods and services produced by local employers: increase, decrease, or not much change?** The survey confirms that the employers most adversely affected by the pandemic were accommodation and food services, arts, entertainment, and recreation. As Table 5 shows, nearly 91% experienced a decrease in demand, and the vast majority of these reported a "severe" decline of more than 20%. Other industries reported mixed effects, with some respondents experiencing an increase and some a decrease in health care and social assistance, manufacturing, professional, scientific, and technical services, retail trade, and "other". Most education respondents and all public sector reported a decline in demand.

Table 5. Impact of the pandemic on County employers

Industry	# of responses	Average # of employees	Impact of pandemic on demand for services, % (68 responses)			Likelihood of being open on December 31, 2021, % (56 responses)
			Decrease (<-5%)	Not much change (-5% - +5%)	Increase (>5%)	Very unlikely or not sure
Accommodation and food services + Arts, entertainment, and recreation	15	18.5	90.9	0	9.1	12.5
Construction	3	5	0	100	0	0
Education Services	6	360.8	75	25	0	0
Health care and social assistance	18	101.6	41.7	25	33.3	0
Manufacturing	6	95.6	50	16.7	33.3	0
Professional, scientific, and technical services + information	8	40.5	16.7	33.3	50	16.7
Public administration	3	3	100	0	0	0
Retail trade	5	146	33.3	33.3	33.3	0
Other	25	78.3	50	13.6	22.7	22.3

- **What is their perceived likelihood of being open on December 31, 2021: likely, unlikely?** The vast majority of respondents reported that they were likely to remain open through the end of 2021, as the right-hand column on Table 5 shows. There was some uncertainty in accommodation and food services and professional, scientific and technical services, as well as "other".

Figure 8. Employment levels in February 2021, and expected levels for June and December.
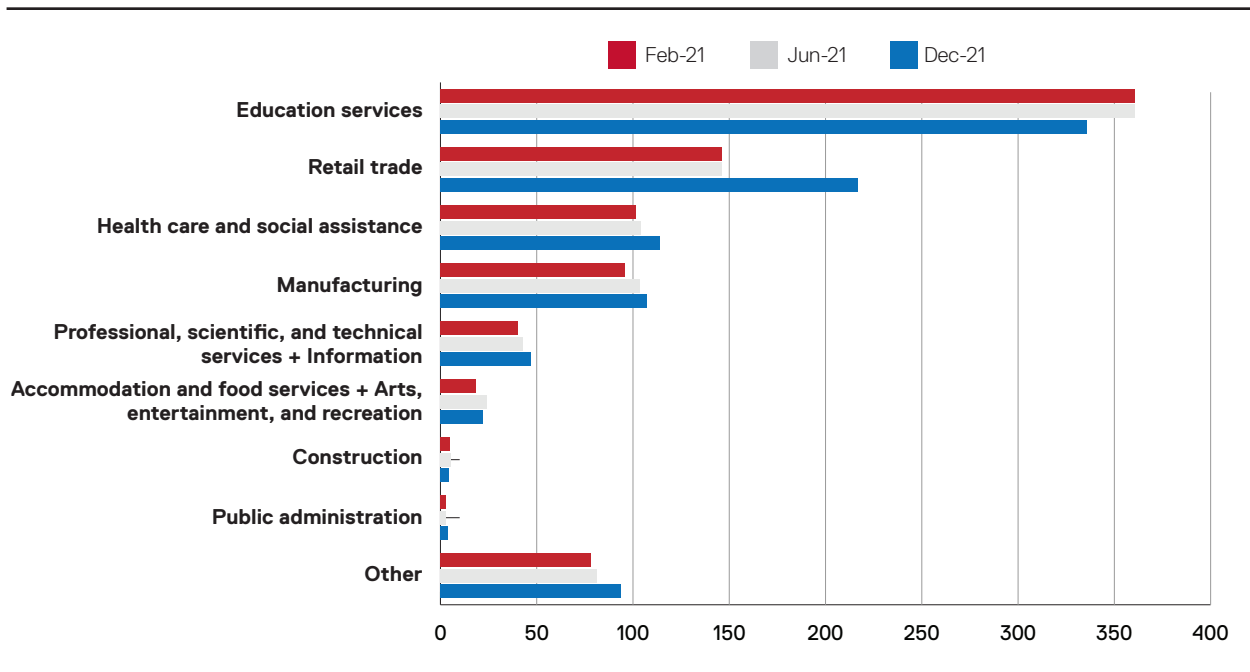
- **What are the employment levels now, and what do they expect for June 2021 and December 2021?** Figure 8 displays which sectors are planning to increase employment through 2021. Retail trade, healthcare and social assistance, manufacturing, professional, scientific and technical services, and "other" plan to add workers in both the first and second half of the years. Education expects a decline in 2021, and accommodation and food services expect to recover in the first half of 2021 but contract by December.

- **Are these remote, onsite, flexible or hybrid?** Figure 9 shows that 93% of reported current vacancies (158 out of 170) were on-site; only 1% (2 out of 170) were fully remote. The vast majority of vacancies at the time of the survey were for on-site jobs in manufacturing, healthcare, and retail.

- **What are employers' plans for advertising positions?** Over the next six months, the vast majority of employers reported that they intend to hire in education services, accommodation and food service, healthcare and social assistance, professional, scientific and technical services, and "other", as Table 6 shows.

Figure 9. Current vacancies: On-site vs Remote/flexible/hybrid

NUMBER OF VACANCIES

Categories (top to bottom):
- Accommodation and food services + Arts, entertainment, and recreation
- Construction
- Education Services
- Heath care and social assistance
- Manufacturing
- Professional, scientific, and technical services + Information
- Public Administration
- Retail Trade
- Other
- Total: 170

X-axis: 0, 50, 100, 150, 200

PERCENT OF VACANCIES ON-SITE

Categories (top to bottom):
- Accommodation and food services + Arts, entertainment, and recreation
- Construction
- Education Services
- Heath care and social assistance
- Manufacturing
- Professional, scientific, and technical services + Information
- Public Administration
- Retail Trade
- Other
- Total: 92.9%

X-axis: 0, 20, 40, 60, 80, 100

PERCENT OF VACANCIES REMOTE, FLEXIBLE OR HYBRID

Categories (top to bottom):
- Accommodation and food services + Arts, entertainment, and recreation
- Construction
- Education Services
- Heath care and social assistance
- Manufacturing
- Professional, scientific, and technical services + Information
- Public Administration
- Retail Trade
- Other
- Total: 7.1%

X-axis: 0, 10, 20, 30, 40, 50

Table 6. Intention to advertise positions

	Intend to advertise positions, next six months		
	Responses (#)	No (%)	Yes (%)
Accommodation and food services + Arts, entertainment, and recreation	11	27.3	72.7
Construction	3	66.7	33.3
Education services	3	33.3	66.7
Health care and social assistance	11	0	100
Manufacturing	5	0	100
Professional, scientific, and technical services + Information	6	16.7	83.3
Public Administration	1	100	0
Retail Trade	3	66.7	33.3
Other	21	9.5	90.5

- **What are employers' major challenges in hiring workers?** The most common challenge employers identified was the scarcity of workers with necessary certifications and formal qualifications (cited by 49% of responses), as Table 7 shows. Also common were exposure to disease risk at work (35% of responses), low compensation compared to other employers (33%), difficulty accommodating caring responsibilities at home (22%), low compensation compared to pandemic-era unemployment benefits (20%), and lack of reliable transportation to work (18%).

Table 7. "What do you identify as the major challenges in hiring people at the moment?" (55 responses)

Option selected	# of employers	% of employers
Workers with necessary certifications and formal qualifications are scarce	27	49.1%
Exposure to disease risk at work	19	34.5%
Low compensation compared to other employers	18	32.7%
Difficulty accommodating caring responsibilities at home (e.g. children and disabled relatives)	12	21.8%
Low compensation compared to pandemic-era unemployment benefits	11	20.0%
Lack of reliable transportation to work	10	18.2%
Uncertainty about career prospects	7	12.7%
Other:	14	25.5%

Unique skills specific to what we do; budget; lacking basic job skills (i.e. on time, sober, attitude, basic information retention); cost to advertise; background checks; disruption to revenue; desire to do services; lack of funding; fear of exposure to COVID; hiring committee with differences of opinion as to who makes best candidate/s; declining population

- **How much and what kind of retraining are workers undergoing during the pandemic due to changing skill requirements?** 52 employers reported that their workers had undergone some kind retraining due to changing skill requirements during the pandemic. 81% of these conducted health and safety training, 37% had their workers trained for technologies associated with remote working, and 19% trained their workers to use other technologies. 19 reported 'other', including purchase equipment to be able to work remotely; health department and human resources requirements; remote service delivery strategies; task training to take on other responsibilities; cleaning, air purification; stocking, cleaning and cashiering; cleanliness; supervising in a remote environment/additional clinical skill building trainings/general training needed for credentialing/wellbeing training for staff; and cross training.

- **How many workers are working from home, working on-site, doing both, or temporarily furloughed?** In accommodation and food services, retail trade, and manufacturing, the vast majority of work was on-site; Table 8 shows that the share of on-site workers ranged from 86% to 100% in these sectors. WFH was more widespread in education services and professional, scientific and technical services, although this varied widely depending on the job classification. Hybrid arrangements were common in healthcare and "other". Furloughs were reported in retail, accommodation and food service, and healthcare.

Table 8. Present Working Circumstances

Industry	Type	# of employees	% On-site	% WFH	% Furloughed	% Hybrid
Accommodation and food services + Arts, entertainment, and recreation	Entry Level	132	95.5	0	4.5	0
	Mid Level	50	82	0	10	8
	Senior Management	35	91.4	0	2.9	5.7
Construction	Entry Level	0	0	0	0	0
	Mid Level	7	85.7	0	0	14.3
	Senior Management	13	53.8	15.4	0	30.8
Education services	Entry Level	34	8.8	82.3	0	8.8
	Mid Level	1530	78.8	17.6	0	3.6
	Senior Management	81	69.1	24.7	0	6.2
Health care and social assistance	Entry Level	817	98.2	0.2	0	1.6
	Mid Level	312	52.2	3.8	8.3	35.6
	Senior Management	130	34.6	0	4.6	60.8
Manufacturing	Entry Level	321	99.7	0.3	0	0
	Mid Level	1019	98.0	1.6	0	0.4
	Senior Management	338	97.6	1.2	0	1.2

Table 8. Present Working Circumstances

Professional, scientific, and technical services + Information	Entry Level	10	70	30	0	0
	Mid Level	185	32.4	57.8	0	9.7
	Senior Management	48	29.2	50	0	20.8
Public administration	Entry Level	0	0	0	0	0
	Mid Level	1	0	0	0	100
	Senior Management	2	0	0	0	100
Retail trade	Entry Level	390	100	0	0	0
	Mid Level	22	86.4	0	13.6	0
	Senior Management	14	100	0	0	0
Other	Entry Level	731	95.9	0.1	0.5	3.4
	Mid Level	650	62.2	13.4	0.5	24
	Senior Management	175	51.4	10.3	2.3	36
Total		7047				

Table 9. "What are the most substantial challenges you faced as a manager with employees working from home?" (43 Responses)

Option selected	# of employers	% of responses
Supporting employees' health and productivity	26	60.5%
Communicating with employees	21	48.8%
Monitoring employees	17	39.5%
Facilitating informal interactions	17	39.5%
Accommodating work/life balance issues	16	37.2%
Navigating hybrid office arrangements	14	32.6%
Training employees for remote work	11	25.6%
Other:	3	7.0%

Balancing keeping people distant when successful, tech issues with file sharing and computing power, mail delivery

- **What are the challenges of WFH?** Employers reported numerous management challenges associated with WFH. The top challenge was "supporting employees' health and productivity" (61% of responses), as Table 9 shows. Employers also reported problems with "communicating with employees (49%), monitoring employees (40%), facilitating informal interactions (40%), accommodating work/life balance issues (37%), navigating hybrid office arrangements (33%), and training employees for remote work (25%).

Table 10. "What practical support would your organization benefit most from in 2021?" (52 responses)

Option selected	# of Employers	% of Employers
Additional resources for equitable hiring, work retention, wage progression, and career advancement	24	46.2%
Guidance on the definition of a "good job" now that candidates search criteria may have changed	16	30.8%
HR training session on county Covid policies	15	28.8%
A WFH Excellence Program, specialized for workers and managers	13	25.0%
More information on simultaneous "earn and learn" options	13	25.0%
A guided web resource on "hiring during a pandemic and beyond"	12	23.1%
Other:	10	19.2%

Transportation assistance (bus schedule) to surrounding areas with affordable housing 7 days a week until late night, reaching the workforce needed in a financially acceptable way, government and schools providing and encouraging vocational training and education, Odyssey Bookstore, web-based programs for remote work, filling new positions is stressful.

What kind of support would be most beneficial for employers from the workforce development system? The most common option chosen was "additional resources for equitable hiring, work retention, wage progression, and career advancement" (46% of responses), as Table 10 shows. In second place was the related option of "guidance on the definition of a 'good job' now that candidates' search criteria may have changed (31%). Others selected "training session on County COVID policies" (29%), "a WFH Excellence Program" (25%), "simultaneous 'earn and learn' options" (25%), and a guided web resource on "hiring during a pandemic and beyond" (23%).

- **Which skills matter to employers?** Table 11 ranks skills categories taken from O*NET in terms of the percentage of employers who report that they are "very important". The most frequently cited skill is the "basic skill" of "talking to others to convey information effectively". Fourteen additional skill categories are cited by at least 50% of employers, including 6 "basic skills" (active listening, critical thinking, reading comprehension, active learning, writing, and learning strategies), 4 "social skills" (service orientation, coordination, social perceptiveness, and persuasion", 3 "resource management skills" (time management, management of personnel resources, management of material resources), and "complex problem-solving".

Table 11. Employer demand for skills, by O*NET category

Option selected	% of employers who say this is "very important"
Basic skills - Speaking: Talking to others to convey information effectively.	87.5
Resource Management Skills - Time Management: Managing one's own time and the time of others.	83.9
Social Skills - Service Orientation: Actively looking for ways to help people.	80.4
Basic skills - Active Listening: Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.	76.4
Social Skills - Coordination: Adjusting actions in relation to others' actions.	75.0
Basic skills - Critical Thinking: Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.	74.5
Social Skills - Social Perceptiveness: Being aware of others' reactions and understanding why they react as they do.	73.2
Basic skills - Reading Comprehension: Understanding written sentences and paragraphs in work related documents.	70.9
Basic skills - Active Learning: Understanding the implications of new information for both current and future problem-solving and decision-making.	67.9
Resource Management Skills - Management of Personnel Resources: Motivating, developing, and directing people as they work, identifying the best people for the job.	66.1
Basic skills - Writing: Communicating effectively in writing as appropriate for the needs of the audience.	64.3
Basic skills - Learning Strategies: Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things.	61.8
Complex Problem Solving Skills - Complex Problem Solving: Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.	55.4
Resource Management Skills - Management of Material Resources: Obtaining and seeing to the appropriate use of equipment, facilities, and materials needed to do certain work.	51.8
Social Skills - Persuasion: Persuading others to change their minds or behavior.	51.8
Basic skills - Monitoring: Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.	50.9

Table 11. Employer demand for skills, by O*NET category

Resource Management Skills - Management of Financial Resources: Determining how money will be spent to get the work done, and accounting for these expenditures.	46.4
Social Skills - Instructing: Teaching others how to do something.	46.4
Social Skills - Negotiation: Bringing others together and trying to reconcile differences.	41.1
Systems Skills - Judgment and Decision Making: Considering the relative costs and benefits of potential actions to choose the most appropriate one.	37.5
Systems Skills - Systems Evaluation: Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.	37.5
Systems Skills - Systems Analysis: Determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes.	30.4
Basic skills - Mathematics: Using mathematics to solve problems.	27.3
Technical Skills - Equipment Maintenance: Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.	25.0
Technical Skills - Equipment Selection: Determining the kind of tools and equipment needed to do a job.	25.0
Technical Skills - Quality Control Analysis: Conducting tests and inspections of products, services, or processes to evaluate quality or performance.	25.0
Technical Skills - Troubleshooting: Determining causes of operating errors and deciding what to do about it.	23.2
Technical Skills - Installation: Installing equipment, machines, wiring, or programs to meet specifications.	19.6
Technical Skills - Operation and Control: Controlling operations of equipment or systems.	19.6
Technical Skills - Repairing: Repairing machines or systems using the needed tools.	19.6
Basic skills - Science: Using scientific rules and methods to solve problems.	18.2
Technical Skills - Technology Design: Generating or adapting equipment and technology to serve user needs.	16.1
Technical Skills - Operation Monitoring: Watching gauges, dials, or other indicators to make sure a machine is working properly.	14.3
Technical Skills - Operations Analysis: Analyzing needs and product requirements to create a design.	14.3
Technical Skills - Programming: Writing computer programs for various purposes.	10.7

SECTION 5
Designing Better Jobs and a Workforce System of Excellence

There is a clear and urgent need to assist workers affected by the pandemic, especially those who have lost their jobs. In the immediate future, County agencies should target and incentivize living-wage jobs to take the place of vulnerable, sub-living-wage jobs. This is true for both jobs that were lost due to the COVID pandemic and jobs that fail to provide a living/family-sustaining wage. Doing so needs to be informed by an understanding of the education and skills of the workers who will potentially fill the new jobs, as well as which jobs might fit in and adapt to the regional economy in its existing state. The skills maps that are part of this report begin to build the framework for the training and skills needed to achieve this goal.

The tasks of visioning, planning for, and building an inclusive, equitable, worker-centered economy are critical components of identifying and ideating the training needed for job seekers to enter better jobs through a workforce system of excellence. By deploying a fact-driven, ongoing, dynamic process that ensures success, County agencies should lean heavily into a highly participatory, inclusive, democratic, collaborative mind-set. This section provides and explains some data visualizations to support that work.

5.1   Vulnerable Industries and Occupations: Education Levels and Top Skills

The educational attainment of the 6,500-plus workers who hold (held) positions in industries that experienced job loss is shown in Table 12. Roughly four of every five workers in Tompkins County possess at least a High School Diploma (HSD) or High School Equivalency (HSE). Nearly 13% of the identified workers hold a two-year degree, 21% a four-year degree, and 7% a graduate or professional degree. This diverse mix of educational attainment suggests that new jobs can be equally diverse, adding to greater local economic resilience here.

Table 12. Educational Attainment in Vulnerable Occupations from Job-Losing Industries

Educational Attainment	# of Workers	% of Employers
Less than High School	803	12.3%
High School Diploma or High School Equivalency	1,427	21.8%
Some College	1,618	24.8%
Associate's Degree	838	12.8%
Bachelor's Degree	1,379	21.1%
Master's Degree	409	6.3%
Doctorate or Professional Degree	60	0.9%

Given the magnitude of job losses in Retail Trade, Leisure and Hospitality, and Other Services, one might conclude that most workers in vulnerable occupations possess essential social skills, such as Active Listening, Speaking, Service Orientation, Social Perceptiveness, Persuasion, Monitoring, and Coordination. These skills are needed in several "Bright Outlook" jobs in industries projected to grow in New York's Southern Tier over the next five years. These employability skills can be addressed through short-term training courses that offer contextualized instruction and remediation based on the DOL Employability Framework. Additionally, the County has abundant opportunities to both re-skill existing workers to new "Bright Outlook" jobs as well as outskill job seekers to new occupations. The current supply side agencies operating within Tompkins County have the infrastructure available to stand up these programs quickly, efficiently, and effectively. Each of these also aligns to the performance outcomes for WIOA-funded agencies making the programs a win-win for both the supply and demand side of the economy.

5.2 Areas of Growth

Growing industries in the Southern Tier. Economists at the NYS DOL periodically publish projections of job growth by industry, for the different Labor Market Regions (LMR) in New York State. Tompkins County is situated in the Southern Tier LMR, which consists of Broome, Chemung, Chenango, Delaware, Schuyler, Steuben, Tioga, and Tompkins Counties. The most up-to-date DOL employment projections for this eight-County region cover the period 2016-2026.[46] Because they were made nearly five years ago, they do not account for the pandemic. However, they offer a reasonable starting point for identifying expanding industries. The total level of employment in the Southern Tier is expected to reach 328,390 jobs in 2026, up from 307,570 in 2016, for an increase of 6.8% over ten years, annual growth of 0.65%. Using this threshold, the research team defined "high growth" industries as those where projected job gains through 2026 were above average, i.e. above 0.65% per year. The top-10 "high growth" industries in the Southern Tier (i.e. not only the County) are summarized in the Table 13.

Table 13. Top 10 Growth Industries in the Southern Tier, based on NYS DOL projections

NAICS Code	Industry	Employment (2016)	Employment (2026)	Net Change	Percent Change	Annual Growth Rate
62	Health Care and Social Assistance	41,570	48,730	7,160	17.22%	1.59%
61	Educational Services	62,850	68,260	5,410	8.61%	0.83%
621	Ambulatory Health Care Services	9,650	12,380	2,730	28.29%	2.49%
1024	Professional and Business Services	22,710	24,830	2,120	9.34%	0.89%
623	Nursing and Residential Care Facilities	9,760	11,830	2,070	21.21%	1.92%
624	Social Assistance	8,410	10,470	2,060	24.49%	2.19%

Table 13. Top 10 Growth Industries in the Southern Tier, based on NYS DOL projections

72	Accommodation and Food Services	21,210	22,700	1,490	7.02%	0.68%
601	Self Employed Workers, All Jobs	15,680	17,150	1,470	9.38%	0.90%
722	Food Services and Drinking Places	18,770	20,220	1,450	7.73%	0.74%
541	Professional, Scientific, and Technical Svcs	10,280	11,420	1,140	11.09%	1.05%

Bright outlook jobs in growing industries. O*NET synthesizes annual employment projections from the BLS into a list of "Bright Outlook" occupations, which are characterized by Rapid Growth (faster than average) and Numerous Job Openings. The current Bright Outlook data were derived from the BLS's most recent projections, for the period 2019-2029.[47] After joining both O*NET job outlook data (which are national) and NYS DOL "high growth" industry data (which are regional) to ACS PUMS records, researchers identified jobs that meet the following criteria:

- The occupation is in an industry with a projected annual average growth rate greater than the average of 0.65% per year through 2026 (from NYS DOL);

- The occupation is classified as having a "Bright Outlook" by O*NET, based on ten-year BLS projections through 2029;

- The median computed wage for existing workers in the occupation is at or above the Tompkins County living wage of $15.37 per hour; and

- The occupation is not one classified by NYU researchers as being highly susceptible to COVID-related job or income losses.

For each job matching those criteria researchers identified the top three skills needed for the occupation, the modal level of experience required for the job,[48] and whether or not the job is conducive to teleworking.[49] According to the most recent Census ACS PUMS data, just under 7% of workers in Tompkins County reported that they worked from home (prior to the pandemic). These tables suggest that the number of jobs that can be done on a work-from-home or remote bases in the County could be around seven times that figure. They are presented separately for occupations at three levels of education: high school, associates' degree (or "some college"), and bachelor's degree.

The results from these experimental job targeting analyses are presented in table 14. If the number of matching jobs exceeds 15, then the tables are limited to the top 15 positions based on current employment levels.[50] These tables are intentionally presented without comment. While data analyses may uncover potential targets that can inform economic recovery strategies, the findings from those analyses should not be prescriptive. Decisions about targeting occupations should be made in partnership with relevant stakeholders and with high levels of inclusive participation.

Table 14. High School Diploma or Equivalent / HSE

Job Title	Skill 1	Skill 2	Skill 3	Experience	Remote Work	Current Number of Workers	Median Hourly Wage
Landscaping and Groundskeeping Workers	Operation and Control	Speaking	Critical Thinking	Over 1 year, up to and including 2 years	No	189	$22.52
First-Line Supervisors of Retail Sales Workers	Active Listening	Speaking	Service Orientation	Over 4 years, up to and including 6 years	No	112	$28.55
Receptionists and Information Clerks	Active Listening	Speaking	Service Orientation	Over 1 year, up to and including 2 years	No	80	$18.47
Nursing Assistants	Service Orientation	Active Listening	Social Perceptiveness	Over 6 months, up to and including 1 year	No	72	$16.40
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	Active Listening	Critical Thinking	Social Perceptiveness	Over 6 months, up to and including 1 year	No	57	$16.07
Personal Care Aides	Service Orientation	Social Perceptiveness	Active Listening	Over 6 months, up to and including 1 year	No	48	$20.06
Highway Maintenance Workers	Operation and Control	Operation Monitoring	Monitoring	Over 1 year, up to and including 2 years	No	37	$27.38
Home Health Aides	Active Listening	Service Orientation	Social Perceptiveness	Over 6 months, up to and including 1 year	No	36	$20.28
Agricultural Workers, All Other	Operation and Control	Operation Monitoring	Troubleshooting	Over 1 year, up to and including 2 years	No	33	$19.23
Tree Trimmers and Pruners	Operation and Control	Operation Monitoring	Critical Thinking	Over 8 years, up to and including 10 years	No	32	$18.26
Maintenance and Repair Workers, General	Equipment Maintenance	Repairing	Troubleshooting	Over 1 year, up to and including 2 years	No	26	$16.27
Customer Service Representatives	Active Listening	Speaking	Service Orientation	Over 1 year, up to and including 2 years	Yes	25	$22.19
Security Guards	Active Listening	Speaking	Monitoring	Over 3 months, up to and including 6 months	No	20	$19.84
Dental Laboratory Technicians	Reading Comprehension	Critical Thinking	Quality Control Analysis	Over 6 years, up to and including 8 years	No	14	$38.96

Table 14. High School Diploma or Equivalent / HSE

Veterinary Assistants and Laboratory Animal Caretakers	Active Listening	Critical Thinking	Reading Comprehension	Over 6 months, up to and including 1 year	No	14	$26.58
Laborers and Freight, Stock, and Material Movers, Hand	Critical Thinking	Coordination	Operation and Control	Over 6 months, up to and including 1 year	No	13	$24.93

Table 14B. 2-Year College Degree

Job Title	Skill 1	Skill 2	Skill 3	Experience	Remote Work	Current Number of Workers	Median Hourly Wage
Registered Nurses	Active Listening	Social Perceptiveness	Speaking	Over 2 years, up to and including 4 years	No	330	$27.87
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	Active Listening	Speaking	Reading Comprehension	Over 1 year, up to and including 2 years	Yes	162	$23.09
Paralegals and Legal Assistants	Reading Comprehension	Active Listening	Writing	Over 1 year, up to and including 2 years	Yes	98	$21.16
Life, Physical, and Social Science Technicians, All Other	Reading Comprehension	Active Listening	Writing	Over 2 years, up to and including 4 years	No	92	$17.69
Veterinary Technologists and Technicians	Active Listening	Critical Thinking	Reading Comprehension	Over 6 months, up to and including 1 year	No	78	$20.42
Bookkeeping, Accounting, and Auditing Clerks	Mathematics	Reading Comprehension	Active Listening	Over 2 years, up to and including 4 years	Yes	48	$23.75
Office Clerks, General	Reading Comprehension	Active Listening	Speaking	Over 1 year, up to and including 2 years	Yes	42	$51.57
Childcare Workers	Monitoring	Service Orientation	Social Perceptiveness	Over 1 year, up to and including 2 years	Yes	40	$24.76
Education Administrators, All Other	Reading Comprehension	Active Listening	Speaking	Over 2 years, up to and including 4 years	No	40	$50.22

Table 14B. 2-Year College Degree

Licensed Practical and Licensed Vocational Nurses	Service Orientation	Reading Comprehension	Active Listening	Over 1 year, up to and including 2 years	No	33	$22.19
Dental Hygienists	Speaking	Active Listening	Critical Thinking	Over 1 year, up to and including 2 years	No	32	$56.50
Engineering Technologists and Technicians, Except Drafters, All Other	Critical Thinking	Reading Comprehension	Operation Monitoring	Over 2 years, up to and including 4 years	No	22	$39.16
Community and Social Service Specialists, All Other	Active Listening	Writing	Speaking	Over 1 year, up to and including 2 years	No	21	$17.44
First-Line Supervisors of Construction Trades and Extraction Workers	Coordination	Active Listening	Speaking	Over 6 years, up to and including 8 years	No	21	$21.82

Table 14C. Bachelor's Degree

Job Title	Skill 1	Skill 2	Skill 3	Experience	Remote Work	Current Number of Workers	Median Hourly Wage
Software Developers	Programming	Active Listening	Critical Thinking	Over 4 years, up to and including 6 years	Yes	324	$46.24
Social Workers, All Other	Active Listening	Speaking	Critical Thinking	Over 1 year, up to and including 2 years	No	177	$32.30
Social and Community Service Managers	Social Perceptiveness	Service Orientation	Active Listening	Over 4 years, up to and including 6 years	Yes	151	$49.45
First-Line Supervisors of Office and Administrative Support Workers	Reading Comprehension	Active Listening	Speaking	Over 4 years, up to and including 6 years	Yes	76	$16.86
Technical Writers	Writing	Reading Comprehension	Active Listening	Over 4 years, up to and including 6 years	Yes	63	$54.54

Table 14C. Bachelor's Degree

Computer and Information Systems Managers	Critical Thinking	Reading Comprehension	Active Listening	Over 6 years, up to and including 8 years	Yes	62	$25.90
Office and Administrative Support Workers, All Other	Mathematics	Reading Comprehension	Critical Thinking	Over 2 years, up to and including 4 years	Yes	57	$24.28
Industrial Engineers	Reading Comprehension	Active Listening	Critical Thinking	Over 4 years, up to and including 6 years	No	53	$27.89
Web Developers	Programming	Critical Thinking	Reading Comprehension	Over 1 year, up to and including 2 years	Yes	53	$30.42
Human Resources Specialists	Speaking	Reading Comprehension	Active Listening	Over 4 years, up to and including 6 years	Yes	49	$33.80
Project Management Specialists	Critical Thinking	Reading Comprehension	Active Listening	Over 4 years, up to and including 6 years	Yes	49	$68.00
Child, Family, and School Social Workers	Active Listening	Speaking	Critical Thinking	Over 1 year, up to and including 2 years	No	39	$25.35
General and Operations Managers	Active Listening	Speaking	Monitoring	Over 4 years, up to and including 6 years	Yes	39	$30.22
Computer Occupations, All Other	Critical Thinking	Reading Comprehension	Active Listening	Over 2 years, up to and including 4 years	Yes	29	$41.52
Elementary School Teachers, Except Special Education	Speaking	Instructing	Learning Strategies	Over 1 year, up to and including 2 years	Yes	29	$17.89

SECTION 6
Recommendations

SECTION 6
Recommendations

The Tompkins County economy has changed dramatically as a result of COVID-19. From the perspective of employers, educators and program participants, the research findings emphasize that that both businesses and workers can benefit from envisioning "the new possible." To proceed with confidence, the research team recommends the following:

6.1 Recommendation 1: Bring the Gears Together for Innovation Through Collective Impact.

Collective impact is a method of bringing together key stakeholders to achieve common missions and visions. In our qualitative research it was evident that the actors already involved in workforce development need improved coordination and more inclusive voices should be represented.[51] The workforce development system can make real progress in reducing disparities in the local labor market with a collective impact approach.

Collective impact can succeed under five conditions.

- **A shared vision for change** including a common understanding of the problem and a joint approach to solving it through agreed upon actions, with an aim of bringing together expertise.

- **Data collection and measuring results** should be collective and consistent across all participants to strengthen accountability.

- **Participant activities** must be differentiated while still being coordinated through **a mutually reinforcing plan of action.**

- **Communication must be continuous,** consistent, and open to build trust.

- A separate "backbone organization" is needed with staff and a specific set of skills to serve as **the backbone for the entire initiative,** coordinate participating organizations and agencies, and to hold them accountable.

The research team recommends that the Tompkins County Workforce Development Board initiate the collective impact process. This should start with an examination of the collective impact projects which already exist in Tompkins County to skill and re-skill residents, and place them in to jobs. The Workforce Board should prioritize inclusion and the complementary strengthening of Tompkins County businesses.

6.2 Recommendation 2: Develop a Compendium of Short-Term Courses for Employers and Job Seekers.

WFH Excellence Program. The research team proposes a WFH Excellence Program for front-line supervisors and workers to identify and address these kinds of challenges. When New York State ordered the closure of workplaces not deemed essential, some employers transferred to a work-from-home model. These included education institutions, financial services, government, technology and others. During a pandemic, WFH can be an important benefit for workers who cannot or do not want to leave their homes, especially those with disabilities and childcare responsibilities. But the employers we surveyed reported challenges "supporting employees' health and productivity", as well as communication and monitoring employees, and facilitating informal interactions (see table 9, above). To address these problems, a course could involve support from a mentor at a business that has reported success in shifting to a work-from-home model. Where education institutions are already establishing offerings on WFH, members of the Workforce Development Board and experts should be involved in designing the offering. Trainings should address concerns about online security and other problems such as accountability, productivity, social needs, keeping deadlines, and supervising.

Digital and information literacy. While much WFH will continue when the pandemic is over, WFH also involves challenges. Digital and information literacy, for example, could be improved by embedding International Society for Technology in Education (ISTE) standards into educational programs and using modules from the European Computer Driver License Foundation (ECDL).[52] Further, a short-term certificate could be awarded to people who successfully complete training in the areas of digital and information literacy.

Hardware and software basics. While most people are comfortable using smartphones, the skills needed do not transfer to desktop computers, laptop computers or tablets. A short-term course that introduces computer basics (hardware and software) could ease the transition of job seekers who need access to online search engines and application forms, while also upskilling them for what their new jobs might demand.

Health safety in the workplace. To overcome the "fear factor" of returning to the workplace, short-term courses should be developed that address workplace health and safety in a post-pandemic economic recovery. Face masks, social distancing and hand sanitizer will be around for many months, or even years, to come, but best-practices that are industry driven can help ease the anxiety of those looking to return to customer-facing employment.

6.3 Recommendation 3:
Launch a Good Jobs Initiative to Stabilize Entry-Level Jobs, Using In-Work Support, Including a New, Local Definition of "A Good Job" as Influenced by the Pandemic and Jobs of the Future.

Many employers that were interviewed reported that, although workers with the necessary skills are applying for their job openings, it is still very difficult to fill positions. One pointed out that for every 10 workers invited to an interview only one shows up. Beyond the pandemic-era 'fear factor' of working in customer-facing jobs, longstanding job-quality challenges such as pay, benefits, hours, and job stability can also be barriers to recruitment and retention. When we asked employers in the survey, what practical support they could benefit most from in 2021, the two most popular choices were "additional resources for equitable hiring, work retention, wage progression and career advancement" and "guidance on the definition of a 'good job'" (see table 10, above). Moreover, job quality issues

such as safety, compensation, and flexible work time were reported as important challenges in hiring workers (see table 7, above). These are challenges for workforce development: training and placing workers in jobs may not benefit workers or job seekers if (for example) those jobs are not sustained. Drawing on Danish and French models, efforts to address this problem could have strong input from the service users themselves.

A Good Jobs Initiative is needed to improve the quality of entry-level jobs. The starting point is providing at-work support for users of workforce development services newly placed in jobs that would reduce risks both to employers and workers. This program should be designed as a collaboration between employers, service users, community activists, social services, workforce development, and academic researchers. The result would be a program that offers more support for the lowest paid and essential workers.

The research team recommends launching an initiative that includes employers, workforce development, social services, education, and labor organizations, with an emphasis on workers in the community experienced in helping jobseekers into good-quality, entry-level jobs. Health and safety should be an important priority.[53]

6.4   Recommendation 4: Maximize Human-centered Design and Innovation.

Human-centered, or customer-centered design, is built around several concepts that encourage groups or agencies to think differently about the services they provide. First, people need to ask the right questions. Often questions are phrased in negative problem-solving framework rather than in a positive framework. For rather than asking, "How can we stop so many people from walking out before we can enroll them in our programs?" the question could be phrased, "What can we do to encourage people to stay longer on their initial visit and enroll in our programs?"[54] Second, all staff need to get out from behind their desks. It is important to avoid mental stagnation and become part of the agency that is operating around you. This could also include doing visits to other agencies to learn more about their processes and procedures, or simply just sitting and watching how other departments within your organization operate so as to better understand the staff and client relationships. Third, it is important to make user feedback a priority. To best serve clients, agencies need to not only survey the clientele, but also staff, faculty, and anyone who is a stakeholder in the agency's success. Input needs to be frequent, anonymous, and reflective. Fourth, designing or redesigning how the agency does what they do is a team sport. Everyone's input is valuable and needed. Cultivating an environment where stakeholders are comfortable sharing ideas, ideating concepts and thinking outside the proverbial box is crucial to organizational change and the revisioning process. Fifth, minimum viable prototypes need to be developed and deployed. Great ideas need to be tested and refined and tested again. Failure is part of success and trying things out on a small basis can have dramatic program outcomes. Sixth, start over at the beginning again. Organizational improvement, change and growth is an iterative process that never ends.

The research team recommends implementing a human-centered design model in the County with the goal of bringing voice and action to post-pandemic initiatives.

6.5   Recommendation 5:
Expand the National External Diploma Program.

Adult education has long been recognized as a local and regional economic driver. It fosters academic and career pathways which lead to higher wages, sustainable income, and stronger generational support for education. Given the technology available today, adults can study and advance both in traditional classroom settings, and through distance learning programs. However, not all adults are suited to the traditional environment of classroom learning and high stakes tests.

Filling multiple roles in our daily lives, adult learners parent their children, work, engage in family and community activities, and juggle the demands of an increasingly busy life. Education alternatives, such as distance learning, have eased the ability to engage in the education pipeline, yet high stakes testing remains the norm, a norm that is not suited for everyone. The National External Diploma Program (NEDP), established in 1975, fills a vital need for adults seeking completion of a high school diploma, while building on the expertise, experience, and skills they have acquired through life.

NEDP, currently implemented by TC3, meets the requirements of WIOA Title II, and is one of two options for high school completion available to adults in New York State. NEDP is a competency-based, high school diploma program aligned to the College and Career Readiness Standards and the IET requirements of WIOA. NEDP allows clients to use the skills gained from life and work experience to demonstrate reading, writing and math skills at the high school level. This web-based program for adults and out-of-school youth offers flexibility to earn their diploma even if they are employed full time, enrolled in job training, or have other commitments.

The NEDP contextualized learning program design encourages co-enrollment with WIOA partners in career pathway approaches. NEDP participants earn a high school diploma through documentation of educational attainment and through the College and Career Competency that prepares the client to enter the workforce, upgrade skills, advance to a better job, or move from one field of work to another. For youth or individuals with limited work experience, the College and Career Competency verifies that an NEDP graduate has the work readiness, situational judgment, problem solving and critical thinking skills to be successful in an entry level job.

The research team recommends expanding the current NEDP program that is offered at TC3 to include more employers, onsite delivery at workplaces, and a broader array of community partners to act as a pipeline into the program.

6.6   Recommendation 6:
Create an Anchor Institutions Forum.

The interviews uncovered success stories in town-gown relations. Interviewees praised Cornell University's support for local COVID testing ("lives were saved"), firms founded by Cornell graduates, and the quality and relevance of Cornell's course offerings for their own staff. Others pointed out that the hardest-hit businesses were those that depended most on Cornell for business and some were critical of the University as not always being constructive in its relations with communities shut out from employment opportunities.

The County depends on Cornell, but this relation of dependence is not one-way. Universities are "anchor institutions": place-based by reason of mission, invested capital, or relationships to students and employees, their successful operations are inextricably tied to the welfare of local communities. They can be "powerful collaborators in economic, educational, and civic renewal efforts".[55] Some universities have a strategy that (in principle) places these activities at the center. The University of California, San Francisco (UCSF) for instance says in its mission statement, "Anchor institutions are place-based, mission-driven entities such as hospitals, universities, and government agencies that leverage their economic power alongside their human and intellectual resources to improve the long-term health and social welfare of their communities.[56]" There is a strong case for strategic engagement by top Cornell University administration in addressing disparities locally, as other elite US universities have done.

The research team recommends the creation of an Anchor Institutions Forum to promote local Eds and Meds – Cornell, Ithaca College, and Cayuga Medical Center – and to invest in local community development. To function, this needs support from the highest administrative level at each institution. It should celebrate successes, but also find ways to address the County's disparities. Cornell could find models from peer institutions, such as Yale and UPenn.[57] One promising way to do this is through Project Labor Agreements and Community Benefits Agreements to financially support apprenticeship and pre-apprenticeship programs, facilitate the entry of women and people of color in the building trades and increase local hiring. This Forum could be developed with advice from The Democracy Collaborative, which works with universities around the country on these issues.

6.7 Recommendation 7: Make Racial Equity a Priority and Measurement for Workforce Development Programs.

One of the most notable findings within this research is the labor force participation rate in Tompkins County of 57%, which is low and below average compared to New York State. Prior to the COVID-19 pandemic, unemployment rates for Black or African American and Hispanic/Latinx groups were consistently higher than for the general population, and this reality was further intensified by the impact of pandemic job loss.

The statistical analysis identified approximately 6,500 workers (14% of all workers in Tompkins County) who are or were employed in "vulnerable industries" that experienced significant job loss. More than 22% of these workers are Black, Indigenous and Persons of Color. Following the pandemic, statistical work continues to assess labor force participation for these groups, compared to the general population.

There is much that can and should be done within workforce development to reverse this impact and address the prior trend. For employers responding to the survey, the most popular form of support was "additional resources for equitable hiring, work retention, wage progression, and career advancement" (see table 10, above). Although they are not currently present in Federal and State law, the Tompkins County Workforce Development Board can place additional, aspirational, community-agreed targets on programs to ensure greater equity and inclusion. This could coordinate with the Good Jobs Initiative as recommended in 6.3 above.

6.8 Recommendation 8:
Prioritize Green Jobs for the Design and Delivery of Workforce Development.

The local economic impact of the COVID-19 pandemic coincides with the release of "The Green Workforce Report: Information and Recommendations for Tompkins County," a long-awaited review of the green economy and climate jobs, collaboratively prepared by members of the Tompkins County Climate and Sustainable Energy Advisory Board. The Tompkins County Energy Roadmap produced in 2016 called for an 80% greenhouse gas reduction goal by 2050. Then in 2019, the Energy Strategy stretched the 80% reduction goal to focus on net-zero emissions in the shortest timeline possible.

These goals require a skilled workforce, and the substantial impact of the pandemic has brought a renewed focus on taking this economic agenda forward. The report focuses on jobs in the building, energy and transportation sectors, as these are the primary source of greenhouse gases in New York State. Additional analysis for Tompkins County includes high tech and manufacturing jobs, and jobs in agriculture and forestry which can actively sequester carbon.

The report is clear that to meet the Energy Strategy, businesses throughout Tompkins County will need skilled solar installers, construction workers, energy managers, and contractors to retrofit buildings for greater efficiency and electrification, and to create new local, clean energy resources. The move to electric vehicles also requires skilled and knowledgeable workers. Existing programs and new funding streams should be maximized for this purpose.

6.9 Recommendation 9:
Scale this Conversation Up to the Regional Level.

This report has covered Tompkins County, as an initial assessment of economic changes resulting from the COVID-19 pandemic. However, the geographical extent of the labor market is much broader. As much as 45% of the County's workforce commutes in from the surrounding area (see figure 3, above), some the courses not available locally are available in neighboring counties, and some major employers operate across county boundaries. At the same time, public transportation is limited, and an increase in commuting may be putting pressure on the housing markets of neighboring Counties. The challenges facing workers and employers should be understood at the multi-County level.

The research team recommends expanding this work in the report from the Cornell University ILR School and Pathways to Careers (P2C), to cover parts of the Southern Tier and other Counties strongly linked to the regional economy. Tompkins County and the Tompkins County Workforce Development Board are well-placed to assemble their counterparts in Cortland, Tioga, Chemung, Schuyler, Seneca, and Cayuga Counties to identify common workforce development challenges and to consider a research agenda for understanding the "new possible" here.

SECTION 7
Skills for Employment in Tompkins County

On March 13, 2020, Tompkins County announced a state of emergency, not knowing at the time how long or what impact the COVID-19 pandemic would have on our work, education, health, and social interactions. Successive executive orders from the Governor's office then followed, to immediately reduce the on-site workforce, with only "essential" businesses remaining open and to varying degrees of service and operation. In October 2020, as understanding of the economic impact of COVID-19 was being interpreted and managed, Tompkins County businesses, educators, and government leaders asked for a plan that would enable the community to transition from the unforeseen challenges of 2020, and into and more stable and confident 2021. Nearly every public and private meeting focused on the changes needed to the local workforce development system, such as:

- our new understanding of "working from home" as not just possible, but probable;
- the questionable effectiveness of existing training programs (and sunsetting those that do not result in a living wage);
- the continued skills shortages experienced by local employers
- the new ways we earn and learn (including but not limited to OJT, apprenticeships, and paid internships);
- the continued shortage of skilled workers in some industries;
- the over-supply of workers in industries forced to down-size (and the need for outskilling);
- the new conceptualization of "safety at work," and
- the never-before seen adaptability of Tompkins County businesses and residents.

Within the most difficult of the COVID-19 months the community also took the time to identify good practice, celebrate victories, and encourage one another to focus on the future.

The introduction of the global pandemic has altered traditional decisions about developing the workforce and sustaining the viability of our local businesses. The Tompkins County economy is no longer based on simply the "supply and demand" of labor, which for workforce development programs relied on a calculation of "employment + skills = jobs."

We have learned, and this report confirms, that our new understanding is a math of "employment + skills + pandemic + altered jobs + changing social realities = stabilization and shared growth."

The Tompkins County Workforce Development Board welcomes the recommendations within this report. The Board's workplan going forward will be based on:

The Tompkins Pledge, a County-wide accord, with an overall strategy based on the collective impact model) (acknowledgement of Recommendation 1)

Collaborative Agreement on Skills Maps for the occupations most likely to grow and least likely to be filled (Recommendations 1, 2, 3, 4, 5)

Development of a Work from Home Excellence program, to serve businesses, managers and employers to maximize productivity as further adjustments are made to this new way of working. This will coincide with the promotion of job opportunities that can be done on a hybrid basis of both in-office and online (Recommendations 2 and 3)

Inclusion Targets for Workforce Innovation and Opportunity Act (WIOA) Programs, with a new way to prioritize and measure equity, including aspirational targets for the skilling, employment and advancement of

- Black, indigenous, and people of color
- People with physical, mental and emotional challenges
- (Recommendation 7)

A Focus on Employment and Skills for Specific Age Groups, including paid opportunities for young people, and the introduction of "return-ships" for older workers (Recommendations 2, 3, 4, 5)

Implementation of the Green Jobs Training Recommendations in the Green Workforce Report: (Recommendations 1, 2, 3, 4, 5, 6, 7, 8):

- Investment in workforce training through work readiness and apprenticeship programs
- Recruitment from communities who face barriers to employment
- Creation of a committee of the Tompkins County Workforce Development Board, tasked with designing a comprehensive green work readiness program to precede on-the-job training

There is also scope within WIOA programs and the funds available from New York State such as the Career Pathway Training Partnerships program and the Energy Efficiency and Clean Technology Training program to source these recommendations and realize workforce development's contribution to the goal of net-zero emissions.

Promotion of an Anchor Institution Forum, with a focus on improving the workforce development challenges of the "Eds and Meds" economy, and a developing a plan to pivot from "brain drain" to "brain gain" (the retention of skilled graduates from Cornell University and Ithaca College (Recommendation 6)

As the Tompkins County vaccination schedule continues to reach our residents, we are encouraged to see the reduction of health risks and a very necessary increase in business activity. Our work to recover, repair and rebuild begins with the recommendations made in this report, and with a good deal of partnership ahead. We look forward to it.

SECTION 8
References and Further Readings

SECTION 8
References and Further Readings

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Appendix A. Summary of Statistical Data by Source

Dataset	Source	Levels of Analysis	Vintage or Timeframe	Variables
ACS PUMS	U.S. Census Bureau	Person/ Worker	2015-2019	• Occupation • Industry • Wages • Hours worked • Weeks worked • Race-ethnicity • Self-employment status • Current wowrk from home status (pre-pandemic)
O*NET Database	O*NET	Job/ Occupation	2019	• Occupation SOC code • Job outlook • Green job • Top skills by job • Most common education and experience levels by job • Matched careers for a given job
COVID-19 Job Vulnerability	New York University (NYU) Furman Center	Job/ Occupation	2019	2.49%
Teleworking	University of Chicago researchers	Job/ Occupation	2016	0.89%
Quarterly Census of Employment and Wages (QCEW)	BLS	Industry and Economy	Q1 2019- Q2 2020	1.92%
Current Employment Statistics (CES)	BLS	Industry and Economy	Monthly through Dec. 2020	2.19%
Local Area Unemployment Statistics (LAUS)	BLS	Economy	Monthly through Dec. 2020	0.68%
Long-Term Unemployment Projections	NYS DOL	Industry and Economy	2016-2026	0.90%
Occupational Wages	NYS DOL	Job/ Occupation	2020	0.74%
Longitudinal Employer Household Dynamics (LEHD)	U.S. Census Bureau	Industry	2010-2018	1.05%

Appendix B. Qualitative Interview Questions

Start by describing what we're doing: providing research to inform a new skills and employment strategy for Tompkins County. Researchers at the ILR School and Mitch Rosin are working with Natalie to map the supply and demand for skills using interviews and big data. Mention that we're also working on green jobs and racial equity, but these topics are being covered in separate interviews led by Natalie Branosky.

Demand side (employers)

1. We're talking with you because of your expertise on the demand side of the local labor market here in Tompkins County. So, please tell us how your/employer skill requirements have changed since March and skills you will need into 2021.

2. Which jobs have been hit especially hard by the pandemic? Which employers, industries and occupations are you worried about? Which jobs are gone for good?

3. What are the areas of employment growth and hiring in your industry/the County? Are these stable jobs that pay a living wage? What level of education do they require? Who is training people in these occupations?

4. Are your employees working from home? If so, how many, and which job titles? How much of this is temporary, and how much is likely to continue after the pandemic? What are the challenges of managing employees who are working from home? How has working from home affected the skills that you/employers need?

5. Are there any particular areas where skilled workers are scarce and you/employers have difficulty recruiting? What are they? Occupations? Entry- or mid-level? Do pandemic-era unemployment benefits levels (the extra weekly payment of $600) cause a problem?

6. Are there any areas where skills are too plentiful? Are you getting over-qualified applicants for the positions on offer?

Supply side (workforce development organizations)

Note: most of these interviews were with organizations that were also major employers. So we covered the demand-side topics as well.

1. We're talking with you because of your expertise on the supply side of the local labor market here in Tompkins County. So, could you tell us how worker skills on offer to employers have changed since March?

2. How do you believe the availability of skilled workers has changed since March? How effective have you been at moving courses or programs online? Have courses/programs been suspended during the pandemic? Have any courses/programs been newly created during the pandemic? Have you had to find new ways to support students/clients?

3. We are wondering about how people made unemployed by the impact of the pandemic are returning to work or finding new work. Areas of high unemployment and plentiful skills? Groups of unemployed workers who quickly get re-employed? Any examples of employers investing in upskilling their workers (e.g. to redeploy them to pandemic-related work)? Any examples of assisting workers in making their skills transfer from one occupation/industry to another (e.g. helping hospitality workers move into healthcare professions)?

4. We are wondering which skills are being lost when people drop out of the labor market. Do you see people giving up their job search because they have caring responsibilities for children or other family members, or if they are concerned about the safety of the work during a pandemic, or if they give up their job search simply because they are discouraged? What is their skills profile? Any thoughts on what kinds of skills are being lost?

5. Are your employees working from home? If so, how many, and which job titles? How much of this is temporary, and how much is likely to continue after the pandemic? What are the challenges of managing employees who are working from home? How has working from home affected the skills that you/employers need?

6. Are there any particular areas right now where you/other employers require skilled workers and are having difficulty recruiting, because the skills are scarce? What are they?

Service users (recruited with the help of the Tompkins Workforce NY Career Center)

The interviews with service users explored the following topics.

1. Basic demographic questions – age, race, ethnicity, pronouns.

2. Describe your experiences becoming unemployed and looking for work, including interactions with past and potential employers.

3. What supports did you receive – probing about unemployment and other benefits, DSS, workforce, Challenge, college, friends, family.

4. Skills, certifications and formal qualifications. How do you communicate these to employers?

5. What kind of job would you like to have?

6. How are you feeling about the future right now?

Appendix C. Survey Questions

1. Sector of activity/industry? (19 choices)

2. How has the pandemic affected the demand for the products or services provided by your company/business?

Choices: Large decrease (more than 20% less demand); Small decrease (between 5 and 20% less demand); Not much change (-5% to +5% change in demand); Small increase (between 5 and 10% increase in demand); Large increase (more than 20% increase in demand).

3.   Please indicate to the best of your ability the number of employees employed at your company at different points in time (Pre-COVID, now, expectation for June 2021, expectation for December 2021) for different positions (entry-level, mid-level [non-managerial] and senior level [managerial])

4.   Please describe the current working circumstances of current employees (insert numbers in each category if possible): Working on site as usual; Working from home; Temporarily furloughed; Hybrid (on site and work from home), for different positions (entry-level, mid-level [non-managerial] and senior level [managerial])

5.   If applicable, what have been the most substantial challenges faced by your employees while working remotely?

     Choices: Employees not set up for working remotely (office space, equipment,...); Employees not familiar with technology; Employees having to combine personal/family life with work; Time management; Connecting with colleagues; Accessing managers; Mental health / stress issues; Other (specify); Not applicable.

6.   What are the most substantial challenges you faced as a manager with employees working from home? (select all that apply)

     Choices: Communicating with employees; Training employees for remote work; Monitoring employees; Accommodating work/life balance issues; Supporting employees' health and productivity; Facilitating informal interactions; Navigating hybrid office arrangements; Other (4) (specify); Not applicable.

7.   What percent of your employees (at each level) are normally in close contact with others (other employees or customers) on a typical working day, a close contact being defined as being within a distance of 6-feet for a period of 15 minutes or more? Entry-level positions – no specific skills required; Mid-level positions (non managerial); Senior level positions (managerial).

8.   What percent of your workforce have undergone re-training during the pandemic due to changing skill requirements (0%-100%)?

9.   What type of training did they undertake (select all that apply)?

     Choices: Health and safety; Technologies associated with remote working; Other technologies; Other [please describe]

10. How did the training take place? (select on site, on line, or hybrid on site and on line)

11. Do you intend to advertise at least one position in the coming 6 months? (y/n)

12. Please indicate the title of one position that you intend to advertise in the coming 6 months.

13. Are there other positions that you intend to advertise in the coming 6 months? (y/n)

14. How many other positions?

15. Please indicate the title of one other position that you intend to advertise in the coming 6 months.

16. How many of these vacancies will be advertised as: on site; remote work; hybrid (remote work and on site); flexible (up to the worker)

17. We will now ask you more detailed questions about the types of skills you may be most in need in the future. Please indicate the skills you will be most in need.

    Choices:

    Active Learning — Understanding the implications of new information for both current and future problem-solving and decision-making.

    Active Listening — Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.

    Critical Thinking — Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

    Learning Strategies — Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things.

    Mathematics — Using mathematics to solve problems.

    Monitoring — Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.

    Reading Comprehension — Understanding written sentences and paragraphs in work related documents.

    Science — Using scientific rules and methods to solve problems.

    Speaking — Talking to others to convey information effectively.

    Writing — Communicating effectively in writing as appropriate for the needs of the audience.

    Complex Problem Solving — Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.

    Management of Financial Resources — Determining how money will be spent to get the work done, and accounting for these expenditures.

Management of Material Resources — Obtaining and seeing to the appropriate use of equipment, facilities, and materials needed to do certain work.

Management of Personnel Resources — Motivating, developing, and directing people as they work, identifying the best people for the job.

Time Management — Managing one's own time and the time of others.

Coordination — Adjusting actions in relation to others' actions.

Instructing — Teaching others how to do something.

Negotiation — Bringing others together and trying to reconcile differences.

Persuasion — Persuading others to change their minds or behavior.

Service Orientation — Actively looking for ways to help people.

Social Perceptiveness — Being aware of others' reactions and understanding why they react as they do.

Judgment and Decision Making — Considering the relative costs and benefits of potential actions to choose the most appropriate one.

Systems Analysis — Determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes.

Systems Evaluation — Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.

Equipment Maintenance — Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.

Equipment Selection — Determining the kind of tools and equipment needed to do a job.

Installation — Installing equipment, machines, wiring, or programs to meet specifications.

Operation and Control — Controlling operations of equipment or systems.

Operation Monitoring — Watching gauges, dials, or other indicators to make sure a machine is working properly.

Operations Analysis — Analyzing needs and product requirements to create a design.

Programming — Writing computer programs for various purposes.

Quality Control Analysis — Conducting tests and inspections of products, services, or processes to evaluate quality or performance.

Repairing — Repairing machines or systems using the needed tools.

Technology Design — Generating or adapting equipment and technology to serve user needs.

Troubleshooting — Determining causes of operating errors and deciding what to do about it.

18.   Please indicate the number of vacancies you have advertised since February 2020 and how these have been filled: Entry-level positions – no specific skills required; Mid-level positions (non-managerial); Senior level positions (managerial)

19.   What do you identify as the major challenges in hiring people at the moment? (select all appropriate)

        Choices: Low compensation compared to other employers; Low compensation compared to pandemic-era unemployment benefits; Exposure to disease risk at work; Uncertainty about career prospects; Workers with necessary certifications and formal qualifications are scarce; Lack of reliable transportation to work; Difficulty accommodating caring responsibilities at home (such as children and disabled relatives); Other [please specify].

20.   On a scale from 1 to 10, what scope does your company have to improve the attractiveness of the positions you have trouble finding suitable candidates for? Wages, health risks, job security, working time flexibility, flexibility in work arrangements (e.g. WFH), health and retirement benefits; other amenities.

21.   What practical support would your organization benefit most from in 2021? (select all that apply)

        Choices: HR training sessions on County COVID policies; A guided web resource on "hiring during a pandemic and beyond"; A WFH Excellence Program, specialized for workers and managers; Additional resources for equitable hiring, work retention, wage progression and career advancement; More information on simultaneous "earn and learn" options; Guidance on the definition of "a good job" now that candidate's search criteria may have changed; Other (please specify)

22.   What do you think are the chances your company/business will be open at the end of this year (31 December 2021)?

        Choices: Very Unlikely; Unlikely; I am not sure; Likely; Very Likely

23.   What do you think are the chances your company/business will be open at the end of next year (31 December 2022)?

        Choices: Very Unlikely; Unlikely; I am not sure; Likely; Very Likely

24.   Year of company creation?

25.   Name of company?

26.   Contact Details?

27.   May we contact you again to request your participation in a follow up study? (y/n)

Appendix D. Tompkins County's Largest Employers.

The County's largest employers as of January 2021 are listed below.

Name	Business Type	Approx. # of Employees
Cornell University	Education	9,496
Ithaca College	Education	1,629
Ithaca City School District	Educational	1,451
Borg Warner Automotive	Auto Parts Manufacturing	1,450
Cayuga Medical Center at Ithaca	Health Care	1,385
Tompkins County	Local Govt	716
Franziska Racker Centers	Children's Ctr	544
Wegmans Food Markets, Inc.	Commercial Foods	523
Tompkins Cortland Community College	Education	435
William George Agency (The George Junior Republic School)	Education	429
Maguire Family of Dealerships	Car Dealers	426
City of Ithaca	Local Govt	400
Dryden School District	Education	363
Tompkins Financial Corp	Financial Svcs	357
Tompkins-Seneca-Tioga BOCES	Education	351

Source: Tompkins County Area Development (TCAD), October 2019; County officials, November 2020.

Appendix E. Indicative Skills Maps for Selected Promising Occupations

This appendix contains templates for skills maps to orient job seekers, employers, and workforce development organizations in channeling job seekers into promising occupations in growing industries. These are the occupations listed in table 14, and section 5.2 describes the inclusion criteria and underlying data. The templates have been prepared for use by employers and training partners to collaborate on the fastest path for guaranteeing an interview for prospective applicants. Once agreed, the map for each occupation becomes the high-quality standard for Tompkins County.

The criteria used to identify these jobs as "potentially promising" occupations in the region are:

- The occupation is in an industry with a projected annual average growth rate greater than the average of 0.65% per year through 2026 (from NYS DOL);
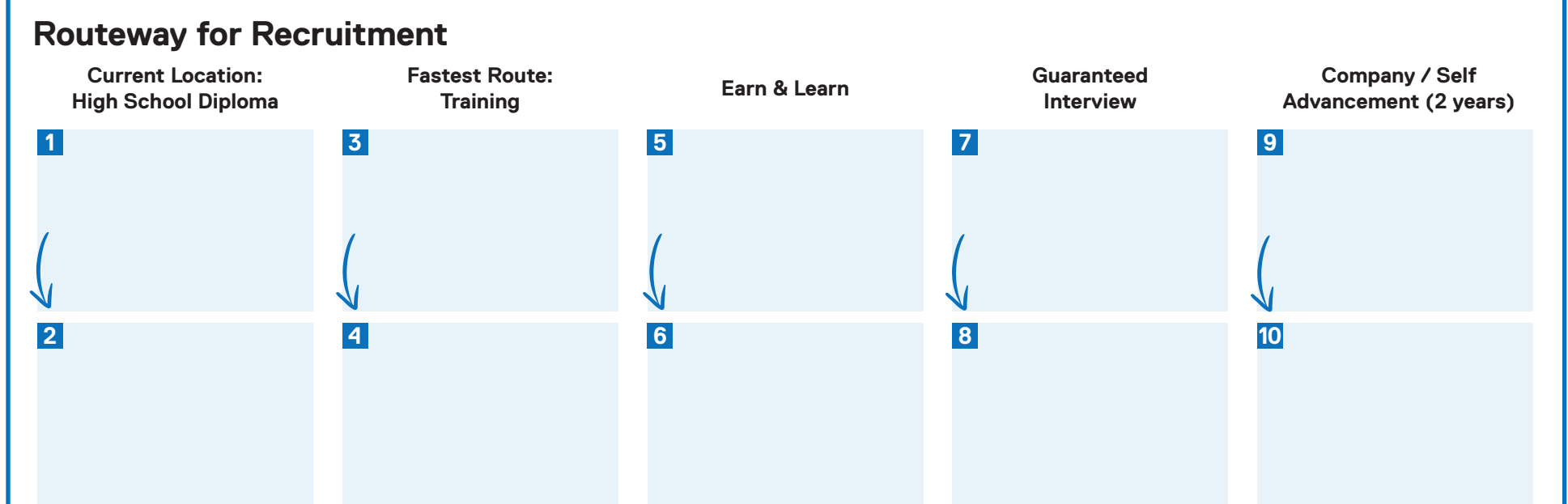
- The occupation is classified as having a "Bright Outlook" by O*NET, based on ten-year BLS projections through 2029;

- The median computed wage for existing workers in the occupation is at or above the Tompkins County living wage of $15.37 per hour; and

- The occupation is not one classified by NYU researchers as being highly susceptible ("vulnerable") to COVID-related job or income losses.

The Tompkins Pledge - High School Diploma or Equivalent / HSE +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 1	SKILLS	EXPERIENCE	REMOTE WORK	MEDIAN HOURLY WAGE
Maintenance & Repair Workers, General	1. Equipment Maintenance 2. Repairing 3. Troubleshooting	Over 1 year, up to & including 2 years	**No** # OF WORKERS **26**	**$16.27**

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: High School Diploma	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

Ithaca Area Economic Development   Workforce New York   TOMPKINS CORTLAND COMMUNITY COLLEGE   TOMPKINS CHAMBER   TOMPKINS COUNTY
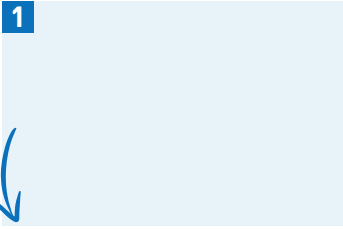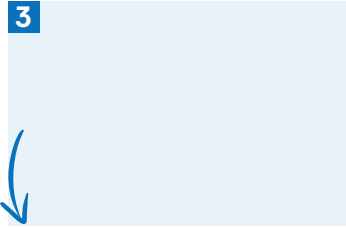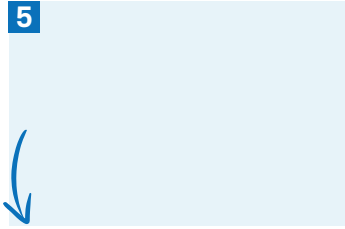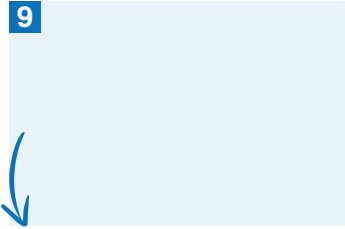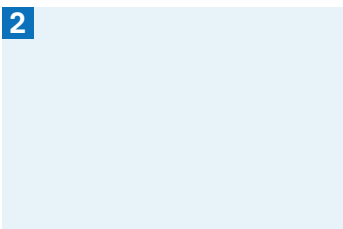
The Tompkins Pledge - High School Diploma or Equivalent / HSE +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 2 **Receptionists & Information Clerks**	SKILLS 1. Active Listening 2. Speaking 3. Service Orientation	EXPERIENCE Over 1 year, up to & including 2 years	REMOTE WORK No # OF WORKERS 80	MEDIAN HOURLY WAGE $18.47

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: High School Diploma	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	**3**	**5**	**7**	**9**
2	**4**	**6**	**8**	**10**

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

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The Tompkins Pledge - High School Diploma or Equivalent / HSE +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 3	SKILLS	EXPERIENCE	REMOTE WORK	MEDIAN HOURLY WAGE
Janitors & Cleaners, Except Maids & Housekeeping Cleaners	1. Active Listening 2. Critical Thinking 3. Social Perceptiveness	**Over 6 months, up to & including 1 year**	**No** # OF WORKERS **57**	**$16.07**

WAGE/SALARY AT ENTRY: $ _____

WAGE/SALARY AT 2 YEARS: $ _____

BENEFITS: _____

Routeway for Recruitment

Current Location: High School Diploma	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee

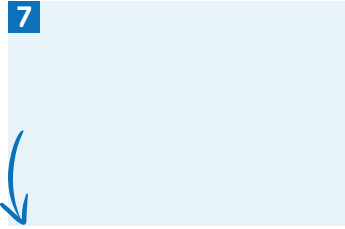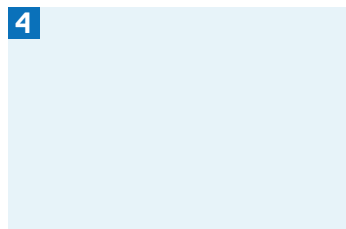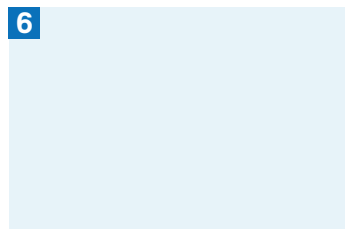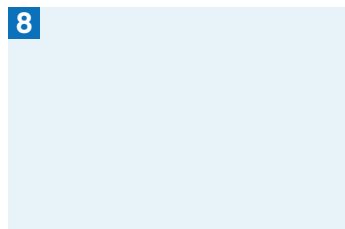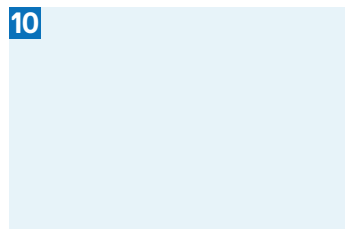Education / Training Partner

Business / Employer

The Tompkins Pledge - High School Diploma or Equivalent / HSE +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 4 **Agriculture Workers, Other**	SKILLS 1. Operation & Control 2. Operation Monitoring 3. Troubleshooting	EXPERIENCE **Over 1 year, up to & including 2 years**	REMOTE WORK **No** # OF WORKERS **33**	MEDIAN HOURLY WAGE **$19.23**

WAGE/SALARY AT ENTRY: **$** _____   WAGE/SALARY AT 2 YEARS: **$** _____   BENEFITS: _____

Routeway for Recruitment

Current Location: High School Diploma	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

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The Tompkins Pledge - High School Diploma or Equivalent / HSE +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 5 **Security Guards**	SKILLS 1. Active Listening 2. Speaking 3. Monitoring	EXPERIENCE Over 3 months, up to & including 6 months	REMOTE WORK No # OF WORKERS 20	MEDIAN HOURLY WAGE $19.84

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: High School Diploma	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

Ithaca Area Economic Development   Workforce New York   TOMPKINS CORTLAND COMMUNITY COLLEGE   TOMPKINS CHAMBER   TOMPKINS COUNTY

The Tompkins Pledge - High School Diploma or Equivalent / HSE +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 6 **Laborers & Freight, Stock & Material Movers**	SKILLS 1. Critical Thinking 2. Coordination 3. Operation & Control	EXPERIENCE Over 6 months, up to & including 1 year	REMOTE WORK No # OF WORKERS 13	MEDIAN HOURLY WAGE $24.93

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: High School Diploma	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

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The Tompkins Pledge - High School Diploma or Equivalent / HSE +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 8	SKILLS	EXPERIENCE	REMOTE WORK	MEDIAN HOURLY WAGE
Cooks, All Other	1. Active Listening 2. Service Orientation 3. Speaking	**None**	**No** # OF WORKERS **10**	**$19.41**

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: High School Diploma	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

The Tompkins Pledge - High School Diploma or Equivalent / HSE +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 9	SKILLS	EXPERIENCE	REMOTE WORK	MEDIAN HOURLY WAGE
Highway Maintenance Workers	**1. Operation & Control** **2. Operation Monitoring** **3. Monitoring**	**Over 1 year, up to & including 2 years**	**No** # OF WORKERS **37**	**$27.38**

WAGE/SALARY AT ENTRY: **$** _____   WAGE/SALARY AT 2 YEARS: **$** _____   BENEFITS:

Routeway for Recruitment

Current Location: High School Diploma	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

The Tompkins Pledge - High School Diploma or Equivalent / HSE +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 10 **Personal Care Aides**	SKILLS 1. Service Orientation 2. Social Perceptiveness 3. Active Listening	EXPERIENCE Over 6 months, up to & including 1 year	REMOTE WORK No # OF WORKERS 48	MEDIAN HOURLY WAGE $20.06

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: High School Diploma	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

Ithaca Area Economic Development   Workforce New York   TOMPKINS CORTLAND COMMUNITY COLLEGE   TOMPKINS CHAMBER   TOMPKINS COUNTY

The Tompkins Pledge - High School Diploma or Equivalent / HSE +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 11 **Home Health Aides**	SKILLS 1. Active Listening 2. Service Orientation 3. Social Perceptiveness	EXPERIENCE **Over 6 months, up to & including 1 year**	REMOTE WORK **No** #OF WORKERS **36**	MEDIAN HOURLY WAGE **$20.28**

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: High School Diploma	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

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The Tompkins Pledge - High School Diploma or Equivalent / HSE +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 12 **Nursing Assistants**	SKILLS 1. Service Orientation 2. Active Listening 3. Social Perceptiveness	EXPERIENCE **Over 6 months, up to & including 1 year**	REMOTE WORK **No** # OF WORKERS **72**	MEDIAN HOURLY WAGE **$16.40**

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: High School Diploma	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

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The Tompkins Pledge - High School Diploma or Equivalent / HSE

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 7 **Transportation Workers, All Other**	SKILLS 1. Monitoring 2. Active Listening 3. Speaking	EXPERIENCE Over 1 year, up to & including 2 years	REMOTE WORK No # OF WORKERS 12	MEDIAN HOURLY WAGE $18.60

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: Bachelor's Level	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

The Tompkins Pledge - 2-Year College Degree +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 3	SKILLS	EXPERIENCE	REMOTE WORK	MEDIAN HOURLY WAGE
Bookkeeping, Accounting & Auditing Clerks	1. Mathematics 2. Reading Comprehension 3. Active Listening	Over 2 years, up to & including 4 years	**Yes** # OF WORKERS 48	**$23.75**

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: 2-Year Degree	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

Ithaca Area Economic Development   Workforce New York   TOMPKINS CORTLAND COMMUNITY COLLEGE   TOMPKINS CHAMBER   TOMPKINS COUNTY

The Tompkins Pledge - 2-Year College Degree +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 1	SKILLS	EXPERIENCE	REMOTE WORK	MEDIAN HOURLY WAGE
Childcare Workers	1. Monitoring 2. Service Orientation 3. Social Perceptiveness	**Over 1 year, up to & including 2 years**	**Yes** # OF WORKERS **40**	**$24.76**

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: 2-Year Degree	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

Ithaca Area Economic Development   Workforce New York   TOMPKINS CORTLAND COMMUNITY COLLEGE   TOMPKINS CHAMBER   TOMPKINS COUNTY

The Tompkins Pledge - 2-Year College Degree +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 2 **Dental Hygienists**	SKILLS 1. Speaking 2. Active Listening 3. Critical Thinking	EXPERIENCE Over 1 year, up to & including 2 years	REMOTE WORK No # OF WORKERS 32	MEDIAN HOURLY WAGE $56.50

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: 2-Year Degree	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

Ithaca Area Economic Development   Workforce New York   TOMPKINS CORTLAND COMMUNITY COLLEGE   TOMPKINS CHAMBER   TOMPKINS COUNTY
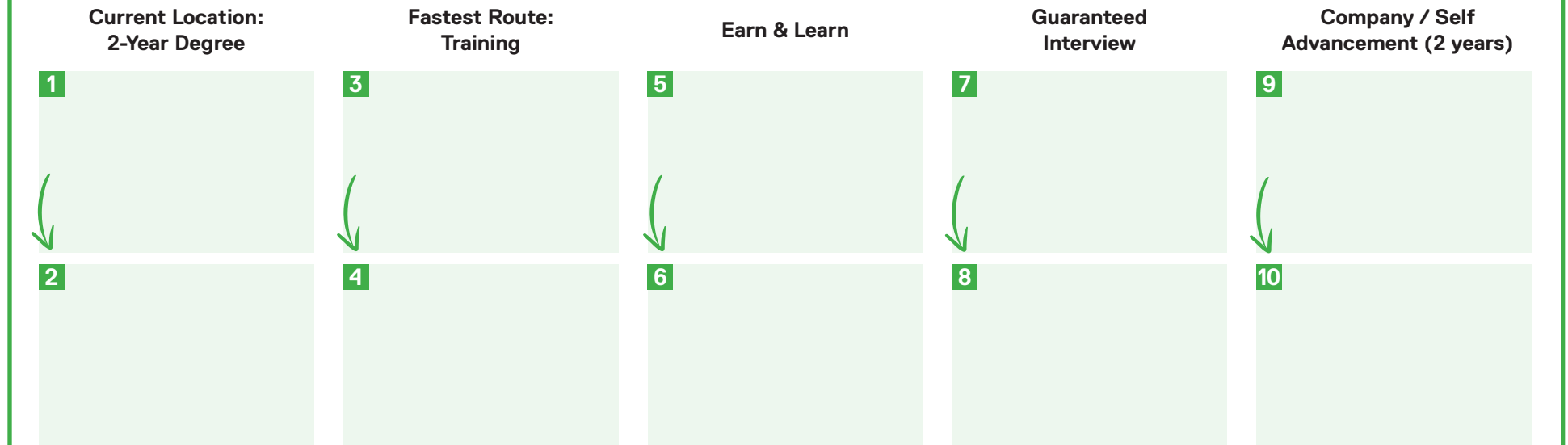
The Tompkins Pledge - 2-Year College Degree +

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HIGH DEMAND OCCUPATION 4	SKILLS	EXPERIENCE	REMOTE WORK	MEDIAN HOURLY WAGE
Office Clerks, General	1. Reading Comprehension 2. Active Listening 3. Speaking	**Over 1 year, up to & including 2 years**	**Yes** # OF WORKERS **42**	**$51.57**

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: 2-Year Degree	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

Ithaca Area Economic Development   Workforce New York   TOMPKINS CORTLAND COMMUNITY COLLEGE   TOMPKINS CHAMBER   TOMPKINS COUNTY

The Tompkins Pledge - 2-Year College Degree +

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HIGH DEMAND OCCUPATION 5	SKILLS	EXPERIENCE	REMOTE WORK	MEDIAN HOURLY WAGE
First-Line Supervisors of Construction Trades & Extraction Workers	1. Coordination 2. Active Listening 3. Speaking	**Over 6 years, up to & including 8 years**	**No** # OF WORKERS **21**	**$21.82**

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: 2-Year Degree	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

Ithaca Area Economic Development   Workforce New York   TOMPKINS CORTLAND COMMUNITY COLLEGE   TOMPKINS CHAMBER   TOMPKINS COUNTY

The Tompkins Pledge - Bachelor's Level +

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HIGH DEMAND OCCUPATION 1	SKILLS	EXPERIENCE	REMOTE WORK	MEDIAN HOURLY WAGE
Industrial Engineers	1. Reading Comprehension 2. Active Listening 3. Critical Thinking	**Over 4 years, up to & including 6 years**	**No** # OF WORKERS **53**	**$27.89**

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: Bachelor's Level	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

Ithaca Area Economic Development   Workforce New York   TOMPKINS CORTLAND COMMUNITY COLLEGE   TOMPKINS CHAMBER   TOMPKINS COUNTY

The Tompkins Pledge - Bachelor's Level +

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HIGH DEMAND OCCUPATION 2 **Technical Writers**	SKILLS 1. Writing 2. Reading Comprehension 3. Active Listening	EXPERIENCE Over 4 years, up to & including 6 years	REMOTE WORK Yes # OF WORKERS 63	MEDIAN HOURLY WAGE $54.54

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: Bachelor's Level	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

Ithaca Area Economic Development   Workforce New York   TOMPKINS CORTLAND COMMUNITY COLLEGE   TOMPKINS CHAMBER   TOMPKINS COUNTY

The Tompkins Pledge - Bachelor's Level +

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HIGH DEMAND OCCUPATION 3 **Software Developers**	SKILLS 1. Programming 2. Active Listening 3. Critical Thinking	EXPERIENCE Over 4 years, up to & including 6 years	REMOTE WORK Yes # OF WORKERS 324	MEDIAN HOURLY WAGE $46.24

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: Bachelor's Level	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

Ithaca Area Economic Development   Workforce New York   TOMPKINS CORTLAND COMMUNITY COLLEGE   TOMPKINS CHAMBER   TOMPKINS COUNTY

The Tompkins Pledge - Bachelor's Level +

The Tompkins County Workforce Development Board and partners pledge that by entering the workforce development system for the high demand occupation listed below, and completing these steps, an interview is guaranteed.

HIGH DEMAND OCCUPATION 4	SKILLS	EXPERIENCE	REMOTE WORK	MEDIAN HOURLY WAGE
Project Management Specialists	**1. Critical Thinking** **2. Reading Comprehension** **3. Active Listening**	**Over 4 years, up to & including 6 years**	**Yes** # OF WORKERS **49**	**$68.00**

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: Bachelor's Level	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	**3**	**5**	**7**	**9**
2	**4**	**6**	**8**	**10**

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

Ithaca Area Economic Development   Workforce New York   TOMPKINS CORTLAND COMMUNITY COLLEGE   TOMPKINS CHAMBER   TOMPKINS COUNTY

The Tompkins Pledge - Bachelor's Level +

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HIGH DEMAND OCCUPATION 5 **Registered Nurses**	SKILLS 1. Active Listening 2. Social Perceptiveness 3. Speaking	EXPERIENCE Over 2 years, up to & including 4 years	REMOTE WORK No # OF WORKERS 330	MEDIAN HOURLY WAGE $27.87

WAGE/SALARY AT ENTRY: $ _____   WAGE/SALARY AT 2 YEARS: $ _____   BENEFITS:

Routeway for Recruitment

Current Location: Bachelor's Level	Fastest Route: Training	Earn & Learn	Guaranteed Interview	Company / Self Advancement (2 years)
1	3	5	7	9
2	4	6	8	10

Signatures

Student / Prospective Employee   Education / Training Partner   Business / Employer

Ithaca Area Economic Development   Workforce New York   TOMPKINS CORTLAND COMMUNITY COLLEGE   TOMPKINS CHAMBER   TOMPKINS COUNTY

Endnotes

1   Dua et al., 2020

2   Flynn et al., 2017

3   Lund et al., 2020; Dingel & Neiman, 2020

4   Tran & Tuzemen, 2020

5   Dingel & Neiman, 2020

6   Schur et al. 2020

7   Bieber, 2020

8   Agarwal et al., 2020

9   IAED, 2020

10   Carlson, D. L., Petts, R., & Pepin, J. (2020). US couples' divisions of housework and childcare during COVID-19 pandemic; Kashen et al., 2020.

11   D'Emidio, 2021

12   Johnson et al., 2019

13   Cha & Skinner, 2017

14   CASE, 2020

15   Fotheringham & Wong, 1991

16   https://www.census.gov/programs-surveys/acs/microdata/documentation.html

17   https://www.onetcenter.org/database.html#all-files

18   https://docs.google.com/spreadsheets/d/18dmgZC_ sQZOc9AxETwqs7Wc9P6QmCG62y40wlFxXMMk/edit#gid=0

19   https://github.com/jdingel/DingelNeiman-workathome/

20   https://www.nytimes.com/2021/02/05/business/economy/january-2021-jobs-report.html

21   https://www.bls.gov/lau/home.htm

22   https://www.epi.org/newsroom/useful_definitions/

23   All of the data points described in this example can be found through the BLS here: https://data.bls.gov/timeseries/LASST360000000000003

24   Labor force participation was calculated relative to the size of each place's civilian noninstitutional population 16 years or older (hence the term "relative size" of the labor force). For consistency with data used throughout this section, this denominator was taken from the 2015-19 U.S. Census American Community Survey. For Tompkins County, the relevant value is 89,222 persons. For New York State, the figure is 15,912,854 persons.

25   The official measure is 58%. However, recall from above that this report is using as a denominator the size of the civilian noninstitutional population (16 years or older) from the most recent five-year Census ACS. For that reason, the values discussed here will be slightly different from the official measures, which use a different data source for the denominator.

26   https://labor.ny.gov/stats/weekly-ui-claims-report.shtm

27   https://www.bls.gov/sae/

28   Monthly jobs numbers for metropolitan regions are not seasonally adjusted. The Tompkins County data referenced in this section can be accessed at: https://data.bls.gov/timeseries/SMU36270600000000001?amp%253bdata_tool=XGtable&output_view=data&include_graphs=true

29   https://tracktherecovery.org/

30   https://www.bls.gov/cps/seasfaq.htm

31   https://inequality.org/great-divide/updates-billionaire-pandemic/

32   https://inequality.org/great-divide/updates-billionaire-pandemic/

33   https://health.ny.gov/employment/

34   https://blogs.cornell.edu/highroadpolicy/2020/05/29/free-webinar-equitable-economic-recovery-after-COVID-19-the-power-of-community-collaboration/

35   https://www.wsj.com/articles/for-black-working-women-COVID-19-has-been-a-heavy-burden-11601434755

36   Scope of Work documented from Natalie Branosky to Ian Greer, dated 8 October 2020.

37   https://www.lebow.drexel.edu/people/andrekurmann/papers/COVID-2019-employment?_gl=1*q0mido*_ga*NjQxNzI5Nzk4LjE2MTMwOTI2ODM.*_ga_6KJ1PNLE19*MTYxMzA5MjY4My4xLjEuMTYxMzA5MjcyNS4xOA...

38   Note that 438 members of this universe were exclusively self-employed; the remaining 6,096 were a mix of exclusive wage earners and wage earners with self-employment income on the side.

39 For the remainder of this section, unless otherwise noted, median hourly wages are calculated from self-reported responses from the ACS PUMS data. Respondents to the long-form ACS provide four key pieces of information that allow for estimates of their hourly wages: (1) wage or salary income in the past twelve months; (2) self-employment income in the past 12 months; (3) weeks worked during the last twelve months; and (4) usually hours worked per week during the past twelve months. Unfortunately, the way these data are recorded do not allow for straightforward computations of hourly wages. In the first place, self-reported hours worked often include uncompensated hours and/or hours worked outside of one's regular job in the form of self-employment. Second, up until 2019, the number of weeks a survey respondent reported working was collected into bins (e.g., 40 to 47 weeks, 48 to 49 weeks, 50 to 52 weeks). Therefore, one cannot simply divide annual earnings by weeks worked by usual hours worked. To overcome this issue, the research team relied on a new ACS PUMS feature for 2019, which reports the exact number of weeks that a person reported working. From the sample of Tompkins County residents who were surveyed in 2019, the researchers computed the average number of self-reported weeks worked in each of the previous (pre-2019) "bins" used by the ACS. The results were as follows: (1) average of 52 weeks worked in bin 1; (2) 48 weeks in bin 2; (3) 42 weeks in bin 3; (4) 33 weeks in bin 4; (5) 19 weeks in bin 5; and (6) 6 weeks in bin 6. These averages were applied to workers from the pre-2019 portion of the ACS sample according to their respective bin. Next, because some workers who report self-employment income alongside their wage income appeared to have included their self-employment in their hours worked, self-employment income was added to wages, where appropriate. Finally, for each worker, the sum of wages and self-employment was divided by number of weeks worked (imputed for respondents contacted prior to 2019 as described above), which was, in turn, divided by self-reported hours worked per week. Because of self-reporting, some workers will inevitably have "effective" hourly wages that are less than state and local minimum wages. Such cases are worthy of a follow-up study, insofar as they indicate potential wage theft.

40 https://www.tcworkerscenter.org/2019/05/tompkins-County-living-wage-updated-today-now-15-37-hour/

41 https://www.brookings.edu/research/reopening-america-low-wage-workers-have-suffered-badly-from-COVID-19-so-policymakers-should-focus-on-equity/

42 https://www.epi.org/publication/black-workers-COVID/

43 personal communication February 9, 2021

44 http://irp.dpb.cornell.edu/university-factbook/employees

45 https://universitybusiness.com/bidens-COVID-19-relief-plan-includes-40b-for-higher-ed/

46 https://labor.ny.gov/stats/lsproj.shtm

47 https://www.onetonline.org/help/online/browse_bright

48 Typical education level was also obtained through O*NET. O*NET data are based on occupational surveys. As such, there is no single education or experience level for any job. Rather, responses vary

across a predetermined range. For this exercise, an occupation's "common" education level was defined as the modal education level reported by O*NET respondents.

49   See the previous note. The same holds for experience levels.

50   Teleworking potential is based on Dingel & Neiman (2020).

51   Workers for whom wage data were not available were excluded from the analysis.

52   Digital literacy is not only for working from home. Navigating digital platforms is a critical skill needed to apply for jobs through application portals, access online training options, and help children with online learning. 32 Million (16%) of U.S. adults do not have sufficient comfort or competence with a computer to find a recipe, make a retail purchase, or file taxes online. American Institutes for Research, U.S. Department of Education, National Center for Education Statistics, Organization for Economic Cooperation and Development (OECD), Program for the International Assessment of Adult Competencies (PIACC), 2012)

53   One potential model is California's ICAN program (Infection Control for All Now (ICAN), Safe Workforce, Safe Workplace) provides certificates for people who complete industry-specific training courses in health and safety protocols. Source: ca-hwi.org

54   Harkavy and Hodges, 2012

55   UCSF Anchor Institution Mission Statement

56   Hodges & Dubb, 2012

57   Figueroa et al., 2011

Report to the Tompkins County Workforce Development Board

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