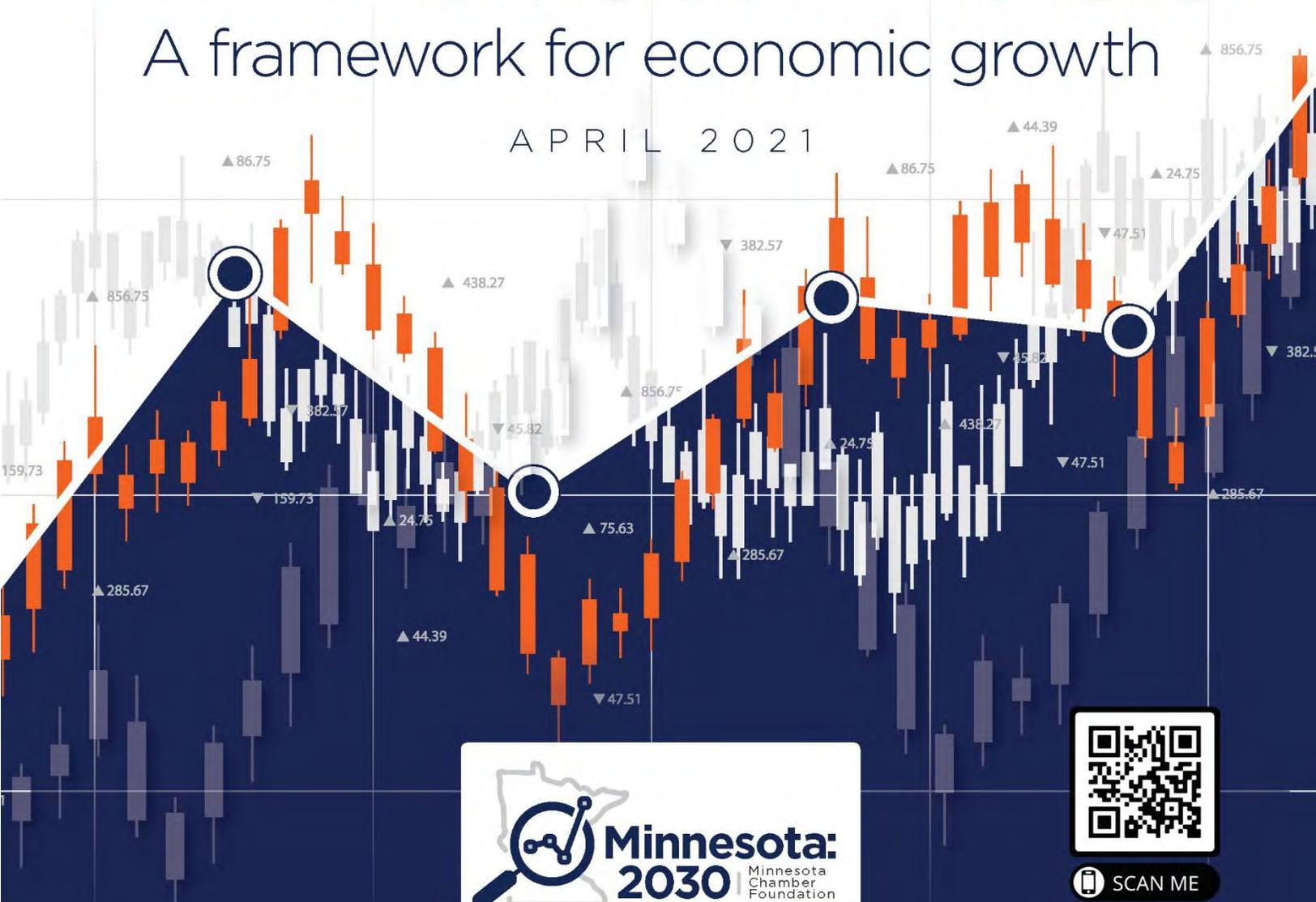


Minnesota: 2030

A framework for economic growth

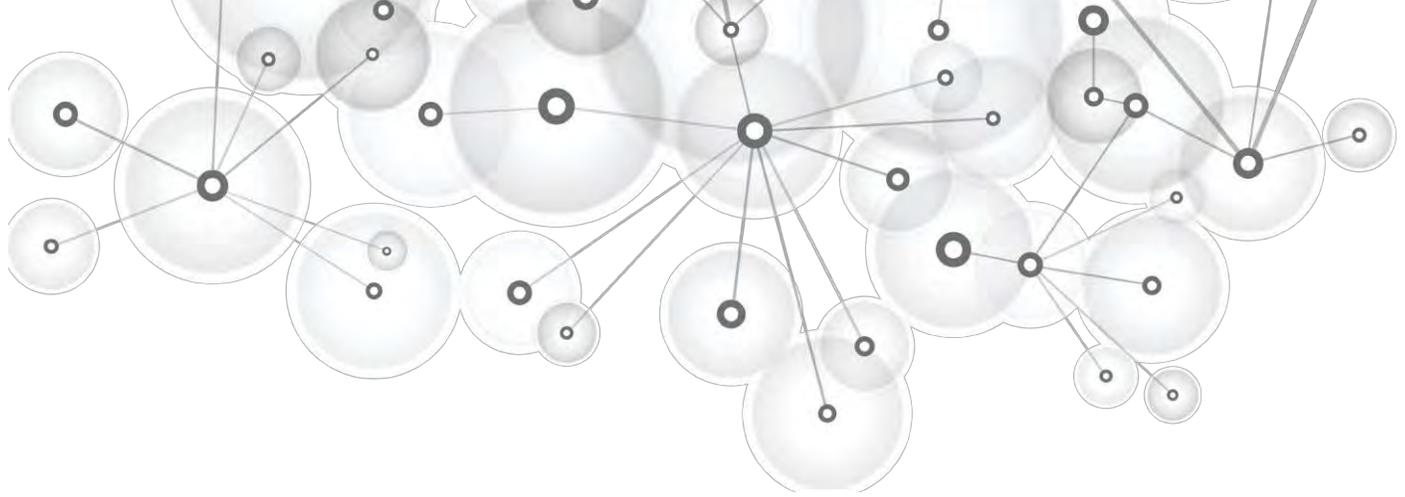
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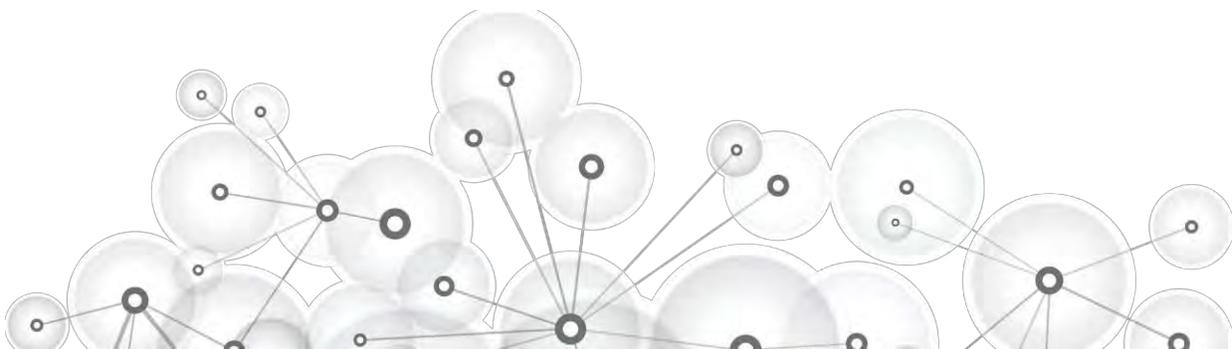
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Overview

Minnesota: 2030 outlines our position in the national and global economy with recommendations to help shape and foster stronger economic performance for Minnesota in the coming decade.

A private-sector project of the Minnesota Chamber Foundation, Minnesota: 2030 details economic strengths on which to build and potential hurdles we must work to overcome.

We overview the macroeconomic factors shaping Minnesota's economy and leverage projections to assess our economic future. The report analyzes how the state's regions act and interact, assessing industry sectors, labor and demographic trends, even freight movements.

Minnesota: 2030 advances three broad strategies for positively positioning Minnesota's economy for better growth – with actionable recommendations and growth acceleration opportunities that would further strengthen Minnesota's economy. The Minnesota Chamber Foundation is pleased to have the support of our sponsors, the guidance of our Board of Directors and the counsel of our Economic Advisors in this effort. Throughout the analysis, we're also pleased to leverage the projections and insight of leading global economics firm IHS Markit, the macroeconomic consultant for the State of Minnesota and a regular contributor to the state's biennial Budget and Economic Forecast report.

We acknowledge and credit the input and qualitative insights of the hundreds of business and community leaders who participated in dozens of focus groups and individual interviews across the state helping craft this report. We welcome the input of stakeholders statewide – inviting all Minnesotans to join us in making our economic future the best it can possibly be to 2030 and beyond.

In brief

Minnesota's economy is highly developed. The state ranks high across a range of metrics, with leading industry clusters, 16 fortune 500 headquarters, high rates of innovation and one of the highest workforce participation rates in the nation.

Minnesota's overall economic performance tells a different story, however. When comparing growth, Minnesota's economy has been trailing its peers and the U.S. economy the past two decades. GDP and job growth ranked 36th and 45th nationally in 2019. Minnesota also continued to have uneven outcomes across demographic groups and regionally, with populations of color and non-metropolitan areas experiencing lower levels of economic well-being.

Then the COVID-19 pandemic upended economies locally and around the globe. The impact on Minnesota's economy was significant, leading to unprecedented losses in employment and output. The pandemic not only changed Minnesota's

immediate economic outlook, but raised more fundamental questions related to remote work, supply chains, migration patterns and the future of urban centers.

Minnesota's resiliency and diverse industry base allowed the state to mitigate some of the worst impacts of the pandemic-induced recession. By February 2021, the state's unemployment rate ebbed to 4.3 percent and total employment reached 93 percent of pre-pandemic levels.

What lies beyond the immediate horizon? How is Minnesota poised to change – and how can businesses maximize the opportunities to advance and grow the state's economy?

- Much remains unknown. The pandemic is not yet over, and the state may be in recovery mode through 2021 or beyond. Compelling trends can be projected with a fair amount of confidence nonetheless.
- Minnesota's population and labor force growth will likely continue to slow.
- New technologies will reshape industries from manufacturing to health care to agriculture, shifting demand for skill sets in the workforce.
- Global demand for health care and food will continue to rise.
- Minnesota's population will be more racially and ethnically diverse.
- Global megatrends like climate change and resource constraints will influence economic conditions.

What can Minnesota do to help its economy navigate these changes and develop to its full potential? Minnesota: 2030 outlines three fundamental strategies: build on strengths, leverage Minnesotans and strengthen communities. Within each strategy, this report explores a range of topics, outlining the basic opportunities and challenges that lie ahead. The full Minnesota: 2030 report advances over 50 recommendations to help guide future growth efforts.

Minnesota: 2030 is the first step. Subsequent research will dive deeper into key areas. Additional ideas and more detailed prescriptions may be needed. The Minnesota Chamber Foundation will take on next steps where possible, working with partners to identify opportunities across the state to develop and grow Minnesota's economy for years to come. Private and public sector leaders should join these Minnesota: 2030 advancement efforts.

This report advances three strategies – with actionable recommendations and growth-acceleration opportunities that would strengthen Minnesota's economy.

Minnesota's highly-developed economy

Part one: How Minnesota's economy is positioned for growth this decade

Economic performance prior to COVID-19:

Minnesota entered the new decade with a highly-developed but slow growing economy. These two characteristics help explain the competing and often contradictory views on Minnesota's pre-COVID-19 economy: an emphasis on static, point-in-time measurement tends to favor the view that Minnesota's economy is strong and nationally competitive, while an emphasis on growth suggests that Minnesota's economy is falling behind and in need of repair.

Additionally, the data show uneven economic outcomes across demographic groups and regions of the state, with populations of color and non-metropolitan areas often experiencing lower levels of economic well-being. A long-term plan to grow the state's economy must therefore leverage and advance its key strengths while improving outcomes across the state's diverse regions and populations.

The severe economic impact of COVID-19 will change the growth paradigm near term as state, national and global economies recover from unprecedented losses of employment and output. IHS Markit's February 2021 economic forecast suggested that Minnesota may not reach full employment until late 2022/early 2023. That would make recovery rather than true economic growth the priority for Minnesota and the rest of the nation for the near term. With the rollout of vaccines that economic prognosis has changed, and the forecast is likely to continue shifting while uncertainty remains high.

But longer term, the trends shaping Minnesota's economic trajectory prior to COVID-19 will again be as important as before. Attention to the macroeconomic fundamentals of Minnesota's economy will strengthen both our short-term recovery and the state's longer-term prospects to 2030 and beyond.

Minnesota: 2030

A framework for growth

Three strategies – with actionable recommendations and growth acceleration opportunities that would strengthen Minnesota's economy.

Build on strengths: Further develop Minnesota's diverse economic strengths while accelerating key growth areas, such as technology and health care.

Leverage Minnesotans: Beat labor force projections and equip Minnesotans with the skills needed to succeed in a changing economy.

Strengthen communities: Help communities thrive by strengthening core assets – housing, child care, connectivity – and embracing all Minnesotans, making inclusion a strength.

A FRAMEWORK FOR ECONOMIC GROWTH

Evidence of Minnesota's highly-developed economy:

Minnesota's economy is highly developed, and characterized by its diverse industry base, hard-working and highly educated workforce, high innovation rates, industry-leading companies and above-average income levels. While an overemphasis of these traits runs the risk of masking other weaknesses in the state's economy or perpetuating the homespun narrative that Minnesota is above average at everything, a look at the data confirms that Minnesota is indeed working from a strong economic base.

Minnesota has core advantages that can be leveraged to advance the state's economy over the next decade. Below is a summary of evidence demonstrating Minnesota's economic strengths.

Exhibit 1. Characteristics of Minnesota's Highly Developed Economy

- 1 **High Value.** Per capita income, GDP per capita, and labor productivity levels. Per capita income is 105% of U.S. levels.
- 2 **Hard Working.** 2nd highest labor force participation and structurally lower unemployment rates than U.S. as a whole.
- 3 **Educated and Skilled Workforce.** 4th highest share of adults with a 2-year degree or higher.
- 4 **Innovation.** 6th most patents per capita in U.S.
- 5 **Corporate Hub.** 16 Fortune 500 headquarters and the highest concentration of Management of Companies jobs in the U.S.
- 7 **Diverse Economy.** Jobs spread across major industry sectors. 5th most diverse economy in U.S.
- 8 **Industry clusters in key sectors.** Health care and Med-tech, Food & Ag, Headquarters, Finance & Insurance, High Tech

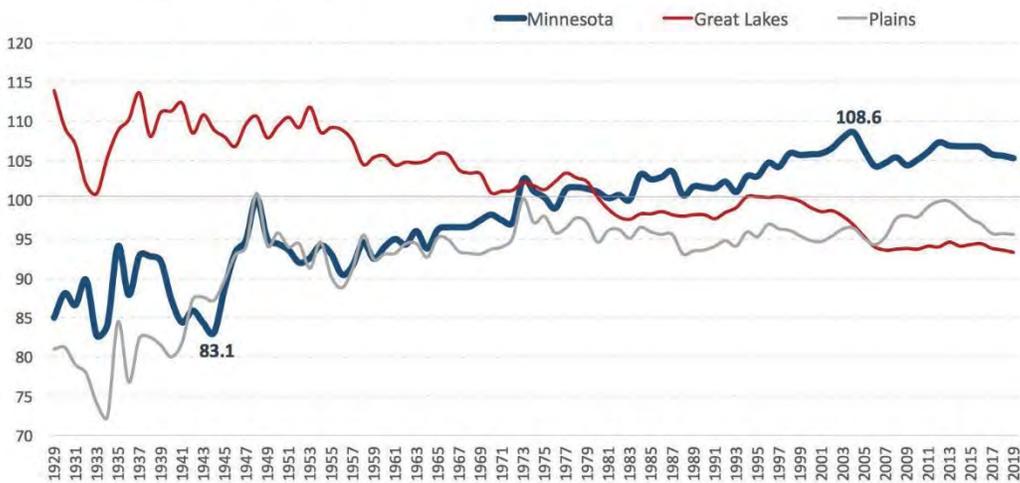
1. **High per-capita income, GDP per capita and labor productivity levels** – Since 1973, Minnesota has achieved per-capita income levels above the U.S. average and above Midwestern peers.¹ In 2019, Minnesota's per-capita income was 105.3 percent of the U.S. average. By comparison, the Plains states registered 95.6 percent, while the Great Lakes states stood at only 93.3 percent.

At \$60,066, Minnesota had the 15th highest GDP per capita nationally in 2019, above the U.S. level of \$58,107. Among Minnesota's Midwestern neighbors, only North Dakota had higher per capita GDP levels. Productivity – measured as GDP per worker rather than per-capita – ranked 22nd in the nation at \$112,000 per worker.

These measures show that Minnesota produces high value for its modest-sized population, contributing to the state's overall quality of life.

Exhibit 2. Minnesota's per capita income has stayed above U.S. levels since 1973

Minnesota per capita income as a share of U.S. levels.: 1929-2019 (100 = U.S. ave)



Source: Minnesota Chamber Foundation analysis of BEA data

- High labor force participation and low unemployment rates** – Minnesota consistently ranks in the top five states in the nation for labor force participation. In 2019, Minnesota's labor force participation rate was 70.1 percent, ranking 2nd across all states and the District of Columbia.² This is a key strength of Minnesota's economy, as broad participation in the labor market contributes to higher GDP levels, tax revenues, and reduced spending on means-tested programs.³ Thirty-four percent of Minnesota's households are two-income households, compared to the national average of 28 percent.

Historically, Minnesota also maintains a lower unemployment rate than the U.S. as a whole. Prior to the COVID-19 pandemic, Minnesota's unemployment rate was 3.1 percent, below the U.S. rate of 3.5 percent. Even during the steep downturn in 2020, Minnesota's unemployment rate rose less severely than the U.S. At the end of 2020, Minnesota's unemployment rate stood at 4.4 percent, while U.S. unemployment stood at 6.7 percent.

- Innovation and patent activity** – Minnesota is often noted for its high levels of innovation. This is evident in the state's enviable rate of developing new patents. Minnesota emerged as the patent hub of the upper Midwest in the second half of the 20th century and has continued this trend into the present.

In 2018, Minnesota received the 6th most patents per capita across all states.⁴ While medical technology drives considerable Minnesota patent activity, the state also ranks in the top 10 for patent approvals in 17 different industries.

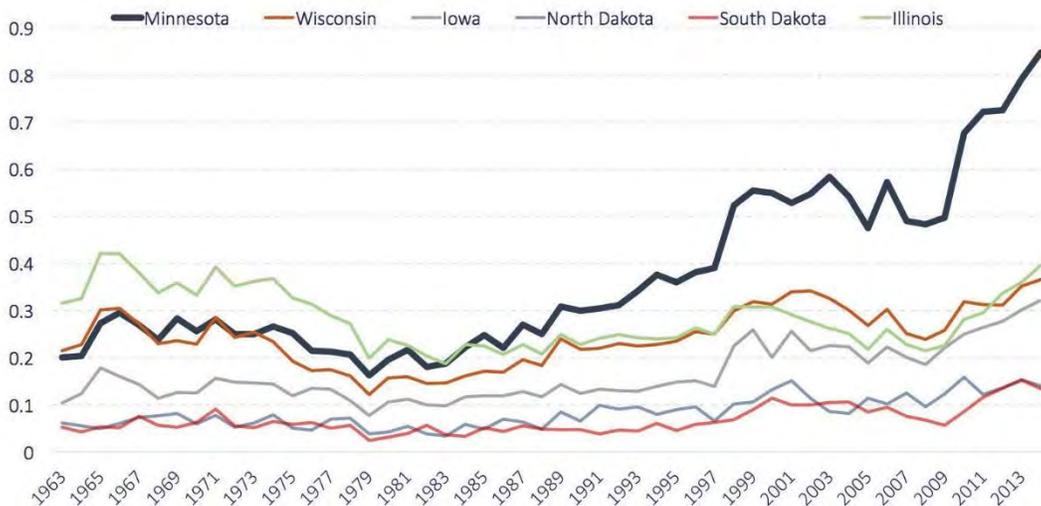
A high share of patents come from the Twin Cities metro. However, there is substantial patent activity in Greater

A FRAMEWORK FOR ECONOMIC GROWTH

Minnesota as well. Rochester in Southeast Minnesota is a regional innovation hub with the combination of IBM and Mayo Clinic delivering large numbers of new inventions and technologies. Central Minnesota also shows signs of emerging innovation. While the region only makes up a small share of the state's overall patent activity today, between 2000 and 2015 total patents increased 117 percent in Central Minnesota. In 2015 alone, the Central Minnesota region was issued more patents than 21 other entire states. Thus, there is a buildable base of innovation in the state's regional economies that can be leveraged to fuel growth in the next decade.

Exhibit 3. Minnesota is the innovation hub of the upper Midwest

Patents per 1,000 people: Midwest States



Source: Minnesota Chamber Foundation, U.S. Patent and Trademark Office

- Fortune 500 headquarters and industry leading firms** – Behind many of Minnesota's economic strengths – such as its high per-capita income levels and innovation rates – is the historical anomaly that Minnesota is one of the nation's hubs of large corporate headquarters and industry-leading firms. The state is home to 16 Fortune 500 companies and 24 Fortune 1000 companies, as well as leading privately held businesses and institutions such as Cargill, Prime Therapeutics, Taylor Corporation and Mayo Clinic.

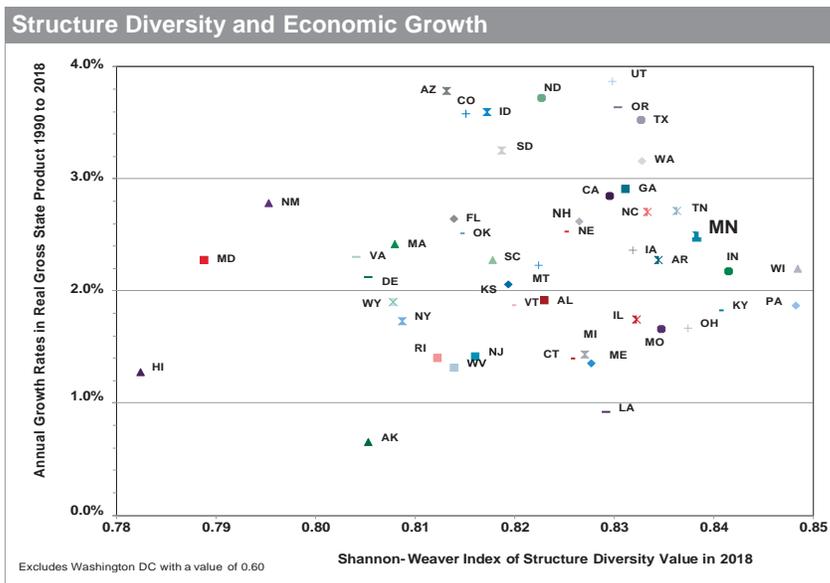
Minnesota's largest companies span a diverse range of industries, including health care, food and agriculture, retail, financial services, and durable goods manufacturing. This specialization in corporate headquarters is reflected in Minnesota's talent ecosystem. The state has the 9th highest concentration of management occupations in the country, with particular advantages in managers of marketing (1.45 location quotient), human resources (1.45LQ), purchasing (1.41LQ), industrial production (1.38LQ), finance (1.21LQ), and chief executives (1.39LQ). The same is true for financial and business operations occupations, such as credit analysts (1.42LQ), financial examiners (1.34LQ), market research analysts (1.16LQ) and management analysts (1.07LQ).

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- Economic diversity** – One of the most interesting features of Minnesota’s economy is its diverse economic structure. IHS Markit shows that Minnesota had the 5th most diverse state economy in 2018 – measured by the share of employment spread across all industries – and that it has become increasingly diverse over time. A diverse economy may help moderate swings across business cycles and buffer against major industry downturns. Yet, as the chart below shows, structure diversity does not by itself guarantee strong economic performance. Minnesota should aim to maintain its diverse economy while strengthening industries where the state has competitive advantages.

Exhibit 4. Minnesota has the 5th most diverse economy in the U.S.

Shannon-Weaver Index of Structure Diversity Value in 2018



Source: IHS Markit

- Industry clusters in key sectors** – The combination of economic diversity and leadership in advanced sectors is a key strength. Minnesota has high employment concentrations in management of companies and enterprises (i.e., headquarters), health care and medical technology, food and agriculture, electronic controls manufacturing, financial services, wood products and a variety of other manufacturing industries.

Minnesota’s global leadership in medical innovation is particularly notable. The COVID-19 pandemic certainly brought medical services, supplies and technologies to the forefront of attention for countries around the world. But medical innovation and health care leadership was a Minnesota strength even before the pandemic. Minnesota possesses high concentrations of employment and leading institutions in a broad range of activities from health care services, insurance, medical device manufacturing, with more recent growth in the emerging digital health care and biotechnology sectors.

Minnesota’s industry clusters have distinct regional characteristics, with some industries spread broadly across the state and others concentrated in particular regions. Food, health care and manufacturing span the state and tie Minnesota’s regions together, with each region possessing high concentrations of economic activity in at least one

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of these three sectors. However, each individual region also possesses characteristics and specialties that make their economic landscape distinct from the rest of the state. For instance, Northwest Minnesota has nearly 120 times the national average of transportation equipment manufacturing, and Northeast Minnesota has nearly 100 times the national average of metal ore mining jobs.

- 7. Education levels and concentrations of high skilled workers** – Minnesota has a highly educated and skilled workforce. The state ranks 4th in the share of adults (25 and over) with a 2-year degree⁵ or higher and ranks 5th in the share of adults with a bachelor’s degree or higher. Minnesota also has high concentrations of talent in key areas such as IT, STEM, Business Services, and High Tech. Exhibit 5 shows just a handful of such occupational clusters. These talent advantages are a driver for Minnesota’s economic competitiveness.

Exhibit 5. Minnesota’s concentration of specialized talent clusters.

Employment in Custom Occupation Clusters in Minnesota and Nearby States and U.S.

Occupational Group	Minnesota	Wisconsin	North Dakota	South Dakota	Iowa	Nebraska	US
ICT							
Employment	142,020	118,170	13,400	12,930	53,970	39,290	6,249,110
Share of total employ	5.05%	4.21%	3.15%	3.10%	3.52%	4.06%	4.38%
LQ	1.15	0.96	0.72	0.71	0.80	0.93	
STEM							
Employment	197,450	161,510	19,330	17,980	72,290	51,810	8,891,500
Share of total employ	7.03%	5.75%	4.55%	4.31%	4.71%	5.35%	5.24%
LQ	1.13	0.92	0.73	0.69	0.76	0.86	
Business Services							
Employment	312,480	245,450	36,890	41,240	139,030	92,940	13,945,100
Share of total employ	11.12%	8.75%	8.68%	9.88%	9.06%	9.50%	9.78%
LQ	1.14	0.89	0.89	1.01	0.93	0.98	
High technology							
Employment	310,680	342,050	39,210	39,990	155,710	92,600	13,885,580
Share of total employ	11.05%	12.19%	9.22%	9.48%	10.14%	9.57%	9.74%
LQ	1.13	1.25	0.95	0.97	1.04	0.98	
Tourism and Hospitality							
Employment	357,420	345,600	56,340	65,140	196,940	116,400	18,905,710
Share of total employ	12.72%	12.32%	13.25%	15.60%	12.83%	12.02%	13.26%
LQ	0.96	0.93	1.00	1.18	0.97	0.91	
Green							
Employment	675,050	729,030	116,600	89,590	485,190	242,120	32,697,100
Share of total employ	24.02%	25.78%	27.42%	21.44%	26.40%	25.01%	22.94%
LQ	1.05	1.12	1.20	0.93	1.15	1.09	
Arts and Culture							
Employment	46,440	41,270	5,600	5,510	20,860	13,530	2,425,530
Share of total employ	1.65%	1.47%	1.32%	1.36%	1.36%	1.40%	1.70%
LQ	0.97	0.86	0.77	0.92	0.80	0.82	
Creative Class							
Employment	1,133,550	809,590	114,160	113,770	444,100	284,070	44,501,260
Share of total employ	33.22%	28.86%	28.85%	27.10%	28.92%	29.35%	31.22%
LQ	1.06	0.92	0.86	0.87	0.93	0.94	
Service Class							
Employment	1,279,910	1,255,690	188,220	203,200	672,640	441,300	67,317,240
Share of total employ	45.54%	44.77%	44.26%	48.67%	43.75%	45.59%	47.22%
LQ	0.96	0.95	0.94	1.03	0.93	0.97	
Working Class							
Employment	593,270	734,890	121,290	99,540	413,470	238,930	30,259,600
Share of total employ	21.11%	26.20%	28.52%	23.84%	26.94%	24.68%	21.23%
LQ	0.89	1.23	1.34	1.12	1.27	1.16	
Farming, Forestry & Fishing Class							
Employment	6,680	4,840	1,560	1,630	5,310	3,690	470,520
Share of total employ	0.13%	0.17%	0.37%	0.39%	0.35%	0.38%	0.33%
LQ	0.40	0.52	1.11	1.18	1.05	1.15	

LQ = employment location quotient

ICT = Information and Communications Technology

STEM = Science, Technology, Engineering, and Math

Source: Bureau of Labor Statistics, May 2018, 2017 Occupational Employment Statistics (OES) for Minnesota
<https://www.bls.gov/oes/tables.htm>

Evidence of Minnesota’s slowing economic growth:

Minnesota’s economy grew faster than the U.S. for over three decades, with job growth exceeding the national rate in 27 of 35 years from 1970-2004. Growth accelerated at a particularly fast rate in the 1990s, as real GDP climbed at an average annual rate of 3.9 percent and employment grew at 2.2 percent. Minnesota’s per capita income grew alongside its expanding economy, reaching a peak of 108 percent of U.S. levels in 2004.

Since 2005, however, Minnesota’s economy has grown more slowly than the U.S., averaging just 1.3 percent real GDP growth and 0.7 percent job growth annually, compared to 1.8 percent and 1.2 percent respectively for the U.S. While Minnesota’s overall state rankings remained somewhat stable, it lost considerable ground to national peers in this period, with states such as Washington, Massachusetts, Colorado and North Carolina producing greater increases in Real GDP and employment.

As output and job growth slowed in the last decade, Minnesota’s per-capita income converged closer to the U.S. average, falling from 108 percent of U.S. levels in 2004 to 105 percent in 2018.

Exhibit 6. Minnesota job growth outpaced U.S. for almost three decades

Annual job growth (percent change from the previous year): Minnesota win-loss record vs. United States

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Win	W	W	W	W	W	W		W	W	W					W		W	W	W	W	W
Loss							L					L	L	L		L					
Tie											T										

	1991	1992	1993	1994	1995	1996	1997	1998	1999
Win	W	W	W	W	W			W	W
Loss							L		
Tie						T			

(Minnesota’s W-L-T record 1970-1999)

22 - 6 - 2

Source: Minnesota Chamber Foundation analysis of BEA data

Exhibit 7. Since 2000, job growth in Minnesota has trailed the U.S. in 14 of the past 20 years

Annual job growth (percent change from the previous year): Minnesota win-loss record vs. United States

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Win		W	W							W	W	W								
Loss	L				L	L	L	L	L					L	L	L	L	L	L	L
Tie				T																

Minnesota's W-L-T Record: 2000 to 2019

5 - 14 - 1

Source: Minnesota Chamber Foundation analysis of BEA data

While it is difficult to untangle the causal factors that led to the slowing of Minnesota's economy in the first two decades of the 21st century, four themes stand out in the data.

- 1. Aging demographics and U.S. regional migration trends contributed to slowing population and labor force growth.** Minnesota's hard working and highly educated workforce has been a hallmark of the state's economy for decades. The state has among the highest labor force participation rates in the country and the fifth highest share of people with a bachelor's degree or higher. These measures reflect the long-standing perception that Minnesota's workforce is "skilled of hand, steady of mind, and intensely ambitious," as Governor Orville Freeman put it in 1956.

But while the quality of Minnesota's workforce has remained strong over the years, the quantity of new workers entering the labor force has not.

Minnesota's population and labor force growth has been on a downward trend for the past two decades, leaving the state's economy without a key ingredient for expansion. This trend is not unique to Minnesota – the United States has also experienced a decades-long slowdown in population and labor force growth due to declining birth rates. Yet, the trend has been slightly more exacerbated in Minnesota than the U.S. as a whole.

Population and labor force gains helped fuel Minnesota's economic growth in the 1960s, 1970s, and 1990s. IHS Markit calculates that labor force growth moderately correlated with Gross State Product growth from 1976 to 2018, with a correlation value of .58. But by 2000, the state's labor force growth came to a near halt – averaging less than 0.5 percent growth since.

Exhibit 8. Minnesota's population and labor force growth is slowing

Annual population and labor force growth rate, Minnesota: 1990-2019 (projected)



Source: IHS Markit

Exhibit 9. Minnesota's labor force has grown slower than U.S. rate in recent decades

Annual labor force growth rate, Minnesota and United States: 1977-2029 (projected)



Source: IHS Markit

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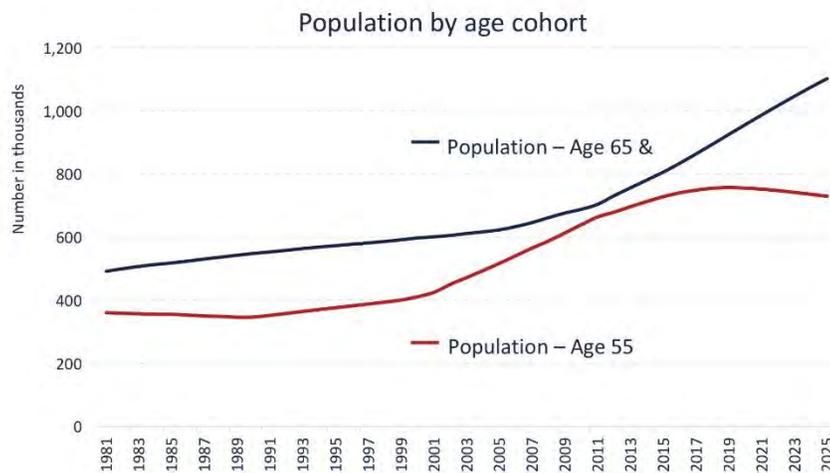
A few key factors have converged to deliver this trend.

Aging workforce: Smaller share of young adults – Minnesota’s aging workforce is a significant factor in our slowing labor force growth. The so-called silver tsunami is already leaving its mark on Minnesota’s economy, with baby boomers exiting the workforce at a high rate and a smaller number of younger workers able to backfill those age groups.⁶

Interestingly, while the share of Minnesota’s 65+ population is slightly lower than the U.S., the share of its 55+ workforce is somewhat higher. This is due in part to Minnesota’s larger 55- to 65-year-old age cohort and its high labor force participation rate for adults in this age group. But it is also due to Minnesota’s smaller than average age cohort of 20 to 29-year-olds. IHS notes that “the biggest divergence [between Minnesota and the U.S.] is in the 20-29 year old age cohorts, where Minnesota lags the U.S. by 3 to 5 percentage points. It is this age cohort that is creating the dearth in the workforce and likely where Minnesota should focus on attracting young professionals.”

Exhibit 10. Aging is contributing to Minnesota’s slowing labor force growth

Population by age cohort, Minnesota: 1981-2025 (projected)



Source: IHS Markit

Data from the Minnesota Demographic Center further shows that young people were also a major driver of domestic migration losses in recent years. Minnesotans between 18 and 24 years old were the largest contributors to net domestic migration losses after 2000, resulting in a net loss of about 9,300 Minnesotans annually to other states.⁷ As that report states, “two-thirds of Minnesota’s total annual domestic net loss is due to Minnesota students leaving for higher education, and far fewer return in the post-college years. Thus, retaining more of our college-bound young adults at in-state institutions may be a key strategy to long-term population retention and labor force development.”⁸

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This is significant for two reasons:

First, because young people entering the workforce provide the entry level talent that businesses need to scale and expand; and second, because Minnesota has a higher share of people aged 0-19, which means the state will soon have a larger share of people in their 20's.

Improving retention of the upcoming cohort of young adults is a growth strategy for Minnesota over the next decade.

Migration losses to the sunbelt accelerated as gains from the Midwest neighbors slowed – After a decade of attracting more residents to the state than it lost, Minnesota's domestic net migration turned negative in 2002, a trend that would continue uninterrupted for the next 15 years. Fortunately, an acceleration of international migration to Minnesota helped offset these losses, preventing total net migration from falling into negative territory. But declining net migration still dragged down state's labor force growth.

Conventional wisdom suggests Minnesota's cold climate is largely to blame for its domestic migration challenges. A closer look at the data reveals a more nuanced picture, however. As the following chart shows, Minnesota attracted substantial numbers of people from other states for a full decade in the 1990s.

Why did Minnesota attract more people than it lost in the 1990s, and why did this trend change direction so suddenly this century? Minnesota's weather has not gotten colder.

IRS filing data provides some insights. In the 1990s, Minnesota achieved positive net domestic migration because of substantial gains from other Midwestern states, even as it lost residents to sunbelt regions. After 2000, the rate of Midwesterners moving to Minnesota slowed while the rate Minnesotans moving to states like Florida, Arizona, California, and Colorado accelerated. The basic formula remained the same, but the gains from neighboring states simply no longer compensated for Minnesota's increasing losses to the sunbelt.

A more recent look at migration data reveals an additional explanation. Analysis from 2013-2017 Census data shows that Minnesota actually lost population to the bordering counties of neighboring states. For example, though Minnesota had positive net migration with Wisconsin overall, the state lost a net of 2,298 people to Wisconsin communities within two counties of the Minnesota-Wisconsin state border.

Net migration with North Dakota is even more telling. Minnesota lost 4,580 people to nearby North Dakota counties, with the Fargo and Grand Forks regions accounting for nearly all those losses. Unlike Minnesota's relationship with Wisconsin, where losses to western Wisconsin counties were more than offset by gains from the rest of the state, Minnesota did not attract nearly enough North Dakotans to offset its major losses to Fargo and Grand Forks.

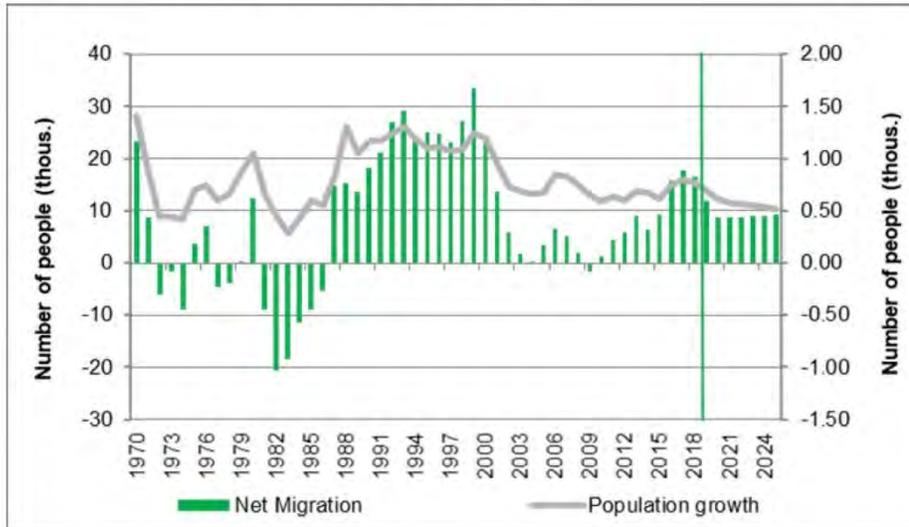
This trend held for Iowa as well, with Minnesota losing a net of 928 people to nearby counties. Only with South Dakota did Minnesota gain more residents than it lost along its border, though the state still experienced significant losses to Brookings County.

In total, Minnesota lost a net of 7,450 people to nearby counties of neighboring states.

Fixing the problem of population loss along Minnesota's border could add residents, workers, and consumers to communities around the state. It is another economic growth strategy.

Exhibit 11. Minnesota's net migration slowed after 2000

Population change and net migration, Minnesota: 1970-2024 (projected)



Source: IHS Markit, U.S. Census Bureau

Exhibit 12. Minnesota has net losses to neighboring counties nearest the state border

Net migration to out-of-state counties within two counties of Minnesota border: 2013-2017



Source: Minnesota Chamber Foundation analysis of American Community Survey data, 2013-2017

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2. Economic growth has been concentrated in a handful of sunbelt regions and coastal tech hubs this century.

A second explanation for Minnesota's slowing growth relates to the regional changes in the U.S. economy this century. In the 1990's, Minnesota's economy grew faster than the national average, with real GDP surging to 5.1 percent annually from 1997-2000. Minnesota performed equal to or better than its regional neighbors in the upper plains and great lakes economies during this period. Growth was relatively widespread at the time with nearly every U.S. region except California and the Northeast growing at moderate to fast rates.

The opposite has been true this century. Most states are seeing historically slow growth rates, while the nation's largest states, such as Texas and California, are expanding fastest.

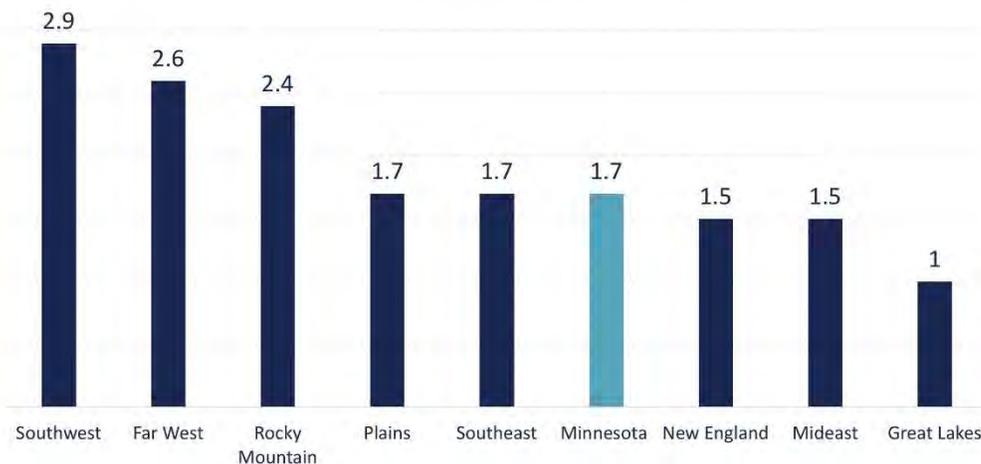
In fact, one of the major themes of the U.S. economy this century is that coastal tech hubs and a relatively small number of metros in the sunbelt have captured the lion's share of growth. Since 2000, only 40 metros in 21 states averaged above 3 percent GDP growth, and 45 of the top 100 fastest growing metro economies were in only five states: California (16), Texas (13), North Carolina (6), Florida (5), and Washington (5).

At the same time, however, Minnesota's smaller neighbors in the upper plains have grown at a slightly faster rate than Minnesota since 2000, potentially helping to explain the slowdown in regional migration to Minnesota.

Thus, Minnesota has somewhat underperformed within the region – while also not avoiding the slowing economic growth in the Midwest this century.

Exhibit 13. Economic growth has been concentrated in the sunbelt and west coast this century

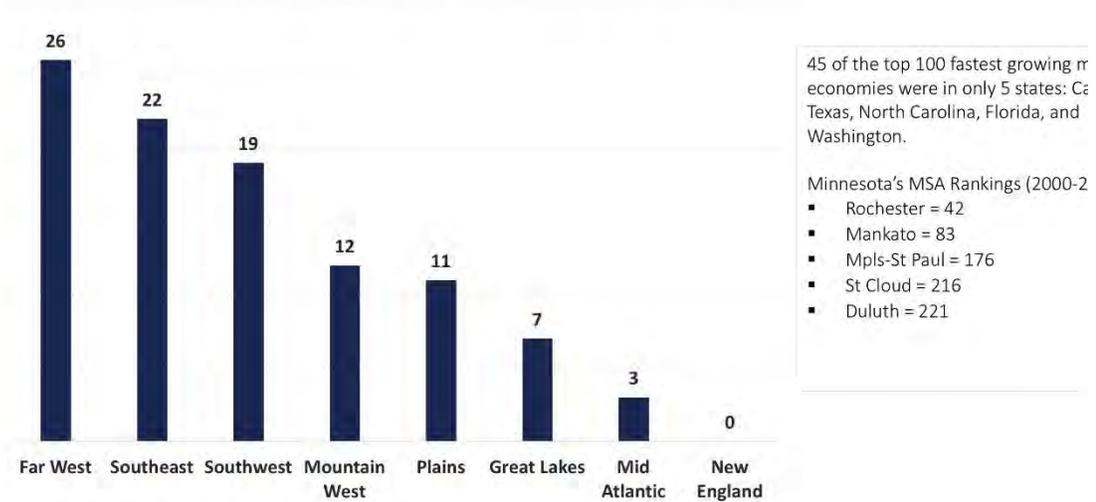
Real GDP Average Annual Growth Rate (percent change), Minnesota and U.S. BEA regions: 2000-2019



Source: Minnesota Chamber Foundation analysis of BEA data

Exhibit 14. Metros in only a handful of states have captured a large share of economic growth

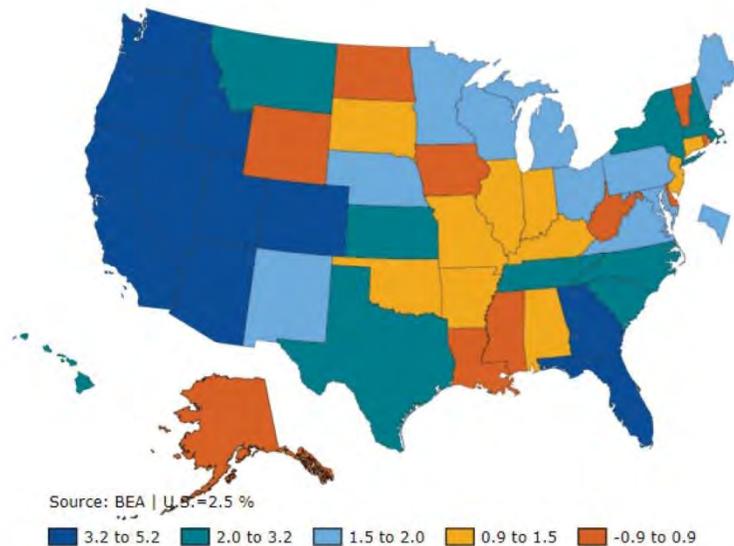
Number of top 100 fastest growing MSA's by U.S. BEA region: Real GDP CAGR, 2000-2019



Source: Minnesota Chamber Foundation analysis of BEA data

Exhibit 15. Sunbelt and western state economies grew fastest since 2014

Real GDP Growth by State, 2014-2019, Compound Annual Growth Rate



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- 3. Minnesota lost ground in high tech sectors as growth shifted to software and IT services** – Changes in technology and shifting industry trends played a role in Minnesota’s fast growth in the 1990s. The subsequent changes in those sectors also played a role in Minnesota’s slowdown in the 21st century.

IHS Markit points out that Minnesota was well positioned for the IT boom in the 1990’s, as the state’s economic ecosystem had already developed to enable high technology activities. Minnesota’s historical leadership in mainframe computing and high-tech manufacturing “provided both the business infrastructure and the skilled workforce which had been attracted to the area to support the innovation economy.”⁹

Minnesota’s employment in computer systems design actually grew faster than California’s through most of the 1990s. However, “internet and software engineer capabilities in Silicon Valley displaced other tech centers in the 21st century information economy due, in part, to the outperformance of universities like Stanford and innovative companies like Xerox,” notes IHS Markit.¹⁰ While Minnesota remained a top innovation economy in a diverse range of industries – such as health care and medical technology, corporate headquarters, and electronic instrument manufacturing – the shift from hardware to software put Minnesota at a relative disadvantage.

Looking at employment trends in 25 industries related to information technology, IHS revealed that “the level of employment in Minnesota’s IT sector began dropping sharply [after 2000] and has remained at about the same level since the mid-2000s as IT employment in the other states started to rise after a trough in 2010.”¹¹

Some of the job growth lag is explained by significant productivity gains in IT activities. Total real output in the IT sector grew at an annual rate of 2.7 percent, well above the 1.6 percent in the private sector. As a result, productivity, defined as real output per worker, rose at an annual rate of 3.8 percent in the IT sector compared to only 1 percent in the private sector as a whole.

Even accounting for these productivity gains, Minnesota’s IT sector simply has not kept pace with the nation’s tech centers, such as California and Washington. In fact, a study from the Brookings Institution shows that the Minneapolis-St Paul MSA ranked near the bottom of the top 100 largest metros in IT services job growth in recent years.¹²

The same picture emerges when looking at occupational data across all industries, not just those typically categorized as “tech or IT” industries. Data from the Bureau of Labor Statistics show that between 2010 and 2018 computer occupations grew by 17.5 percent in Minnesota, ranking 42nd across all states. In the more recent timeframe of 2014-2018, Minnesota’s state ranking dropped to 49th in IT occupational job growth at 3.7 percent.

The same general trend holds true when broadening the definition beyond just core IT activities. Looking at a broader set of 65 high-tech industries, IHS found Minnesota has an above average concentration of jobs, but below average growth rates in these activities.

In 2019, the High Technology sector in Minnesota accounted for 380,263 jobs, comprising 12.4 percent of total non-farm employment, the 13th highest share among all states and the District of Columbia, and above the U.S. share of 11.9 percent. But Minnesota’s average growth fell to only the middle of the pack – 25th across all states – trailing well behind some of its peer states such as Colorado, North Carolina, and Massachusetts.

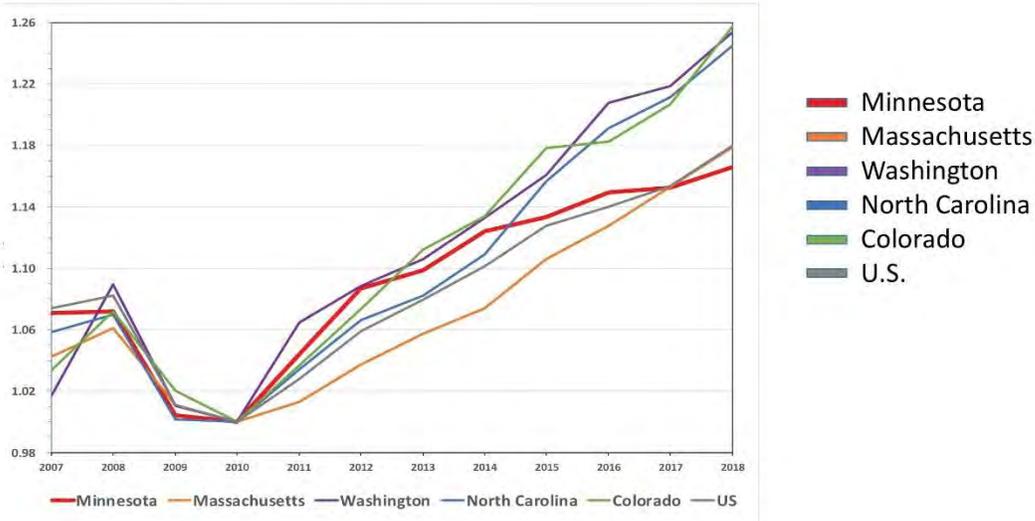
While slow growth in IT and High Tech may not be a short-term concern due Minnesota’s continued innovation

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in other areas, the state's long-term economic competitiveness could be threatened if the state continues to cede ground in these important industries.

Exhibit 16. Minnesota's high tech industries are trailing in job growth

High Tech industry employment index by state, (2010 = 1.0)

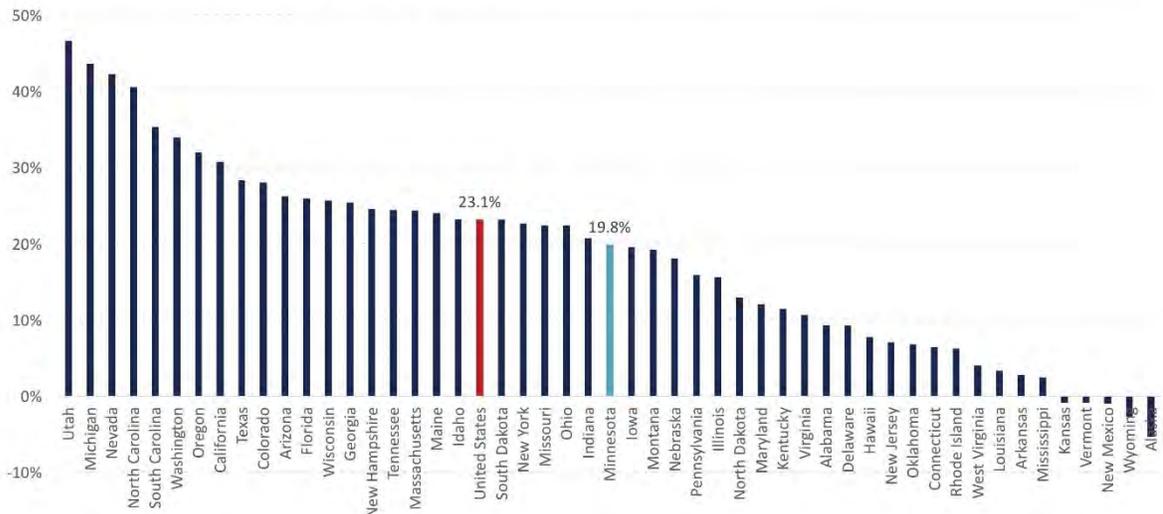


Source: IHS Markit

Note: This chart shows an aggregate of employment change among 65 high tech industries.

Exhibit 17. Minnesota lags net tech job growth across all industries, not just those considered "tech" industries

Net Tech Employment: Total percent change, 2010-2019



Source: Minnesota Chamber Analysis of CompTIA data, 2020 Cyberstates Report

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4. **Minnesota has followed national trends of falling productivity levels.** Population growth, productivity growth and economic growth are linked. In fact, the formula for economic growth is straightforward: **Productivity growth + Population growth = Economic growth**

With Minnesota's long-term slowdown in population and labor force growth, productivity plays an increasingly large role in growing Minnesota's economy.

In relative terms, Minnesota is above average in both total productivity levels and productivity growth. Minnesota had the 22nd highest productivity levels in 2018 and the 16th highest growth rate across all states since 2010. The problem is that productivity growth has fallen nearly everywhere to historically low rates since the Great Recession. IHS shows that labor productivity grew by an average of 2.7 percent from 2000-2009, but fell to just 1.1 percent after 2010.

The slowdown of U.S. productivity growth has puzzled economists and generated a range of hypotheses of what is driving this trend.¹³ One factor may be structural shifts in the industry makeup of the economy. IHS Markit notes that Minnesota's shift from manufacturing to health care services may be one example of this. Though the growth of health care services provides economic benefits to the state, the sector generates lower value-added output per worker than industries such as professional services, utilities, finance and insurance and high-tech manufacturing.

Differences across regional economies and demographic groups

Many of the economic trends described apply broadly in Minnesota's economy. However, differences exist across the state's diverse regions and demographic groups that must be accounted for to understand how the state's economy is positioned for the coming decade. Reviewing regional and demographic trends, three major themes emerged:

1. Slowing population and labor force growth has impacted rural areas most.

Reflecting national trends, Minnesota's population has shifted toward urban counties in recent years, leaving more rural parts of the state with flat or declining populations. Over 70 percent of the state's population lives in urban geographies and only eight percent in remote geographies, with this trend intensifying over time.

According to the Minnesota Demographic Center, all rural counties and rural/town mix counties have seen population declines this past decade.¹⁴ Entirely urban counties, on the other hand, have experienced modest gains in population growth since 2010 largely due to increased international migration.¹⁵ This trend has favored dense, urban regions like the Twin Cities. However, some Greater Minnesota communities have benefitted from recent population shifts as well. As the Center of Rural Policy and Development states in their 2020 State of Rural Minnesota report:

"Outside of the seven-county Twin Cities area, population growth can be found in three types of counties: counties that are considered recreational (central lakes), counties where non-white populations are concentrated (e.g. Nobles), and in metropolitan counties such as Blue Earth and Olmsted."¹⁶

As will be noted later, this presents opportunities for Greater Minnesota communities to attract population by leveraging recreation and lifestyle advantages and by attracting diverse populations. Indeed, research from Ben Winchester at the University of Minnesota has shown a persistent trend of in-migration of adults in their 30's and 40's to rural Minnesota communities, pointing to a "brain gain" phenomenon.¹⁷

The challenge of slowing population and labor growth remains substantial nevertheless. In addition to overall population loss in non-urban areas, regions outside of the Twin Cities metro have seen a sizable decrease in the share of their working age population – those between the ages of 15 and 65 – over the past two decades, putting greater strain on businesses to find workers and increasing the challenges around child care, housing, and senior care services. As IHS Markit states, "The higher the age dependency, the more productive the workforce needs to be to maintain or increase the standard of living (as measured by GSP per capita)."¹⁸

Exhibit 18. Share of core working age population (16-64 year olds) has shrunk in every Minnesota region since 2000

Dependency Ratio by Minnesota Region, 1980-2020

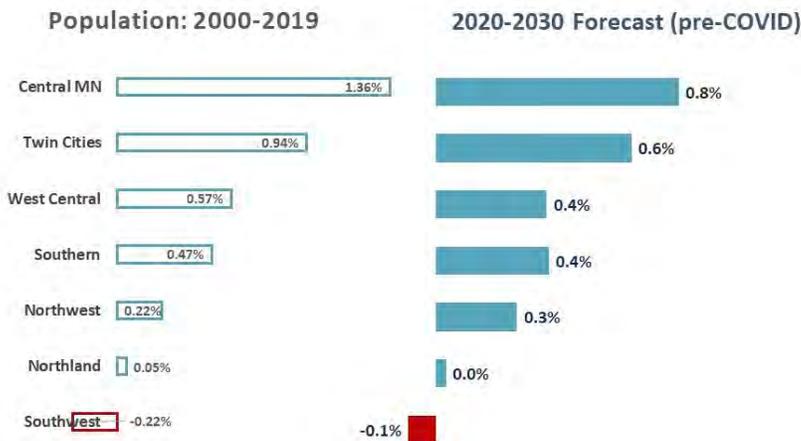
	1980	1990	2000	2010	2020
Central	60%	60%	53%	52%	59%
Northland	51%	57%	53%	51%	62%
Northwest	60%	66%	59%	58%	69%
Southern	55%	58%	54%	52%	61%
Southwest	61%	70%	63%	61%	72%
West Central	57%	63%	59%	57%	68%
7 County Twin Cities	50%	49%	46%	45%	51%

Note: The dependency ratio is the proportion of those under 15 and over 65 to those between 15-65.

Source: IHS Markit

Exhibit 19. Population growth will slow this decade

Change in total population by Minnesota region: 2000-2019 CAGR and 2020-2030 forecasted CAGR



Source: IHS Markit

These trends are likely to persist in the coming decade, with population growth expected to slow or decline in every region compared to the 2000-2019 period. Growth will continue to be strongest in the Twin Cities and Central Minnesota (driven by exurban growth in counties closest to the Twin Cities), while Northeast and Southwest Minnesota are projected to see flat or declining populations. This will likely further constrain workforce availability across the state unless regions can accelerate in-migration or increase labor force participation rates.

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2. Diversity and immigration have been an economic boost to regional economies; yet racial disparities remain a top challenge across the state.

Minnesota has undergone substantial demographic changes in recent decades.

From 2010-2019, Minnesota's populations of color grew by 32.1 percent compared to just 1.1 percent growth in Minnesota's white (non-Hispanic) population.¹⁹ While the state remains less diverse than the U.S. as a whole, Minnesota's population of color grew nearly twice as fast as the national rate.²⁰

Much of this growth has occurred in the Twin Cities metro. However, numerous Greater Minnesota counties have also attracted diverse populations in recent years, adding a vital boost to their local economies. As the Center for Rural Policy and Development states in their 2020 State of Rural Minnesota report, "The counties where these populations are concentrated in Greater Minnesota are typically the same locations that are currently experiencing population gains. This becomes more evident in the southern half of Minnesota where much of the overall population decline is concentrated except in counties with higher percentages of non-white or Latino populations (e.g., Nobles, Mower, Kandiyohi)."²¹

As stated earlier, international migration accounted for 100 percent of Minnesota's net migration gains for much of the past two decades. Growth in diverse populations thus translated to more workers, entrepreneurs and consumers in the state's economy – with international migration accounting for most of that growth.

Exhibit 20. Counties with greater racial and ethnic diversity have experienced faster population growth last decade.

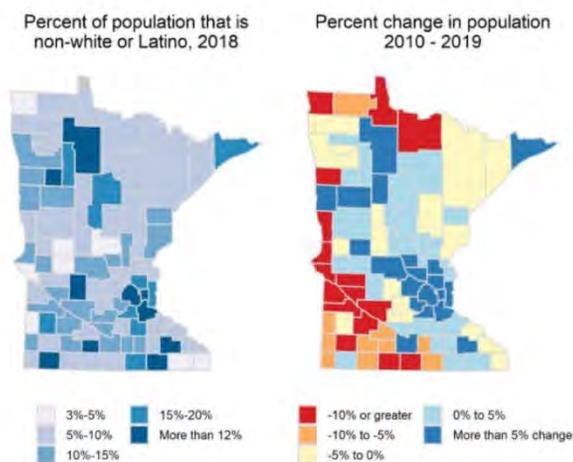
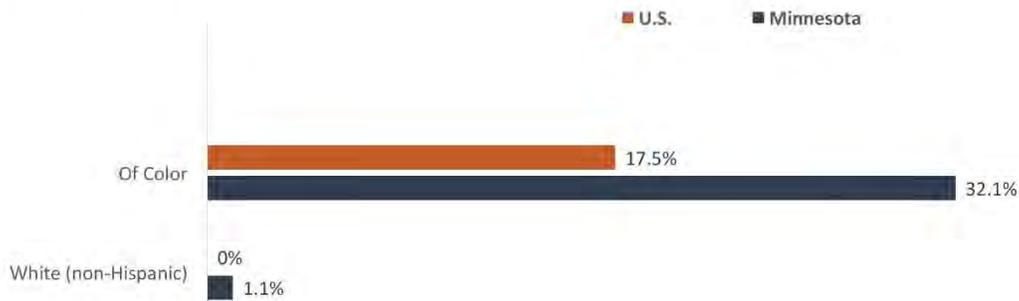


Figure 6: Non-white and Latino populations typically make up a larger percentage of the population in southern Minnesota than in northern counties. The counties with the highest percentages typically have experienced overall gains in their population as well. Data: U.S. Census Bureau, Decennial Census & Population Estimates

Source: Image taken from Center for Rural Policy and Development, 2020 State of Rural Minnesota

Exhibit 21. Minnesota’s populations of color grew 32 times faster than the white population, and outpaced U.S. rate last decade

Population change by race: Minnesota and U.S., 2010-2019



Source: Image recreated from MN Compass

Despite the positive contributions of diverse Minnesotans and new immigrants to Minnesota’s economy, the state continues to experience significant racial and ethnic disparities across a range of social and economic indicators.

Communities of color experience disparate outcomes in measures such as labor force participation, unemployment, median wages, new business formation, and educational attainment, among others. To be sure, some measures were showing improvement prior to COVID-19 and the resulting economic downturn. For example, labor force participation had increased from 62.3 percent to 72.9 percent last decade for non-white adults between 16 to 64 years old.²² High school graduation rates for students of color have also improved. And persistently tight labor markets had driven up employment and income across Minnesota’s diverse communities. But the COVID-19 downturn setback these gains.

Exhibit 22. Minnesota’s Racial and Ethnic Disparities Span Social and Economic Indicators

Selected charts from 2021 Business Benchmarks



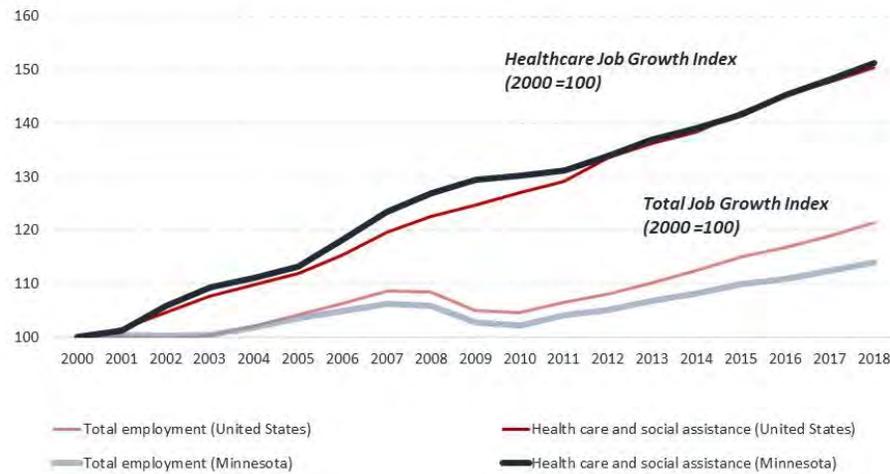
3. Food and agriculture, manufacturing, and health care tie the state’s regions together, while additional industry clusters present distinct opportunities and challenges for regional economies.

The rise of health care in Minnesota’s regional economies – A look at the economic structure of each region reveals both commonalities and differences. Most notable is the outsized role that health care has come to play across Minnesota’s economy. Each region has above average shares of jobs in Health care and Social Assistance employment, and the sector is now the largest private sector employer in 6 of 7 regions. Health care and Social Assistance ranked 3rd among all industries in job growth since 2000, increasing at an average annual rate of 2.2 percent and expanding GDP by 3.2 percent per year. This doesn’t include other verticals across the medical sector, such as insurance, devices, pharmaceuticals, or medical supplies and equipment.

Northeast and Southeast Minnesota have the highest regional concentrations of Health care and Social Assistance employment, each possessing 162 percent of the national average for employment in this sector. Growth, however, has been strongest in the most densely populated regions of the Twin Cities and Central Minnesota since 2007.

Exhibit 23. Economic shift toward health care this century

Employment index 2000-2018



Source: Minnesota Chamber Foundation analysis of BEA data

Exhibit 24. Health Care and Social Assistance Employment by Economic Region in Minnesota

	Healthcare and Social Assistance				
	Employment (2018)	Share of total regional employment (2018)	Industry rank (private sector) within region (2018)	LQ (2018)	Job Growth CAGR 2007-2018
Twin Cities	264,185	14.20%	1	1.09	+2.80%
Southern	81,802	21.20%	1	1.62	+1.40%
Central	49,285	15.50%	1	1.18	+2.30%
Northland	33,302	21.30%	1	1.62	+1.50%
Southwest	21,510	14.30%	2	1.09	+1.90%
West Central	14,672	13.90%	1	1.06	+1.80%
Northwest	11,542	14.40%	1	1.1	+1.00%

Source: IHS Markit

Manufacturing output continues to grow, even as employment declines – In contrast to health care, manufacturing employment has declined in every region since 2007, except in West Central Minnesota, which saw a modest uptick last decade. This shift from manufacturing to health care employment is a major trend in Minnesota’s economy that is projected to continue in the coming years.

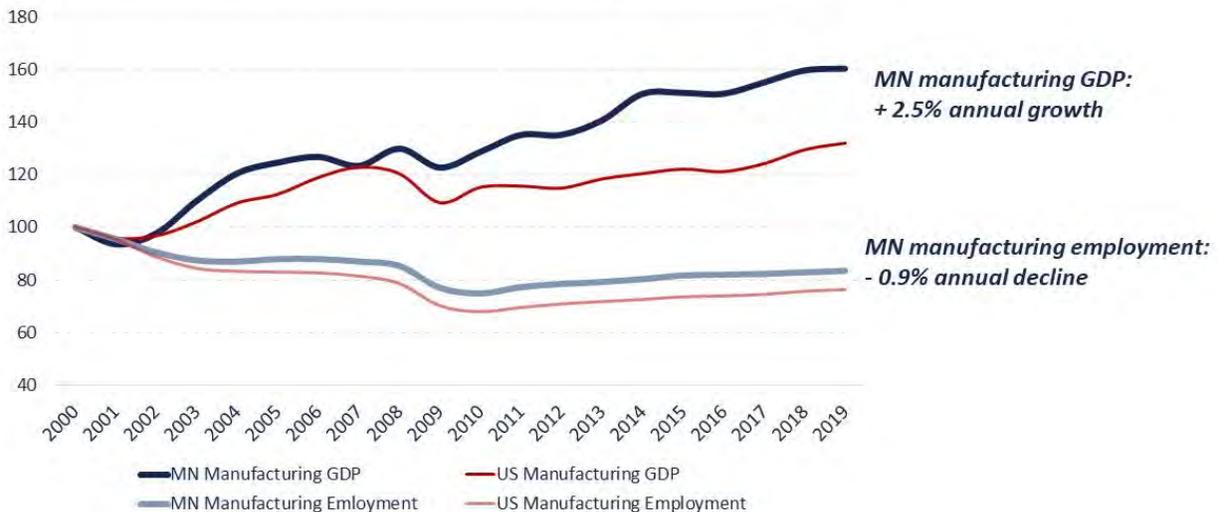
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Employment levels alone do not tell the full story, however. Automation and shifts toward higher value goods have helped Minnesota manufacturing grow its output value even as employment has declined. This is seen in the chart below. Minnesota's manufacturing GDP increased by 2.5 percent annually since 2000, while manufacturing employment actually fell by -0.9 percent.

Notably, Minnesota's manufacturing sector outperformed U.S. manufacturing over the past two decades.

Exhibit 25. Minnesota manufacturing output expands while employment falls – state outperforms U.S. manufacturing sector

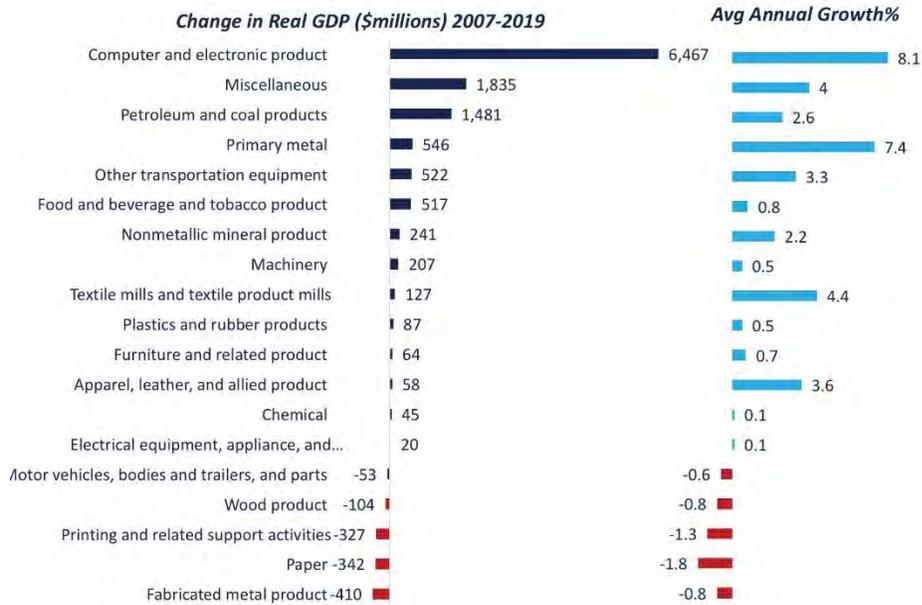
GDP and Employment Index (2000 = 100): Minnesota and U.S. manufacturing sector



Source: Minnesota Chamber Foundation analysis of BEA data

This has significant implications for the state's regional economies. Each region except Northeast Minnesota has an above average share of manufacturing jobs. The state's manufacturing sector is also diverse, with regions like Northwest Minnesota specializing in window manufacturing and transportation equipment while Southwest Minnesota specializes in food processing and agriculture equipment and machinery. We will discuss various regional specializations further, but the diversity of Minnesota's manufacturing sub-sectors means each region has different challenges and opportunities relative to future performance in its manufacturing sector. For example, GDP in the state's printing industry declined over the past decade, falling at an annual rate of -1.3 percent since 2007. On the other hand, total output value in computer and electronic product manufacturing expanded at a rapid 8.1 percent annual rate over the same time frame due to the state's strong medical device and electronic instrument sectors. These differences have variable impacts for regions across the state based on their own industry mix.

Exhibit 26. Minnesota Manufacturing Sector (Change in GDP)



Source: Minnesota Chamber Foundation analysis of BEA data

The paradox is that while manufacturing employment has declined overall, manufacturing businesses have reported increasing difficulty finding workers in recent years.²³ This presents both a challenge and opportunity for regional economies looking to support continued growth in the manufacturing sector, as new technologies and automation are likely to change the skillsets needed in factory settings.

Food and Agriculture remains a major asset and ties the regions together through intrastate trade – Food processing and agricultural production present regional economies with a high degree of specialization and competitive advantages. According to a 2020 report by AgriGrowth, the state’s food and ag sector delivered an economic impact of \$88.8 billion in total sales, \$29.7 billion in value-added output and supported 320,000+ jobs.²⁴ This represents eight percent of the state’s workforce and 9 percent of state GDP. The range and breadth of Minnesota’s food industry includes not just crop, dairy and livestock production, but also value-added activities such as grain milling, livestock processing, food manufacturing and food marketing.

Minnesota’s food sector ties together the state’s diverse economic regions, with a significant \$16.9 billion in food and farm products being traded within the state. Food and kindred products are among the top 10 originating commodities for six out of seven regions, and \$8.3 billion of farm products flowed within the state in 2017. As IHS Markit notes, this high level of trade in food products across Minnesota’s regions demonstrates clear regional interdependencies.²⁵

Minnesota’s food and ag sector goes beyond farms and processing plants. The state is also a national and global hub for food innovation, technology, management, marketing, sales, distribution and retailing.

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Regional industry clusters present both risks and opportunities –Minnesota’s economic regions possess distinct industry concentrations that may not be reflected in statewide data. For example, Minnesota’s share of jobs in the mining industry is well below the U.S. average. However, Northeast Minnesota’s metal ore mining industry has a location quotient of 96.7, meaning the Northeast region has a concentration of jobs in this industry over 96 times higher than the U.S. average. Regional specializations such as these are a critical component of Minnesota’s current and future economic opportunities.

Exhibit 27 shows industries in each region that have both high concentrations of jobs relative to the national average and account for substantial total employment in the region. These industries offer distinct opportunities and challenges and should be part of any regional economic strategy. (See appendix for a complete list of highly concentrated regional industries.)

Exhibit 27. Minnesota Regional Industry Specialization

7-County Twin Cities (highest LQ of industries > 5,000 ee)

Industry	Total Employment	Location Quotient	Long Term Job Growth (2000-2018)	Recent Job Growth (2014 to 2019)	US Output Forecast Quartiles (2018 to 2028)
Electronic Instrument Mfg.	29,135	5.61	+1.47%	+1.9%	4
Medical Eq. & Supplies Mfg.	18,063	4.67	+1.53%	+0.2%	3
Support Activities - Printing	17,107	3.28	-2.32%	-1.4%	1
Advertising & Related Services	15,297	2.58	+1.23%	+2.7%	3
Management of Companies & Enterprises	73,450	2.56	+1.03%	+0.3%	1

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Central MN (highest LQ of industries > 1,000 ee)

Industry	Total Employment	Location Quotient	Long Term Job Growth (2000-2018)	Recent Job Growth (2014 to 2019)	US Output Forecast Quartiles (2018 to 2028)
Household & Institutional Furniture Mfg.	2,918	5.96	-1.4%	+1.7%	3
Psychiatric & Substance Abuse Hospitals	2,171	5.60	+6.4%	+11.7%	4
Machine Shops Mfg.	3,378	4.42	+2.9%	+2.4%	1
Motor Vehicle Body & Trailer Mfg.	1,260	4.04	-1.1%	+0.3%	2
Other Wood Manufacturing	1,877	3.76	-0.5%	+3.9%	4

Northeast MN (highest LQ of industries > 500)

Industry	Total Employment	Location Quotient	Long Term Job Growth (2000-2018)	Recent Job Growth (2014 to 2019)	US Output Forecast Quartiles (2018 to 2028)
Metal Ore Mining	4,063	96.73	-2.2%	-2.7%	3
Pulp, Paper & Paperboard Mills	1,866	19.30	-4.5%	-4.1%	1
Rail Transportation	1,778	9.03	-0.8%	-4.5%	3
Other. Residential Care Fac.	746	5.93	+1.1%	+4.3%	3
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	3,670	4.89	+4.8%	-1.6%	4
Power Generation & Supply	1,285	3.18	-0.1%	-0.7%	1

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Northwest MN (highest LQ of industries > 500)

Industry	Total Employment	Location Quotient	Long Term Job Growth (2000-2018)	Recent Job Growth (2014 to 2019)	US Output Forecast Quartiles (2018 to 2028)
Other Transportation Eq. Mfg.	998	119.87	+0.8%	-2.3%	1
Other Wood Manufacturing	2,732	21.73	-1.9%	-3.8%	4
Sugar & Products Manufacturing	769	16.44	+0.7%	+0.9%	4
Wholesale - Electrical Goods	3,160	14.62	+6.4%	+3.2%	3
Crop Production	6,183	8.49	-1.4%	+0.7%	2

Southeast MN (highest LQ of industries > 1,000)

Industry	Total Employment	Location Quotient	Long Term Job Growth (2000-2018)	Recent Job Growth (2014 to 2019)	US Output Forecast Quartiles (2018 to 2028)
Grain & Oilseed Manufacturing	1,933	12.21	0.0%	+1.9%	3
Vocational Rehabilitation Services	6,363	7.48	+5.3%	+2.0%	1
Dairy Product Manufacturing	2,864	7.26	-0.4%	+2.9%	3
Wholesale - Farm Products	1,036	6.06	+0.2%	+0.5%	2
Animal Slaughtering & Processing	7,266	5.28	+0.7%	+1.6%	3

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Southwest MN (highest LQ of industries > 500)

Industry	Total Employment	Location Quotient	Long Term Job Growth (2000-2018)	Recent Job Growth (2014 to 2019)	US Output Forecast Quartiles (2018 to 2028)
Wholesale - Farm Products	1,297	19.41	-0.2%	-3.4%	2
Animal Slaughtering & Processing	6,719	12.49	+1.1%	+1.6%	3
Ag., Construction, & Mining Machinery	2,871	12.44	+1.0%	+1.7%	4
Animal Food Manufacturing	753	12.06	+6.3%	+0.8%	4
Crop Production	12,944	9.44	-1.0%	+1.0%	2
Converted Paper Products	2,358	9.17	+0.2%	0.0%	1

West Central (highest LQ of industries > 500 ee)

Industry	Total Employment	Location Quotient	Long Term Job Growth (2000-2018)	Recent Job Growth (2014 to 2019)	US Output Forecast Quartiles (2018 to 2028)
Other Machinery Mfg.	2,432	13.14	+1.9%	+5.2%	2
Wholesale - Farm Products	570	12.34	+2.4%	+0.5%	2
Forging & Stamping	833	10.77	+4.9%	-3.0%	2
Sugar & Products Manufacturing	612	10.05	+0.4%	-3.3%	4
Crop Production	7,403	7.81	-0.5%	+1.2%	2

2020 impacts on Minnesota's economy

The events of 2020 – most notably the COVID-19 pandemic – created shockwaves across the global economy. Minnesota experienced significant economic impacts amidst these difficult circumstances, with employment and output declining at unprecedented rates in March and April before beginning a steep climb toward recovery in subsequent months. Minnesota also found itself at the center of a national reckoning over long-standing racial inequities in policing with the death of George Floyd and ensuing civil unrest. Taken together, these events not only produced short-term challenges to overcome, but also raised longer term questions that must be thoughtfully addressed by businesses, policymakers, and civil society. Some of these issues – such as remote working, talent mobility, commercial real estate activity in urban centers, and large-scale diversity and inclusion efforts – could signal deeper shifts in Minnesota's economy. As will be addressed later in this report, Minnesota must carefully assess changing trends and respond effectively if the state is to achieve its full potential this decade.

2020 economic performance and impact

Minnesota reported its first case of the novel coronavirus on March 6. Within weeks, Minnesota went into a statewide lockdown, and by the end of April – a mere seven weeks after the first reported case – Minnesota had lost over 13 percent of its total employment and nearly 614,000 Minnesotans had filed claims for unemployment insurance, marking the steepest economic downturn in over seventy years.

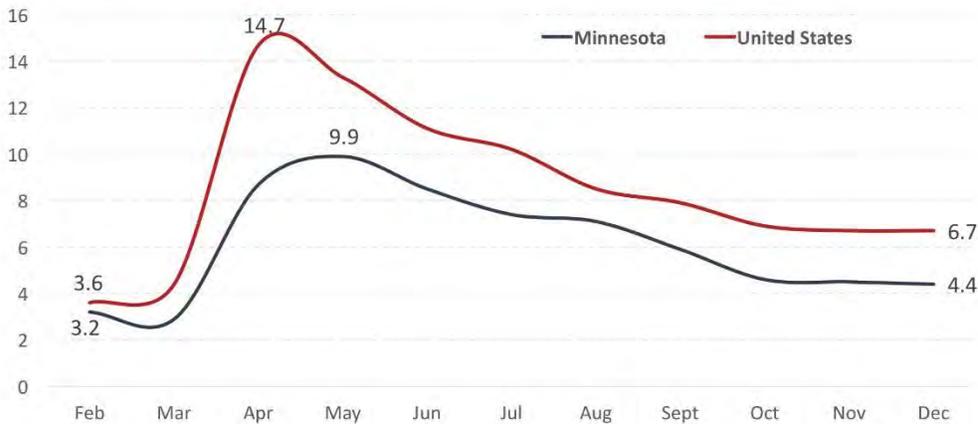
Because the sudden halt in economic activity was caused by deliberate measures to slow the spread of COVID-19, many job separations were expected to be short-term in nature, taking the form of temporary furloughs rather than permanent lay-offs. As such, the official unemployment rate did rise, but not in proportion to the unprecedented spike in initial unemployment insurance claims. The U.S. unemployment rate peaked in April at 14.7 percent before receding steadily to 6.7 percent by the end of 2020. Minnesota's unemployment peaked at a lower rate of 9.9 percent in May and fell to 4.4 percent by December, remaining well below national unemployment levels throughout the year.

Overall, Minnesota's changes in employment and GDP reflect national trends. The state's total employment declined slightly less than the U.S. in April, falling to 86.8 percent of pre-COVID-19 (January 2020) levels. However, after six consecutive months of job recovery, Minnesota's employment ticked down in November and December, leaving the state at 91.5 percent of full strength and trailing the U.S. recovery. By the end of 2020, Minnesota still needed to add 246,100 jobs to recover to 2019 levels.

Minnesota's GDP contracted by 31.3 percent in the second quarter before bouncing back by an unprecedented 36.3 percent in Q3 of 2020. However, the scale of initial losses in output means that Minnesota – like the U.S. economy – must continue posting substantial gains before reaching full recovery.

Exhibit 28. Minnesota unemployment rate remains below U.S. levels

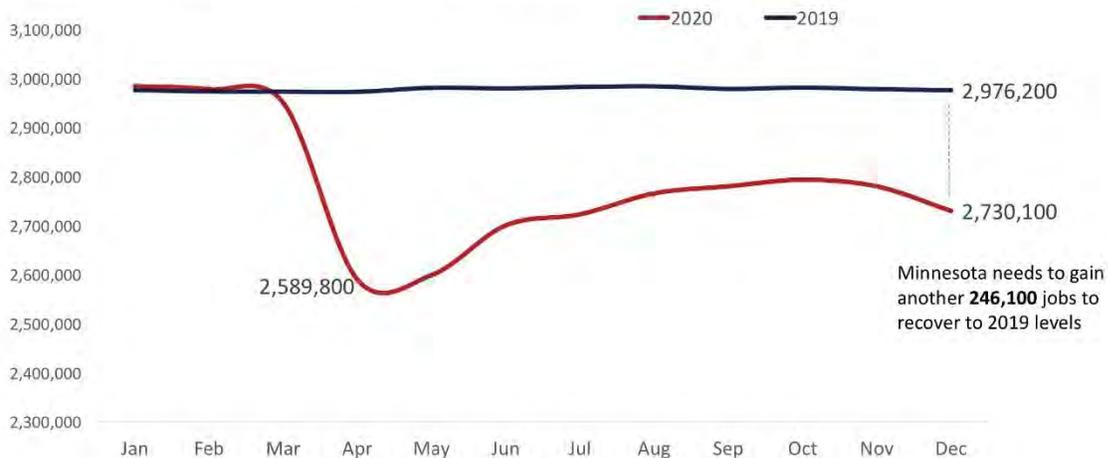
Unemployment Rate (seasonally adjusted): Minnesota and U.S., February 2020-December 2020



Source: Minnesota DEED, Bureau of Labor Statistics

Exhibit 29. Minnesota ended 2020 over 246K jobs short of 2019 levels

Minnesota monthly total employment (seasonally adjusted): 2019 and 2020



Source: Minnesota DEED, Bureau of Labor Statistics

Exhibit 30. Minnesota GDP plunged by 31% in Q2 2020 before rebounding by 36% in Q3

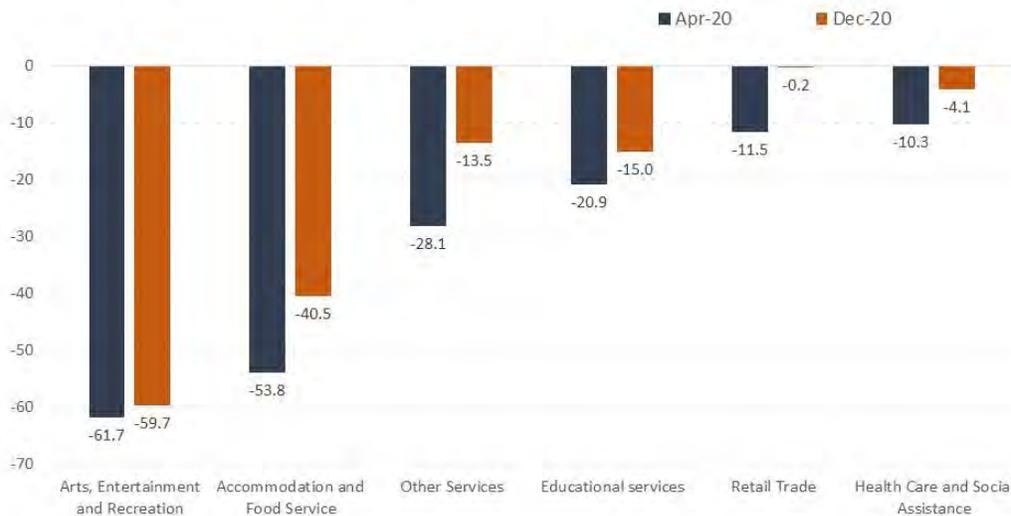
Real GDP (percent change from preceding period): Minnesota and U.S., Q1 2019-Q3 2020



Source: Minnesota Chamber Foundation analysis of BEA data

Exhibit 31. Uneven recovery among Minnesota's hardest hit industries

Percent change in total employment (annualized) April 2020 and December 2020



Source: Minnesota DEED, Bureau of Labor Statistics

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Sector, regional and demographic impacts

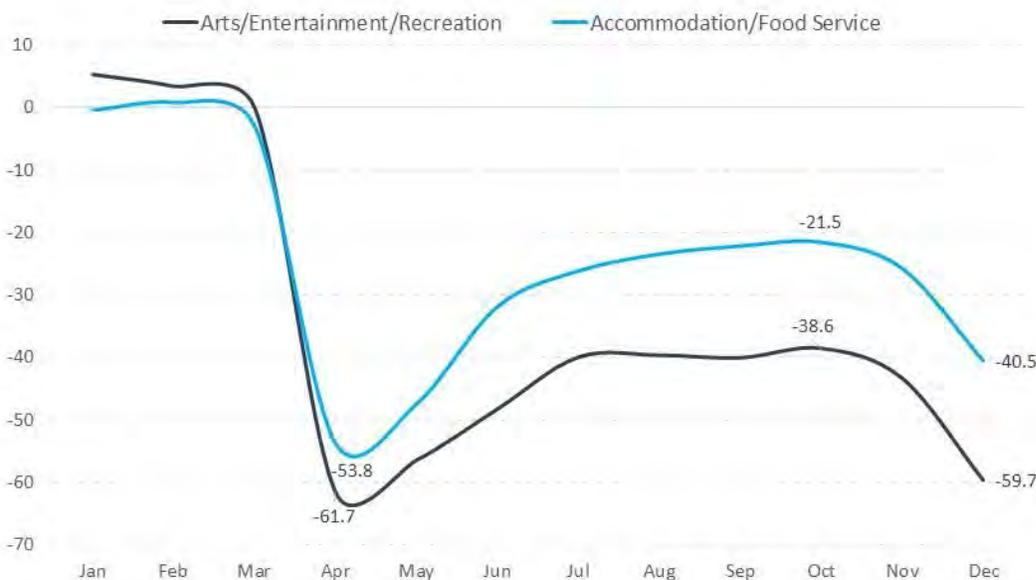
The COVID-19 recession led to job losses in every major sector of Minnesota's economy. Impacts were concentrated in certain industries and demographic groups, however. Local services, travel oriented industries, young people and employees of color all experienced disproportionate impacts. Leisure and hospitality lost over half of its total jobs, with industries like full-service restaurants declining nearly 75 percent. Regions with greater shares of activity in these hard-hit industries were also impacted significantly. For example, unemployment rates in Northeastern Minnesota's Arrowhead region were more than double that of the state's Southwest region.

Minnesota's small businesses were hit hard by the pandemic and public health response as well. The Minnesota Chamber Foundation's Economic Recovery Dashboard launched in July showed that the number of Minnesota small businesses open decreased by 40 percent from January to April 2020, and small business revenue fell by over 51 percent.

By December, the state's hardest hit industries had taken divergent trajectories, with some industries, like Retail and Health Care and Social Assistance, climbing back to just -0.2 percent and -4.1 percent below 2019 levels respectively. However, other hard-hit industries, remained far below pre-COVID-19 levels. Part of this may be due to seasonal effects and policy measures that caused industries like Accommodations/Food Services and Arts/Entertainment/Recreation (which together make up the Leisure and Hospitality sector) to backslide from previous gains made over the summer and early fall months.

Exhibit 32. Leisure & Hospitality industries continue to be impacted by pandemic and government interventions

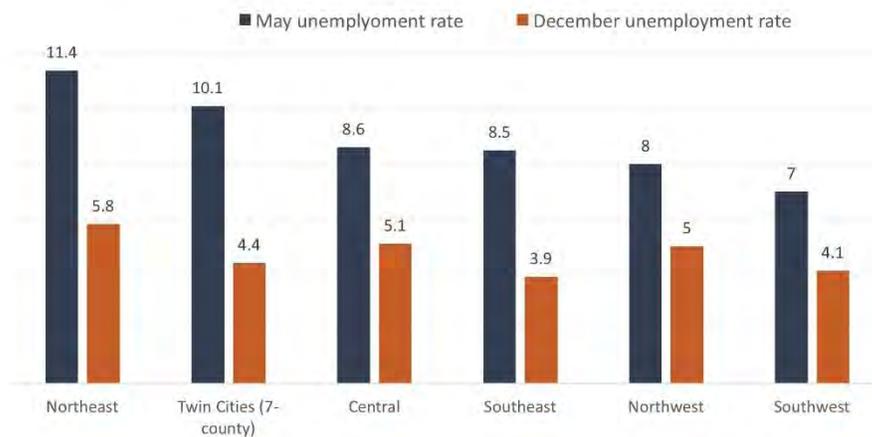
Percent change in monthly total employment (annualized) by industry: January 2020 – December 2020



Source: Minnesota DEED, Bureau of Labor Statistics

Exhibit 33. Unemployment rate across Minnesota’s regional economies converged modestly from May to December 2020

Unemployment rate by Minnesota region*: May 2020 and December 2020



Source: Minnesota DEED, Bureau of Labor Statistics

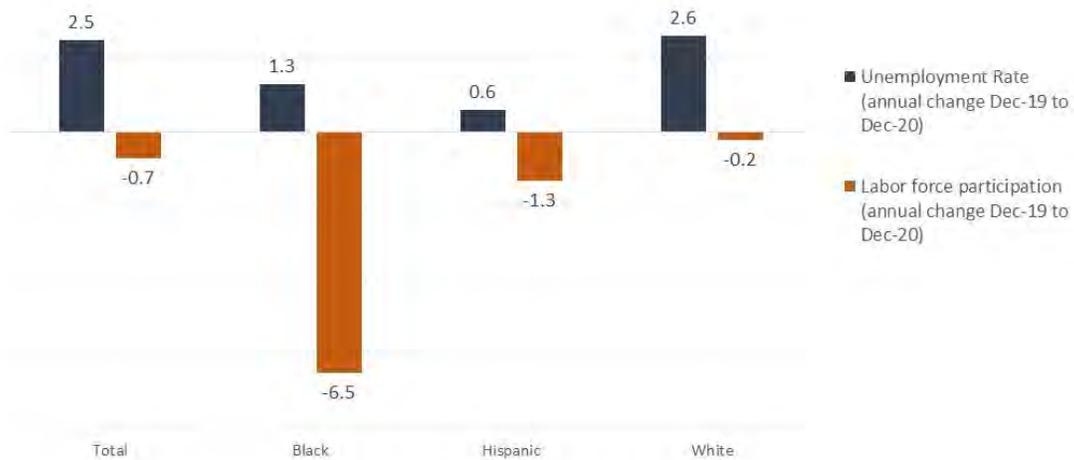
Note: This chart shows unemployment by DEED Planning Regions. Elsewhere in the report, we use the Minnesota Initiative Fund regions as our base definition.

Economic activity across Minnesota’s regions converged modestly in the second half of 2020. At the unemployment peak in May 2020, the state’s Northeast and Twin Cities regions experienced substantially higher unemployment rates than the rest of the state. But by December, unemployment levels fell with differences lessening across the state. Northeast Minnesota continued to have the highest unemployment rate at 5.8 percent but converged closer to the statewide average of 4.4 percent.

As mentioned previously, populations of color, workers with lower educational attainment, and young workers have been impacted the most, in part due to their overrepresentation in local service industries. Initial unemployment insurance claims rose over 1,500 percent and 2,400 percent for Black and Hispanic workers respectively in the spring. While differences in unemployment rate by race and ethnicity ebbed by December 2020, data from DEED suggests that this may be due largely to disparate outcomes in labor force participation.²⁶ Addressing these disparities across the state’s demographic populations will be critical both near and long term.

Exhibit 34. Falling labor force participation rates may mask extent of displacement for Black and Hispanic workers

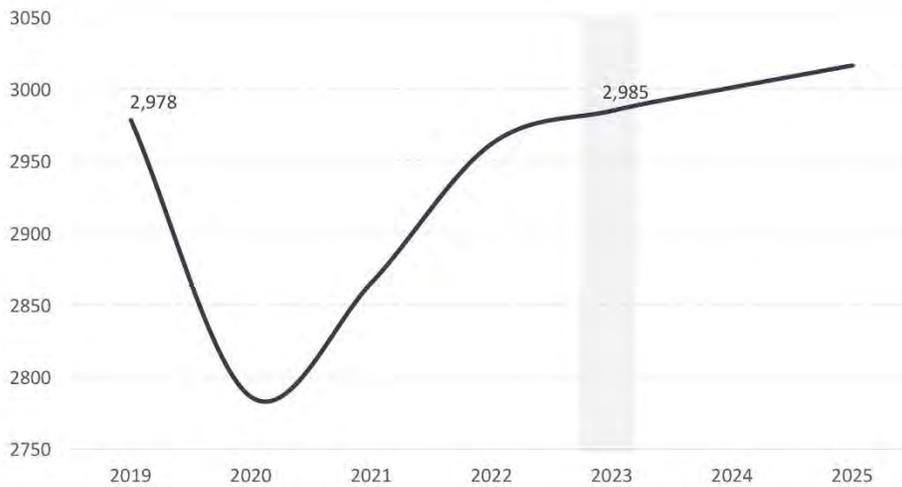
Change in unemployment rate and labor force participation rate by race: December 2019 – December 2020 (6-month moving average)



Source: Minnesota DEED, Alternative Measures of Unemployment

Exhibit 35. Minnesota employment expected to return to peak by late 2022/early 2023, though uncertainty remains

Total non-farm employment: Minnesota, 2019-2025 (projected)



Source: IHS Markit

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Short- and long-term questions raised by 2020 impacts

The impact of global pandemic leaves unanswered questions for Minnesota. As the vaccination rollout proceeds, will Minnesota's economy fully and quickly reopen? How long will it take small businesses to rebound, especially consumer facing businesses that have been faced with reduced capacity? Will businesses capitalize on new opportunities to grow even amidst challenging market conditions – and can we all come out stronger on the other end?

Longer-term questions must be addressed as well. It is too soon to tell precisely how remote work will impact local economies, but such a large-scale potential shift poses both challenges and opportunities that Minnesota should begin planning for now. Such a change could enhance prospects for businesses and labor markets by reducing geographic barriers to jobs and talent pools. The same trend could also be a major disruptor for commercial real estate markets, downtown business districts, and local workers who may increasingly compete with talent from across the globe for locally-based jobs.

Minnesota's downtown cores also face greater uncertainty. High commercial vacancy rates combined with concerns over public safety would strain the state's urban centers. In 2020, for example, Minneapolis experienced a 21 percent rise in violent crime and a 10 percent in property crimes, creating challenges for residents, businesses and employees alike.²⁷ At the same time, Minneapolis and St. Paul are economic engines for the state possessing dense clusters of talent and core economic infrastructure, such as the MSP airport. These strengths provide a foundational capacity for economic vitality in the coming years. However, leadership in both the public and private sector will be needed to carefully steward these strengths and address emerging challenges effectively.

Additionally, the pandemic could accelerate trends such as automation and digitalization. Businesses were forced to rapidly shift operations to facilitate remote work, pivot product and service offerings, improve digital capabilities, implement new health and safety measures, navigate supply chain disruptions, and maintain overall operations amidst a variety of staffing and operational challenges. Some of these changes – such as digitalization – were already well underway prior to COVID-19 and are likely to continue shaping economic activity in the future. Others dramatically accelerated potential future trends and opened new potential strategies and opportunities.

Understanding and assessing the impact of these questions and more will determine in part how quickly Minnesota's economy recovers short-term and the impact of 2020 on the state's economic growth long term.

Ten-year economic forecast

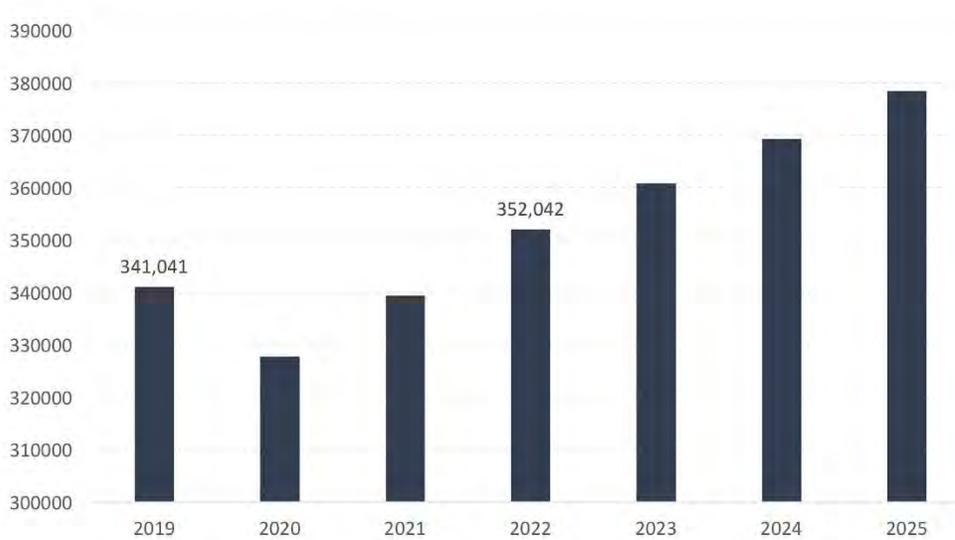
Short-term recovery

- 1. Minnesota projected to pass pre-pandemic GDP levels by 2022 and reach full employment by early 2023.** The depth of job losses experienced in March and April of 2020 combined with continued uncertainty surrounding business restrictions and vaccination efforts means Minnesota is likely to remain in recovery mode in 2021 and into 2022 or beyond. IHS Markit’s February 2021 forecast (the most recent at the time of this publication) shows Minnesota passing pre-pandemic GDP levels in 2022 and returning to peak employment in late 2022/early 2023. As they note, however: “The timing of the recovery is highly dependent upon several factors around the length and strictness of COVID-19 mitigation efforts, the spread of the virus and potential reinfections, and eventually the release of a vaccine or treatment regimen.”²⁸

The state unemployment rate is expected to continue falling as the economy recovers, reaching a low point of 3.1 percent in 2022 before rising again slightly in the following years. As of February 2021, Minnesota’s unemployment rate had ebbed to 4.3 percent, well below the U.S. rate and below previous state forecasts from the early months of the pandemic. However, falling unemployment rate has at least been partially due to declines in labor force participation, with those dropping out of the workforce not getting counted in the officially reported unemployment rate.

Exhibit 36. Gross State Product projected to pass 2019 levels by 2022

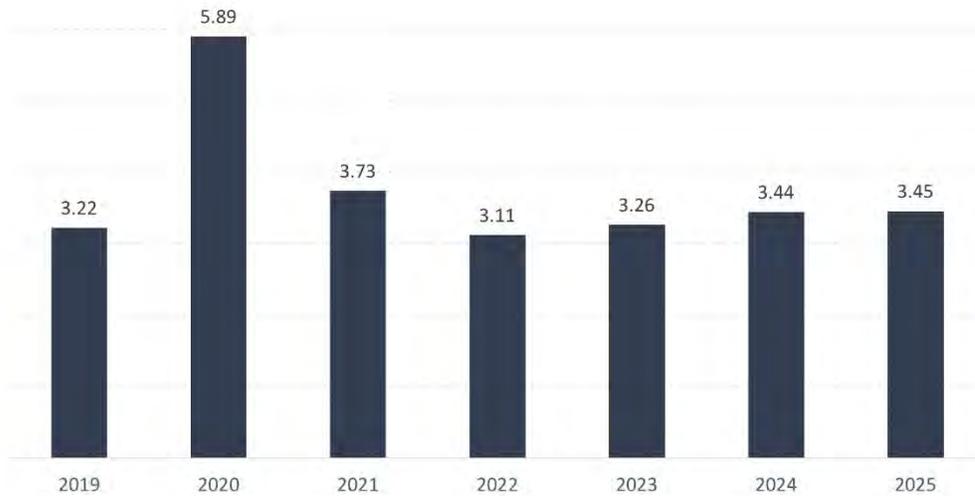
Total Real GDP (millions 2012 dollars): Minnesota, 2019-2025 (forecast)



Source: IHS Markit

Exhibit 37. Unemployment rate projected to hit low point of 3.11% in 2022 as economy recovers

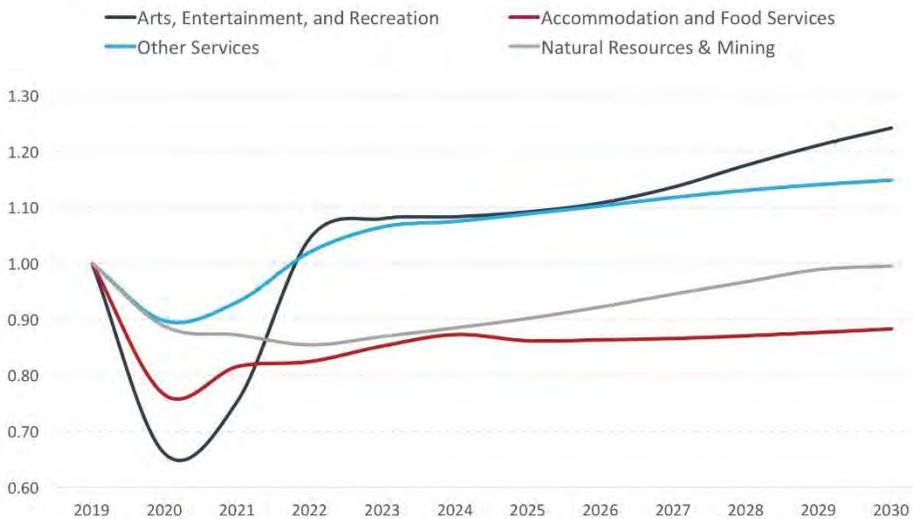
Annual unemployment rate: Minnesota, 2019-2025 (forecasted)



Source: IHS Markit

Exhibit 38. Some hard hit industries may face long-term employment losses, while others expected to bounce back faster

Total Employment by Industry Index (2019 = 1.00)



Source: IHS Markit

2. Pace of recovery is expected to differ across sectors with some hard-hit industries not returning to pre-pandemic employment levels this decade.

State level industry forecasts are subject to greater uncertainty, as public health directives and other government actions have a disproportionate impact on certain industries and are difficult to build into forecasting models. With that said, it is worth assessing the outlook for Minnesota's diverse industries as it takes steps to support short-term recovery and long-term growth.

IHS Markit state forecast data suggests that, among industries hit hardest by the pandemic, Arts/Entertainment/Recreation and Other Services are expected to bounce back fastest, while Natural Resources/Mining and Accommodations/Food Service could take a slower recovery path.

Most industries, however, are expected to return to peak employment by 2022, with six industries projected to reach pre-pandemic levels in 2021. In fact, some industries such as retail, utilities, and finance and insurance already neared or exceeded pre-COVID employment levels at the end of 2020, with several others remaining only 1-2 percent below peak.

Long-term economic forecast

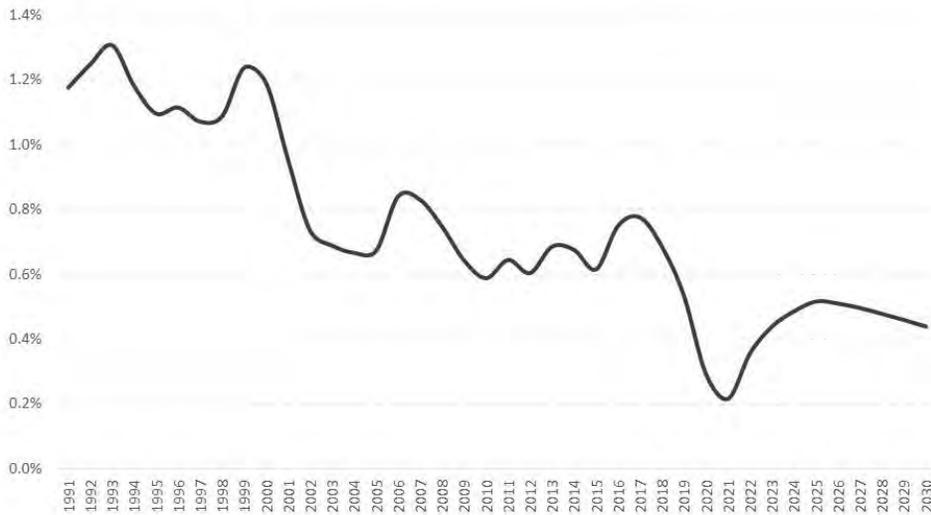
3. Slowing population and labor force growth – as well as falling labor force participation – will continue to constrain job growth this decade.

Minnesota's long-term slowdown in population and labor force growth has been a key factor in the state's overall economic performance in recent years. This theme is all but certain to continue in the coming decade, as Minnesota's core working age population (15-64 year olds) falls to a nearly flat 0.1 percent annual growth rate through 2030.

Slowing growth in the labor force is likely to intensify pressures on employers to find workers to expand operations in the state. Adding to this issue, labor force participation fell substantially in 2020 and is not expected to return to 2019 levels this decade. This double-edge sword of slowing population growth and declining workforce participation is a primary challenge to address.

Exhibit 39. Minnesota's population growth will continue slowing this decade

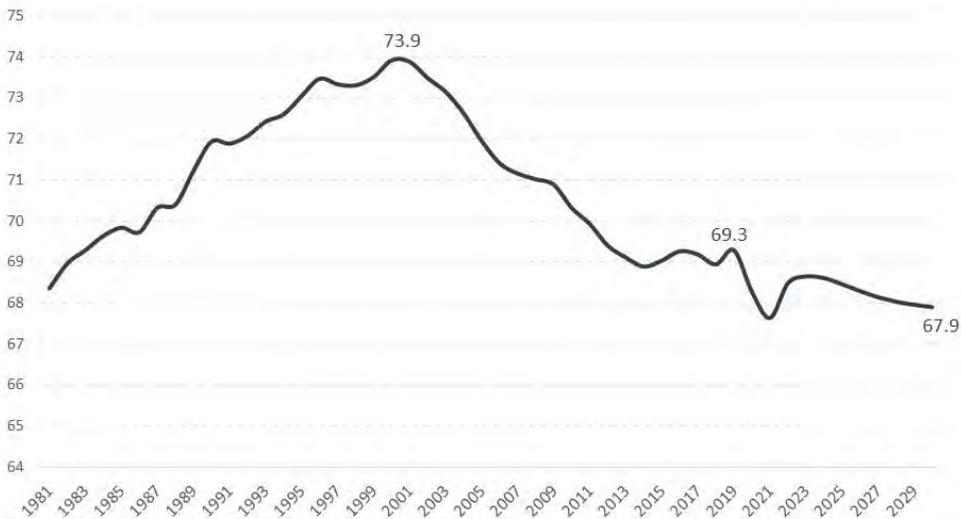
Annual percent change in total population: Minnesota, 1990-2030 (forecasted)



Source: IHS Markit

Exhibit 40. Minnesota's labor force participation is on a long-term decline, though still ranks among the highest in the nation

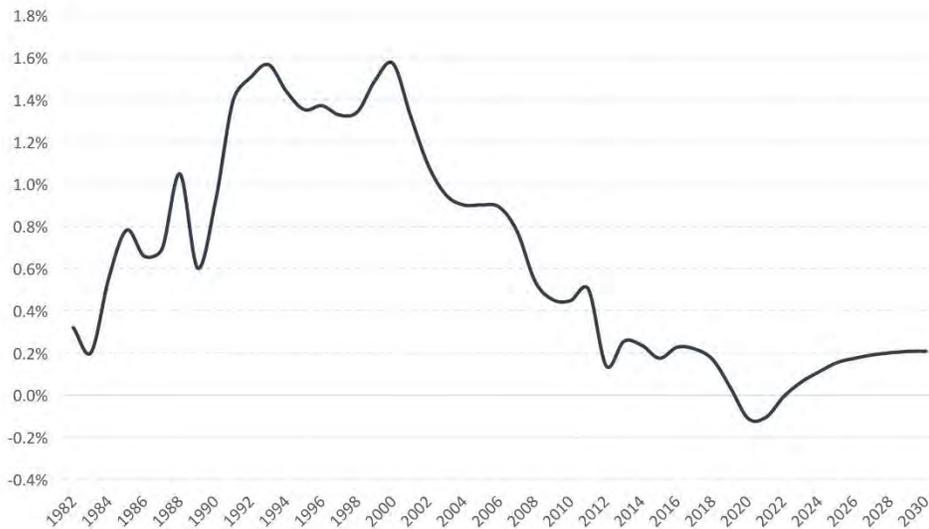
Annual labor force participation rate: Minnesota, 1980-2030 (forecasted)



Source: IHS Markit

Exhibit 41. Growth in core working age population is slowing

Annual percent change in core working age population (15-64 years old): Minnesota, 1982-2030 (forecasted)



Source: IHS Markit

4. Productivity gains will drive GDP growth, as employment grows slowly this decade.

With job growth constrained by a slowing population and falling workforce participation, Minnesota will increasingly rely on productivity gains and value-added strategies to drive growth in the state’s economy. The good news is Minnesota is well positioned to compete on such an approach. The state has strengths in highly productive sectors like manufacturing, agriculture and natural resources, wholesale trade, professional/technical/scientific services, and information technology, all of which are poised to accelerate output at a healthy rate through 2030.

As this report explores in next section, Minnesota’s manufacturing sector is expected to expand value-added output even as employment levels fall. The same is true for the state’s Information sector, which has lagged U.S. sector growth in recent years. Conversely, other industries with lower output-per-worker levels may see employment gains outpace increases in GDP.

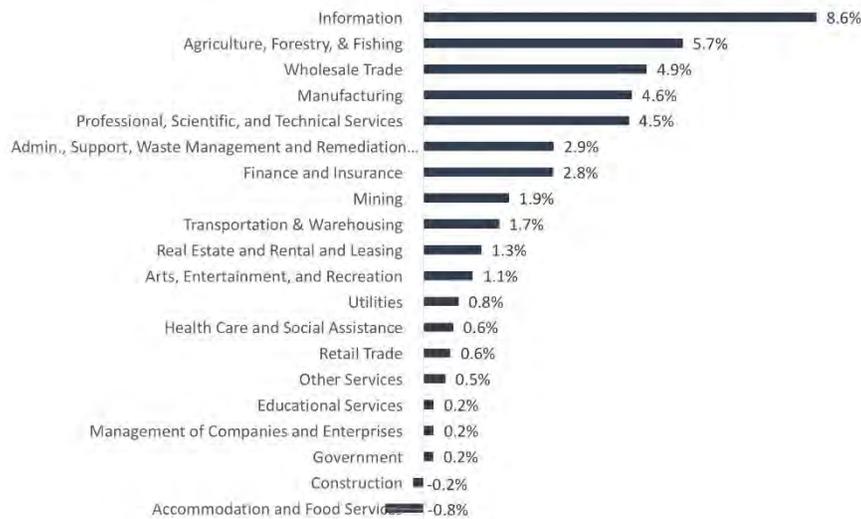
Minnesota must carefully assess what these changes mean for the state’s economic strategies going forward. Twentieth century economic policies that prioritized job creation above all else may need to be balanced with 21st century priorities and goals. It appears that innovation, development of human capital, and value-added measures will be increasingly important to advancing growth in personal income and quality of life in the state.

5. Employment shifts towards technical, medical and service industries as other major employment sectors see falling employment levels.

The ten-year economic outlook suggests that employment will continue shifting toward professional and business services, health care and social assistance, and other service activities this decade. Following long-term trends, manufacturing is expected to shed jobs even as the sector is forecasted to expand output. As seen in the following chart, Leisure and Hospitality is expected not expected to reach pre-pandemic employment levels through 2030 due to the staggering losses experienced in 2020.

Exhibit 43. Highly productive industries projected to expand output fastest this decade

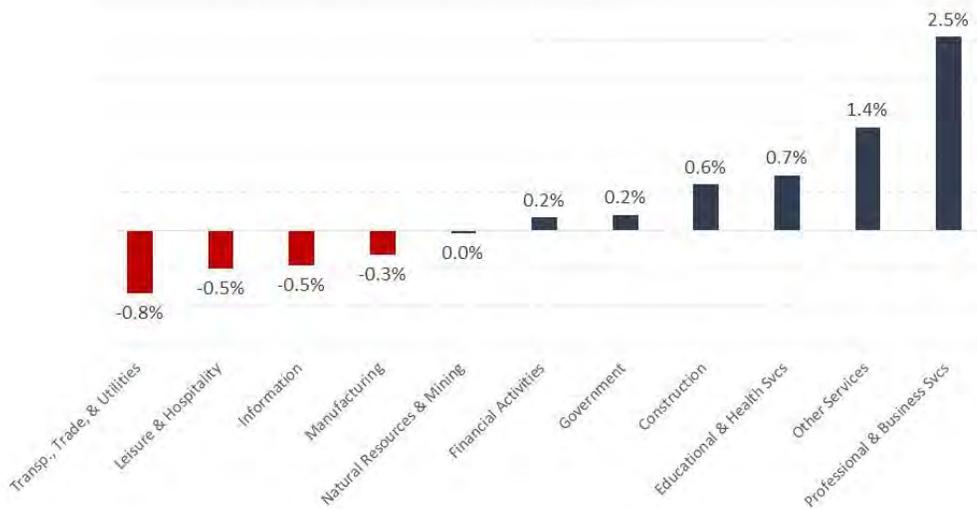
GDP by Industry (CAGR): Minnesota, 2019-2030



Source: IHS Markit

Exhibit 44. Employment projected to continue shifting toward professional/technical, medical, and service industries

Employment Forecast by Sector (CAGR): Minnesota, 2019-2030 (forecasted)



Source: IHS Markit

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Forecasts at detailed industry levels are subject to greater uncertainty given the unusual dynamics surrounding the COVID-19 pandemic. However, it is worth noting that IHS Markit's long-term forecast shows divergent trends among industries even within the same super-sectors. For example, in their February 2021 forecast, IHS projects that Arts, Entertainment and Recreation will bounce back from 2020 losses and grow at an annual rate of 2 percent through 2030. Whereas its Leisure and Hospitality counterpart – Accommodations and Food Service – is expected to remain below pre-pandemic employment levels throughout the decade.

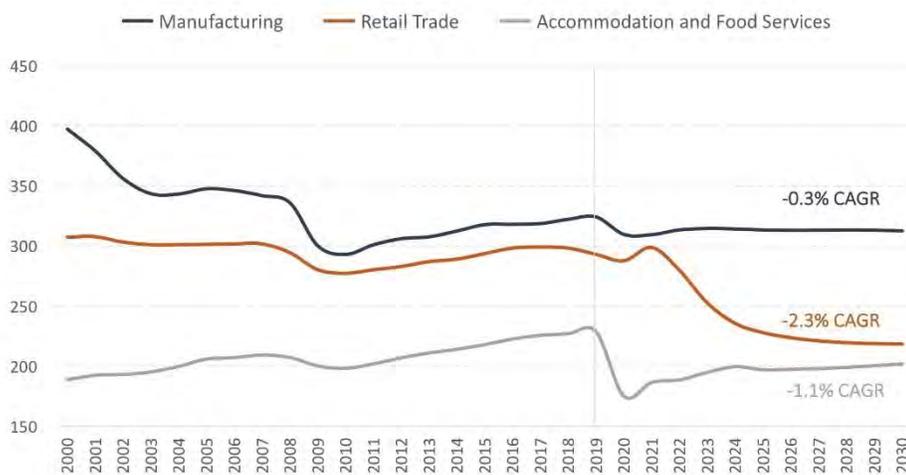
These projections should be viewed cautiously but do signal trends to watch.

It is also important to note directional trends in some of Minnesota's largest sectors. For example, Minnesota's manufacturing, retail, and accommodations/food service industries employed a combined 845,000+ Minnesotans in 2019, but by 2030 could employ 112,000 fewer workers. The factors driving projected job losses differ. Declining manufacturing employment is primarily driven by automation and productivity gains, as the sector is forecasted to expand GDP at a fast rate over the decade. Retail may also shed jobs due to automation and market shifts such as e-commerce, though GDP is projected to grow at a slower rate of 0.6 percent per year. Accommodations and food service projections may be more related to industry impacts from the COVID-19 pandemic, as employment levels plummeted in 2020 and are projected to only slowly recover in subsequent years.

On the other hand, industries such professional, technical, and scientific services or health care and social assistance are poised to continue adding jobs over the decade, fueling demand in health care and technical occupations. Minnesota should consider what these outcomes would mean for the state's future workforce and begin developing strategies to capitalize on opportunities while mitigating negative impacts caused by the shifts in employment demand.

Exhibit 45. Major sectors with projected employment losses this decade

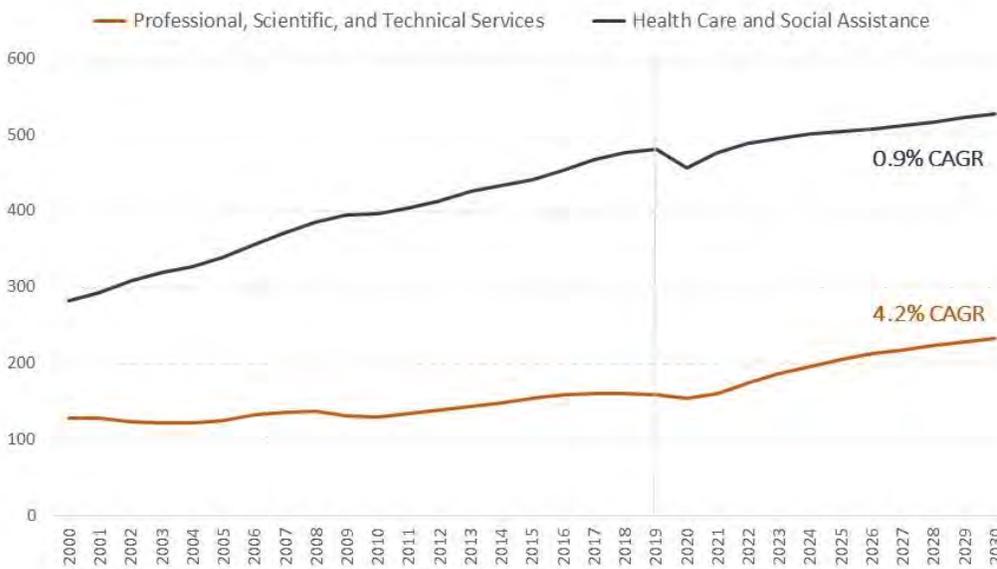
Total employment (thousands) by industry: Minnesota, 2000-2030 (forecasted)



Source: IHS Markit

Exhibit 46. Major sectors with projected employment gains this decade

Total employment (thousands) by industry: Minnesota, 2000-2030 (forecasted)



Source: IHS Markit

Exhibit 47. Demand for health care and technical talent will grow

Top ten occupations with highest projected 10-year growth rate: (Median wage > \$57,000)

Job Title	Projected 10-year Growth Rate	Projected 10-year Openings
Statisticians	32.70%	1,076
Actuaries	30.20%	544
Physician Assistants	28.40%	1,882
Information Security Analysts	27.70%	2,983
Marriage and Family Therapists	27%	1,537
Speech-Language Pathologists	24%	2,732
Operations Research Analysts	23.80%	3,172
Nurse Practitioners	22.80%	3,254
Computer Numerically Controlled Tool Programmers	22.60%	968
Software Developers and Software Quality Assurance Analysts and Testers	21.80%	20,578

Source: Minnesota DEED, Occupations in Demand

Minnesota's Competitiveness

Minnesota's competitiveness nationally and globally also helps fuel – or constrain – our economy.

Each year, the Minnesota Chamber of Commerce analyzes and reports on Minnesota's economic competitiveness in its annual Business Benchmarks report.²⁹ In the context of this report, it is important to note that Minnesota's competitive position and competitive landscape influences the state's economic potential.

Education

The skills and talents of Minnesotans are the most important factor in Minnesota's competitiveness. We have above-average education levels, we are a leader in workforce participation, and many employers argue that our work ethic is strong, even very strong. Minnesota's education system performs well on some measures. One study ranked Minnesota 6th in the nation for its public schools in 2019. With 46.8 percent of Minnesota adults having earned least an associate's degree, Minnesota also ranks 4th nationally for educational attainment – and our labor force participation rate ranks 3rd.

Educational success is not always broadly shared across communities, however, and on key measures Minnesota lags. Our 4th grade reading scores ranked 12th in 2019, but our 8th grade reading scores ranked 20th, eight spots lower than 2018.

Minnesota's on-time high school graduation rate ranked 34th nationally in 2018, at 83 percent. In what must be surprising to most Minnesotans that is below the national average of 85 percent.

Minnesota's racial educational achievement gap is also arguably the nation's worst. Nationally, the high school graduation gap between white and black students is 11 percent — 89 percent for white students and 78 percent for black students. In Minnesota, the gap is 23 percent. Few things have been more discussed in Minnesota – with less progress being made.

Taxes and cost of living

Minnesota's tax climate is decidedly less competitive than peer states nationally.

High-tax advocates argue Minnesota's quality of life is the result of high taxes. But there can be little doubt that Minnesota's tax climate also impacts business investment and job growth.

For small businesses and entrepreneurs, Minnesota's tax index is 4th highest in the nation, the same as 2017. Minnesota's pass-through and individual income top tax rates rank 5th highest in the nation at 9.85 percent. Minnesota's corporate income tax rate ranks 4th highest in the nation at 9.8 percent.

The state's cost of living ranked 23rd nationally in 2018, slightly below the national average.

Regulatory climate is an important factor difficult to measure, but Minnesota is believed to be roughly middle of the pack. Environmental permitting and the regulatory burden on home building are areas for improvement. Overall, Minnesota's state and local taxes per capita rank 9th highest in the nation – at \$6,176 – well above the national average of \$5,073.

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Economic growth / Job growth / Innovation

State GDP growth, at 1.1 percent, ranked only 36th in the nation in 2019, fourteen spots worse than Minnesota's ranking in 2018. Annual exports ranked 26th, thirteen spots lower than in 2018.

Annual job growth ranked 35th nationally in 2020. Jobs actually contracted 6.8 percent, largely due to COVID-19. That was worse than the national average of negative 6.4 percent, but ten spots better than Minnesota's dismal job growth showing in 2019, when the state ranked 45th.

Minnesota's unemployment rate ranked 14th nationally in 2020, at 6 percent, below the national rate of 7.9 percent and seven spots better than 2019.

Personal income per capita ranked 14th nationally in 2019, the same as 2018. Output per working adult ranked 13th, two spots better than 2018.

Minnesota ranked 49th in entrepreneurship and business startup activity in 2019, two spots worse than 2018 at almost the worst overall rating in the nation. Our five-year business survival rate is among the best, however, at 4th overall and on patents per capita Minnesota ranks 6th overall.

Reputation

Competitiveness goes beyond taxes, GDP growth and educational outcomes – and beyond ratings and rankings. Minnesota's reputation is not currently measured. Now more than ever that is a concern.

The death of George Floyd and the social justice outcry that followed has been a reputational blow to Minneapolis, the Twin Cities and Minnesota. Deteriorating public safety and political arguments about defunding police only add to these concerns. Rising office vacancies combined with a COVID-19-fueled flight to larger suburban and exurban homes is a concerning trend for center cities – and for a Twin Cities metro still unquestionably critical to the overall economic engine of Minnesota.

Minnesota's challenges are high-profile and nationally under the spotlight. We will build or undercut our reputation as we go – and the stakes are unbelievably high. Because reputation matters. Our competitiveness sets the boundaries for our future economy.

Megatrends: Global forces will also shape Minnesota's economy this decade

Global megatrends will also shape the role of governments and the economy to 2030 and beyond.^{30,31,32,33,34} As we recommend strategies to spur Minnesota's economic growth in the next decade, it is important to also consider the impact of global trends on the state's economy.

Megatrends are large-scale social, economic, political, environmental or technological shifts driving change in global markets and impacting how people live and work.

Unfolding over extended periods, global megatrends influence human and economic activities for decades. States, regions, in many cases the entire world, are affected. Because they affect so many over a long period – and not easily changed – megatrends are strategic forces shaping the future economic landscape.

Demographics:

There will be about 1 billion more of us by 2030, and we'll be living longer. The world's population should reach 8.5 billion people by 2030, up from 7.3 billion in 2015.³⁵ Most will be middle class, as the percentage of global citizens in dire poverty continues to drop.³⁶ Even as the middle swells, the percentage of new wealth accruing to the very top of the pyramid will continue to be a major and potentially destabilizing issue. Higher life expectancies and falling birth rates will make the elderly the fastest growing demographic, with the population over 65 exceeding 1 billion by 2030.²⁷ Life expectancy at birth will increase almost eight years by 2050.³⁸ In America, the 65 and over population will nearly double by 2050, from 48 million to 88 million,³⁹ further reshaping demand, the economy, and challenging the solvency of social welfare systems, including pensions and health care. Megatrends such as climate change, or global pandemic, could slow these outcomes. But the trend here is clear – demographics is destiny.

Economic power shifts:

Economic power will continue to shift. Emerging economies will exert more influence in the 2030 global economy, with emerging nations lifting millions out of poverty. As global economic power rebalances, the focus of international institutions and national governments on interconnectedness and positive reciprocal relationships will only increase. India will surpass China as the world's most populous nation by 2027.⁴⁰ Asia's population will grow to over 5 billion by 2050.⁴¹ Europe as a percentage of the global economy will decline. America will as well.⁴² With the fastest-growing middle class, Africa by 2030 will add nearly half a billion people.⁴³ Emerging economies like Mexico and Indonesia by 2030 will be larger than the UK or France (in PPP), while Turkey could surpass Italy.⁴⁴ Some regions will face the challenge of integrating large youth populations into saturated labor markets. Countries may face significant fiscal and policy constraints due to heavy public debt levels through 2030 and beyond. The ability to bring debt under control and find new ways of delivering public services will affect governments' capacity to respond to major social, economic and environmental challenges. But the shift in economic power from west to the east and from developed markets to emerging will continue.

Urbanization:

Two-thirds of us will live in cities – and cities will continue to grow. By 2030, two-thirds of the world's population will live in cities, producing as much as 80 percent of global GDP.⁴⁵ Urban populations will double, and the land area covered by cities could triple. Large cities and mega-million cities remain at the leading edge, but the fastest growing are small and medium cities of less than one million, accounting for 59 percent of the world's urban population.⁴⁶ China alone expects to have 200 cities with a population of over one million people by 2025. Rising cost of living, energy and transportation needs, food distribution and housing will be countervailing forces creating both risks and opportunities, such as the need for better building management technologies. The state will also need more and better distribution systems to move food from where it's grown to where it's eaten — or to rapidly expand urban agriculture. Impacts of COVID-19 could slow growth in developed markets near-term, but urbanization almost certainly continues.

Exhibit 48. Global Megatrends shape economic outcomes

- 1** **Demographics: There will be 1 billion more of us by 2030.** The world's population should reach 8.5 billion people by 2030, up from 7.3 billion in 2015.
- 2** **Economic power: Shifting from west to east.** Emerging economies will exert more influence as economic power rebalances.
- 3** **Urbanization: Two-thirds of us will live in cities.** Two-thirds of the world's population will live in cities by 2030, producing as much as 80 percent of global GDP.
- 4** **The Individual: More empowered, more information, less privacy.** Advances in education, health and technology will empower individuals as never before.
- 5** **Climate Change: The Earth continues to warm.** The climate is changing. Globally, 2020 was the warmest year ever (tying 2016) and the decade just completed was the warmest in modern times.
- 6** **Resource Pressures: The world will confront constraints.** Resource constraints and competition for resources will be intense next decade, especially for food, productive soil and arable farmland.

Rise of the individual/transparency:

Individuals will be more empowered, with greater access to information but less privacy. Advances in global education, health and technology are empowering individuals like never before, leading to increased demands for transparency and participation in institutional and public decision-making. These changes will continue, ushering in a new era in human history in which, by mid-decade, more people will be middle class than poor.

Empowered by the digital revolution, Big Data and the ability to track everything will continue toward a radically more transparent world for good and bad. The amount of information collected on every person, product, and organization will continue to grow exponentially, but the pressure to use or share that information — on customers and consumers in particular — will expand. Tools to analyze information will continue to grow in sophistication, influencing decision-making. It will become easier to choose products with the lowest carbon footprint, to identify the highest wages for

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employees, or avoid particular ingredients. But data tools will also impact privacy in the process with mixed implications for consumer and economic relationships.

Climate change:

The climate will continue to change as the Earth continues to warm. There is uncertainty about exactly how climate change will play out, but not about the direction. The climate is changing. Last year was the fifth warmest on record in the U.S., with each of the top five coming since 2012.⁴⁷ Globally, 2020 was the warmest ever, effectively tying 2016, with the decade ending in 2020 b the warmest in modern times.⁴⁸ Since 1880, when reliable climate record-keeping began, the annual global temperature has risen an average of 0.14 degrees Fahrenheit per decade. Since 1981, the average rate of increase has been more than twice as high.⁴⁹

The impacts have been discussed and debated, but climate scientists project significant shifts. Highly-populated coastal areas would see sea levels rise. Species and coral ecosystems would be stressed, island populations at risk, and the Arctic ice-free in summer. Droughts and floods in breadbasket regions could require shifts in where major crops are grown, and between seas, heat and shifts in water availability, mass migrations will likely have begun. Geopolitical conflicts could follow.

Dangerously dry conditions and warm waters fueled a record number of catastrophic wildfires, hurricanes and other disasters in 2020, fueling 22 extreme weather events inflicting at least \$1 billion in damage in the U.S., the most in a single year, for a combined \$95 billion in losses. A derecho in the Midwest, record-smashing Western wildfires and 30 tropical storms in the Atlantic, breaking the record of 28, were all included.⁵⁰

The world will have more clarity on climate change by 2030, but atmospheric and economic inertia makes change inevitable. Efforts to radically alter carbon emissions seem unlikely to succeed. The Paris Climate Accord of 2015 sought to hold warming to 2 degrees Celsius, but commitments so far likely only hold the world to no more than 3 degrees of warming.⁵¹ Scientists project the climate is likely to already be approaching the 1.5 degree warming mark by 2030.⁵² The economic implications of climate change are immense. Everything from agriculture to energy to manufacturing will be touched. The private sector may lead the way on the response, both reactively out of necessity, opportunistically where possible, and from a social responsibility perspective. By any measure, climate change is the ultimate global megatrend.

Resource pressures:

The world will be forced to confront resource constraints. To keep volumes of major commodities, such as metals or paper products, in line with economic growth, the global population will need to embrace more circular models, such as sourcing less virgin material, using recycled content and remanufacturing products. Water will be a particularly stressed resource, and it seems likely future cities may be constantly in a state of water shortage.⁵³ We will need more investment in water technology and desalination. Resource constraints and competition for other resources will be intense, especially around food, productive soil and arable farmland. Access to and availability of a wide-range of necessary economic inputs will be a pressure point around the world – with water potentially the most treasured resource of all.

Clean power/clean tech:

Transformation of power grids, roadways and buildings will accelerate. Innovation and the falling cost of clean technologies is reshaping key aspects of our lives and economy at an accelerating pace. Renewable energy is dramatically on the rise, making up more than half the new global power capacity added each year since 2015.⁵⁴ By 2030, some project that effectively no new additions of generating capacity will come from fossil-fuel-based technologies.⁵⁵ Electric vehicles (EV) will be dominating the transportation equation. While estimates of the 2030 share of EVs on the road range from the teens to nearly 100 percent, sales of new vehicles will have shifted toward EVs.

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Dramatic reductions in the cost of batteries and legislation/regulation likely phasing out fossil-fuel engines will be a driver. We will see an explosion of data-driven technologies making buildings, the grid, roadways and water systems substantially more efficient. The clean tech transformation links to the megatrends of climate change and resource pressure, moving hand in hand.

Technology:

The Internet of Things will have won the day. Information and communications technology has transformed society, with a wave of new advances creating novel opportunities while testing society's ability to harness their benefits. By 2030, connection of virtually every new device will be the norm. Proponents of "singularity" project dramatic leaps forward in affordable artificial intelligence (AI). Machine learning and AI will go beyond choosing driving routes and optimizing traffic to helping plan much of our lives and make us more efficient. Technology may empower but will also intrude on our lives and economy even more than it does today. AI will create new kinds of jobs, but may eliminate near entire segments of work, from truck and taxi drivers to paralegals and data analysts.

Interconnectedness:

There is an open question about how nations and economies will interact. The global economy will see continued increases in international trade and capital flows, but nationalism and populism are on the rise. Even less certain than policy prescriptions or hope for global cooperation is the support, or lack thereof, among growing numbers of people for different philosophies of governing. Populists have been elected or consolidated power in countries as varied as the U.S., Brazil, India, and Hungary, even as citizens in Algeria and Sudan seem to push back. The trend toward populism inside nationalism may be the greater concern. The world history of such movements is concerning and would only be more so in a resource-pressured world. Unless international conventions can be strengthened, progress and economic benefits may not be realized. Cooperation and respectful discourse continue to deteriorate. If markets remain the more powerful force, governments and institutions may work together to fight climate change, address resource pressures, tackle inequality and address poverty. If nationalism becomes the more assertive trend, interconnectedness could decline with significant implications for trade, production, and supply chains. Tariff wars and Brexit are just two examples. Predicting politics is nearly impossible, so it is hard to say how global issues will be addressed. Will trade and tariff wars grow, or will interconnectedness carry the day? Even more than today, it appears business will play the major role in driving sustainability – a significant trend in itself.

Megatrends present both challenge and opportunity.

The megatrends are interrelated, differing across the world but globally interconnected and reinforcing in terms of impact. Changing demographics, resource stresses and climate change are examples. Many of the world's natural resources, including water, energy and food, are already under stress. With an increasing population and a growing middle class, a 50 percent jump in food production will likely be necessary to meet demand, requiring additional water and energy consumption. Competition for key inputs, including arable land, is an issue. Export bans and trade barriers are another. The potentially devastating effects of drought or extreme weather would only exacerbate these pressures. As the number of drought-displaced people increases, climate change would impact urbanization, which would itself accelerate the resource stresses on power consumption and food distribution.

Though directional, the outcome, breadth and pace of individual change is inherently uncertain.

As a strategic framework, however, global megatrends have the potential to shape and reshape our lives, providing valuable context in our considering our economic future.

Part two: Minnesota: 2030 Framework for growth

Not all future changes in technologies, markets and individual business decisions can be predicted with precision or built into standard forecasting models. Events like the COVID-19 pandemic are a case in point.

Some trends can be forecasted with a fair degree of confidence however, giving a better sense of how the economy is likely to change in coming years and enabling thoughtful actions to steward our future benefitting all Minnesotans.

Here are some safe bets we can likely make about the next decade:

- Minnesota's population will continue to age demographically, and our labor force will continue to grow only slowly, exacerbating already-significant workforce challenges. The availability of talent will only increase as a key driver or limiter of our economic competitiveness.
- New technologies will continue to transform industries and shift the skillsets demanded in the workforce.
- Health care and technology advancements will play increasingly large roles in our economy. Likewise, global demand for health and wellness goods and services will continue to increase in the face of aging populations in developed countries and rising living standards in emerging markets.
- Resilient economies able to adapt to change will be better equipped to absorb the shocks of unexpected events and shifting market forces.
- A growing economy will require strong communities with the underlying assets needed to serve residents and help businesses expand.
- Minnesota's population will be more diverse, with communities of color making up a larger share of our workforce, consumer base, and business community.

Global megatrends, such as water and resource constraints, climate change and rising global food demand, will also influence Minnesota's economy and economic opportunities in the coming decade.

An objective of Minnesota: 2030 is to establish a strategic framework that acknowledges and prepares for such changes, helping Minnesota develop and grow to its full potential.

This report suggests three fundamental Minnesota: 2030 strategies for ensuring an even brighter economic future for Minnesota and Minnesotans – with specific priorities and recommendations under each:

- **Build on strengths**
 - **Leverage Minnesotans**
 - **Strengthen communities**
- **Build on strengths** acknowledges Minnesota's diverse strengths across a range of industries, including corporate headquarters, food and agriculture, manufacturing, health care and med-tech, to name a few. Appropriately for any strategic plan, we suggest building on the strengths that Minnesota has – continuing to reinforce those economic sectors while also diversifying by further investing in high-growth areas like health care and technology that will allow Minnesota to accelerate economy activity while remaining resilient.

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- **Leverage Minnesotans** addresses the key asset that enables economic growth and the foundational imperative to grow the workforce while helping individuals develop the skills they need to succeed in a 21st century economy. This will require Minnesota to better train, retain and attract talent, to further build workforce participation by ensuring no one is left on the economic sidelines, and rethinking how public and private sector stakeholders work together to respond to evolving skill, training and educational needs.
- **Strengthen communities** lays out two critical priorities to better position our economy for growth. The first is to deliver necessary housing, child care and digital connectivity. These are foundational to community vitality and growth, with each area facing supply side challenges that must be addressed. The second priority is to Embrace All Minnesotans and Make Inclusion a Strength. Minnesota is strengthened by its diverse populations, but unacceptable disparities pose both a moral and economic imperative. Minnesota has advantages – not least its private sector businesses – that can turn diversity and inclusion into a strength making Minnesota a leader in innovative practices that help boost our economy by helping all Minnesotans flourish.

These three core Minnesota: 2030 strategies rose repeatedly to the surface as we assessed strengths, analyzed Minnesota's economic performance, projected Minnesota's future growth and conferred with key stakeholders. Within each strategic priority, we put forward a series of specific recommendations and action plans.

Minnesota: 2030 is a framework for discussing and embracing what Minnesotans can do together to sustain and grow our economy to its fullest potential this decade.

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Build on strengths

Minnesota has a diverse and resilient economy with industry strengths and natural resource advantages that can be built upon this decade.

Let's look at Minnesota's economic diversity and resilience. As noted, IHS Markit's analysis showed Minnesota had the 5th most diverse state economy in 2018, as measured by the distribution of employment across industries.

Minnesota's economy has also become increasingly diverse over time. While not necessarily leading to faster economic growth, the relative distribution of employment across industries may help moderate economic swings, preventing Minnesota's economy from diving as deeply in downturns and helping it recover more quickly after national recessions.

Minnesota achieved the 15th fastest recovery from the Great Recession among the states, reaching full recovery after 23 quarters. This resiliency aided Minnesota in 2020 as well, when the state's unemployment rate rose less severely than the U.S., and well below the hardest hit states, such as Nevada, Michigan and Hawaii.

In addition to a diverse industry mix, Minnesota businesses seem to exhibit a high level of adaptability and longevity. For example, despite ranking near the bottom (49th in 2019) for entrepreneurship rates, Minnesota had the highest five-year business survival rate in the nation in 2019, and consistently ranks in the top five states in this measure.⁵⁶

Resiliency seems to be a factor for more mature businesses as well. Many of Minnesota's Fortune 500 companies – representing a diverse range of industries – were founded 100 years ago or more, adapting to a changing economy over time. Given the churn among top companies this is notable. In fact, of the original companies named on the first Fortune 500 list in 1955, only 52 remain on that list today – and three are headquartered in Minnesota: 3M, General Mills, and Hormel.⁵⁷ Several others, such as Honeywell, have deep Minnesota ties. In contrast to some Midwest regions that lost anywhere from 28-72 percent⁵⁸ of their Fortune 500 headquarters since 1955, Minnesota saw net gains, further establishing itself as a corporate headquarters hub.

Despite not being overly dependent on any one sector, Minnesota possesses distinct industry strengths and natural resource advantages. The state has high industry concentrations in sectors like manufacturing, food and agriculture, management of companies, finance and insurance, and health care. It has regional clusters such as metal ore mining, forestry products, tourism and recreation, and a variety of specialized manufacturing sub-sectors. Some of these industry strengths are accidents of history, but others reflect the state's natural endowments – features or resources that can't be easily replicated elsewhere. A number of industries also possess synergies with one another that are and can be leveraged for future economic development.

Take, for instance, the state's food and agriculture sector. Like its Midwestern neighbors, Minnesota is a major food producer. In fact, Minnesota was the 5th largest agricultural producer in the U.S. in 2019, trailing only California, Iowa, Nebraska, and Texas.⁵⁹ What sets Minnesota apart is that it is also home to leading global food and agricultural headquarters companies driving food innovation and management, as well as specialized manufacturing and service industries producing new technologies and critical inputs for the food and ag sector. It is clear that Minnesota has considerable opportunity to continue to leverage these strengths driving food and agriculture innovation across the value chain this decade.

Or consider the role that water plays in Minnesota's economy. The state's lakes and rivers are a point of pride noted in our Land of 10,000 Lakes slogan. What is less recognized is the cluster of leading firms currently producing water related technologies and innovation in Minnesota. Companies such as Ecolab, Pentair, Donaldson, Toro, 3M, SJE-Rhombus, Uponor and many others are producing and advancing technologies to treat, test, filter and apply water in markets around the world.

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Not only is water innovation and water technology an opportunity in its own right, but these innovation assets could also be further leveraged to solve water-related challenges in other Minnesota industries such as mining and agriculture. Could Northeastern Minnesota become a global laboratory for mining and water solutions, for example? The critical assets are already in place to pursue such strategies.

One last example. Consider Minnesota's unique combination of building products and building services industries. The state has strengths in a range of diverse building-related activities, including raw inputs (e.g., forestry products), global door and window companies, leading glass manufacturers, high shares of HVAC equipment and furniture manufacturing, building controls and automation technologies, and a fast-growing architecture, engineering, and construction sector. As environmental concerns drive growing demand for sustainable building solutions, Minnesota could creatively connect and activate core strengths in these sectors to capture new opportunities.

Building on strengths includes:

- **Protecting Minnesota's key strengths as a priority.** Regional and state economies are always at-risk of taking for granted hard-earned strengths they have developed over time. Whether this is related to natural resources, leading companies, or industry clusters, Minnesota should take care to steward its valuable assets. This includes ensuring a competitive business climate that encourages private sector investment, responsible natural resource management practices that deliver predictability and science-based decision making, and business retention strategies that proactively identify companies' needs to enable their expansion and growth in the state.
- **Help industries adapt and capture new opportunities.** This is an area where Minnesota can leverage its unique mix of strengths. Research institutions like the University of Minnesota play a large role, as do economic development entities, chambers of commerce, industry associations, entrepreneurship and startup organizations, and private businesses themselves. The paradigmatic success story is Minnesota's taconite industry, born out of University of Minnesota research in the 1940s and 1950s. That University of Minnesota-led research demonstrated a new way to process low grade taconite for steel production to develop and rejuvenate Minnesota's mining industry. Tech transfer through the University of Minnesota has actually accelerated in recent years, helping launch more than 165 new companies since 2006. Such activities are just one of many ways to continue to build on Minnesota strengths and capture new opportunities this decade.

We explore key Minnesota economic strengths and outline strategic frameworks to leverage and build on those strengths below:

Grow Minnesota's corporate and financial sector

Minnesota has an opportunity to leverage its significant advantages in corporate headquarters, professional services and financial activities this decade. The state's leading companies continue to perform well, and a pipeline of fast-growing companies show encouraging signs for the future. The state's professional, scientific and technical services sector has also grown at a healthy rate in recent years and is projected to continue expanding faster than the overall state economy this decade.

Across all three industries, talent will be the key factor in shaping success, as job growth continues to shift toward higher-skill positions.

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The state faces challenges and risks that must be addressed in coming years as well. Employment projections signal slowing job growth for corporate headquarters and the finance and insurance sector in the decade. This may be further exacerbated by Minnesota's slowing labor force growth that has struggled to supply sufficient numbers of workers in high-demand occupations. Despite some notable successes, entrepreneurship has also lagged in Minnesota in recent years with gaps continuing to exist for entrepreneurs of color. Finally, changes in remote work present opportunities and risks that must be addressed as the state prepares for its post-pandemic future.

This combination of opportunities and challenges requires a strategic response from Minnesota's public and private sectors:

- **Prioritize diversity and tech talent to ensure a dynamic corporate sector future.** This is not a new issue, but it remains the elephant in the room for Minnesota's business community. This is particularly true for global companies looking across the U.S. and beyond for where best to invest in jobs and offices. *See Leverage Minnesotans.* Business leaders in our discussions made very clear that diversity and talent are only increasing in importance - and that both will be critical factors in determining whether Minnesota remains a corporate headquarters location long term.

A number of initiatives are already underway to address the dual imperative of diversity and talent, such as Greater MSP's Make.It.MSP. Building on these types of initiatives across the state will be critical this decade.

- **Leverage affordability and address business climate concerns.** Affordability cuts two ways. Minnesota offers a lower cost of living than many peer states, particularly compared to the nation's "superstar cities" challenged by soaring housing costs, congestion and gentrification. At the same time, Minnesota's business climate is less competitive than many fast-growing regions in the sunbelt and mountain west.

Minnesota cannot continue to be successful as a hub for leading companies if it remains both a low population growth *and* high business cost state. Leveraging the state's relative affordability, while improving its business climate could be a critical success factor over the decade.

- **Develop focused efforts to retain investment and capture greater shares of the job and business expansion of existing leaders and rising stars.** Business location decisions make headlines. But a far greater number of jobs is won or lost each year in the decisions Minnesota companies make about where or whether to expand and grow nationally and internationally. We've heard directly from headquartered companies that acknowledge not choosing Minnesota as a place to add new jobs or invest capital. In some cases, diversification or market development drove those decisions. In other cases, it was access to talent or the ability to source employees from other, deeper talent pools. Some businesses choose to keep management functions in Minnesota, while growing production or operations in states with larger talent pools or more favorable business climates.

Capturing a greater share of investment from current Minnesota companies – whether existing sector leaders or fast-growing new startups – should be a top priority for Minnesota. Coordinated efforts to retain a greater portion of the jobs and/or capital investments Minnesota companies may make elsewhere could be a major economic growth strategy for the state. Programs like "Grow Minnesota!" from the Minnesota Chamber of Commerce play a critical role in helping Minnesota's top employers and fastest growing companies connect to resources and overcome barriers that might otherwise prompt an investment of capital or the growth of jobs elsewhere, encouraging those companies to grow in Minnesota.

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- **Build on startup activities to seed the ground for the next homegrown star.** A number of startup funding and support initiatives have emerged in recent years. These investments are critical to Minnesota's ability to continually build its pipeline of high growth-potential companies. Medtronic was once a startup. United Healthcare was once a startup. Even 3M and Mayo Clinic were once startups. Minnesota's newest company with a compelling new idea could be the Medtronic or UnitedHealthcare of the future. What do they need? What resources and support mechanisms would be helpful? How can we facilitate and support their future growth and success? States that successfully support entrepreneurs and startups are investing in their own economic future. Minnesota should strive to be best in class in nurturing and supporting its next generation of rising economic stars.
- **Explore remote work as a way to grow corporate/financial employment outside the Twin Cities metro.** Minnesota's corporate and financial activities are largely clustered in the Twin Cities metro region, but many companies in this sector have facilities in greater Minnesota. Delta Airlines' Customer Service Center in Hibbing and Toro's manufacturing plant in Windom are examples. In the reverse, Hormel and Marvin have primary locations on opposite ends of the state, with support facilities in the Twin Cities. While the full future of remote work is uncertain, Greater Minnesota communities should be aggressively seeking to leverage remote work opportunities as a trend to their benefit. This could occur in two ways.

First, regions and communities could work with existing headquarters or financial companies to help identify and expand hiring pools in specific regions. Doing so could enable companies to find the workers they need to grow in Greater Minnesota.

A second opportunity involves promoting Greater Minnesota's quality workforce and quality of life – and their lower cost – to recruit corporate professionals now able to work remotely who may prefer Greater Minnesota's lifestyle and livability advantages. This could grow the local economy of smaller communities by attracting well-paid workers to live and work in their region, rather than in the Twin Cities. Attracting two dozen highly-paid technical workers, for example, with the lifestyle benefits of living in a smaller community, would be the rough equivalent of attracting a medium-sized tech or professional services company – benefitting the community's economy in much the same way. Greater Minnesota should view the move to flexible and remote work arrangements as an employment and community growth opportunity – as they very likely will be.

Minnesota's opportunity to build on food and agriculture sector

Food and agriculture drives a significant share of Minnesota's overall economic activity, contributing \$88.8 billion in total sales, \$29.7 billion in value-added output and 320,000+ jobs.⁶⁰ This represents 8% percent of the state's workforce and 9% percent of state GDP.

The range and breadth of Minnesota's food industry includes not just crop, dairy and livestock production, but also value-added activities such as grain milling, livestock processing, food manufacturing and food marketing. Minnesota's food sector ties and connects the state's diverse economic regions, with a significant \$16.9 billion in food and farm products traded within the state.⁶¹ The state's food and ag sector goes beyond farms and processing plants — it is also a national and global hub for food innovation, technology, management, marketing, sales, distribution and retailing. With strengths and integration across the value chain, Minnesota has significant opportunities for growth this decade. Several strategies could help advance this critical piece of Minnesota's economy:

- **Expand high-speed rural connectivity**
Farming and food production is tech-intensive and will only be more technology-empowered in the future. Mechanization and automation in food processing will continue to accelerate, both to enhance productivity and to stretch workforce availability. Tractors will move toward autonomous operation. Fields will be monitored by sensors

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and satellite for optimal crop conditions assessed by analytics. Modern agriculture is already empowered by technology and connectivity. That need will only grow going forward. Minnesota must ensure that farmers, food producers and rural communities have high-speed connectivity to access the technology they need to grow and thrive producing the food on which we all depend. This includes wide access to high-quality rural broadband.

- **Prioritize regulatory stability**

Farming and food production has always included thoughtful stewardship of land and water resources. Regulatory stability, both from a market perspective and from a tax and environmental standpoint, is the thoughtful framework helping farmers succeed. It is true at the state level, and also of the national and international level relative to stable, reliable inputs and predictable access to global markets. America's farmers are the most productive in the world. Thoughtful regulatory stability and stewardship helps them continue to be.

- **Leverage tech transfer to find market solutions for environmental challenges.**

Technology can help address environmental challenges when and where they occur. But it may be beyond the ability of individual farmers, even groups of farmers, to access. Facilitating tech transfer that helps farmers manage operations while addressing necessary environmental requirements is a legitimate role for the state. Success in this area not only benefits farmers and ag producers but also the entire state.

- **Double down on workforce training to prepare workers for a more technology-based and automated future.**

Farming and food production is leveraging technology to a much greater degree, but farmers and the food industry may need help with tools and training to succeed in a more technology-based future. Strengthening training relative to applied technology and technical skills is an investment that will pay economic awards. It is true across economic sectors, of course, but it may be especially true in food and agriculture, where such skills may not always be resident – but they will be in ever higher demand.

- **Provide greater promotion and support across the food supply chain (e.g., equipment, technology, professional/technical services, manufacturing), not just for producers and processors.**

Food is a major economic sector well beyond the farm. Minnesota is also a major food producer and processor, and our economy benefits substantially from our ability to add value from farm-to-fork via production, processing, engineering, food science, manufacturing and distribution. Along with mining and forestry, food and agriculture is a foundational building block of our economy. Minnesota benefits in myriad ways from the strength and success of this key sector. Providing support and promotion of emerging connections and opportunities across the food supply chain will benefit Minnesota's economy – and is a positive investment.

- **Deepen market expertise, exports and channel expansion in the growth markets of Asia and Africa**

A growing population and a growing middle class will mean the future growth markets for Minnesota agriculture will be Asia and Africa. Each is projected to add 400+ million people by 2030.^{62p} That will result in substantially greater demand for food. Agriculture and food production is a global growth market of tremendous opportunity in the coming decade and beyond. Minnesota food producers should and must continue to deepen their knowledge and expertise in serving Asian and African markets – because they will be the world's growth markets for food.

- **Increase workforce availability through job awareness programs and continued immigration advocacy.**

Workforce availability is a key concern for Minnesota's economic future. With an already high labor force participation rate, but an aging population, Minnesota's workforce constraints will likely only increase by 2030. This is also true – or perhaps even more true – across Greater Minnesota and throughout Minnesota's ag regions. Automation and productivity gains will help. But workforce opportunity awareness, training, and an embrace of immigration will also be required.

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- **Develop statewide emergency response strategies to ensure continuity of food production, distribution and supply in the event of natural disasters or subsequent public health outbreaks.**

If COVID 19 and the global pandemic taught us anything, it is the importance of our food supply and the tremendous value of the Minnesotans who fulfill those important roles for us all. Continuity of food production, distribution and supply is an imperative, especially in the event of natural disasters or public health outbreaks. Food production and distribution is a Minnesota strength that also enables us to help support and supply the nation. Strong and thoughtful planning and response strategies that seek to ensure that food production remains a stable, reliable strength will benefit us all – and should be part of our future planning.

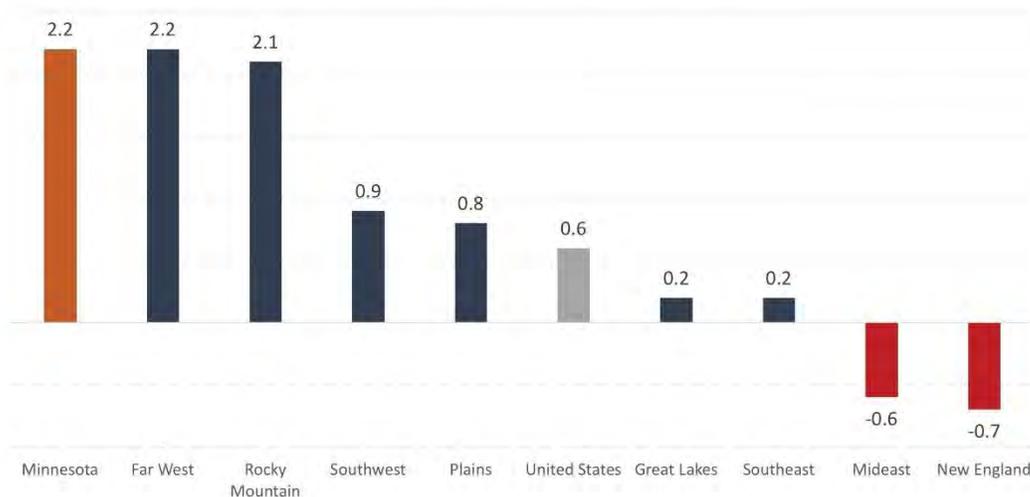
Manufacturing sector

Manufacturing is a key strength and competitive advantage for Minnesota’s economy. The state’s concentration of manufacturing jobs is 29 percent greater than the U.S. as a whole, with six of seven economic regions having above average shares of jobs in the sector. Minnesota has also outperformed regional peers and the U.S. in recent decades. The state’s manufacturing sector grew at 2.2 percent annually since 2007, matching or exceeding every major region in the U.S. Among regional peers (i.e., other Midwest states with large manufacturing sectors), Minnesota’s manufacturing sector grew nearly twice as fast as the second best-performing state and raced ahead of other peers like Wisconsin and Illinois.

As explored in this report, this is due in part to the state’s diversified portfolio of high value-added subsectors, such as medical goods, electronic instruments, transportation equipment and petroleum products – all of which have allowed Minnesota to mitigate negative impacts in other subsectors.

Exhibit 49. Minnesota’s manufacturing sector outperformed U.S. peers

Change in Real GDP (CAGR), Manufacturing: Minnesota compared to U.S. BEA regions, 2007-2019



Source: Minnesota Chamber Foundation analysis of BEA data

Minnesota was an early leader in some of the technologies that are now creating large scale changes, and the state continues to be a hub of high-tech manufacturing (see Tech Sector analysis). Minnesota’s strength in this sector positions the state to compete this decade and leverage technological changes related to Industry 4.0, automation and additive manufacturing.

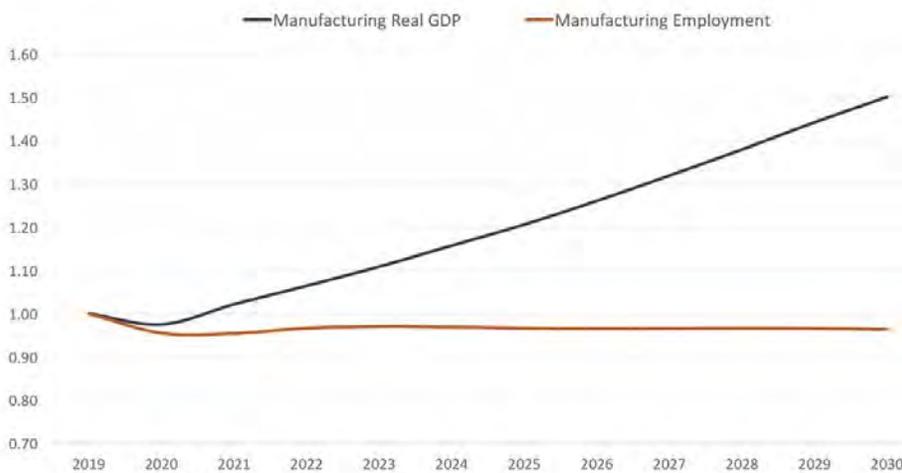
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However, challenges exist that must be addressed. Manufacturing employers continue to raise concerns regarding the availability of workers from entry level to highly skilled talent. Even as sector employment declined in 2020, employers continued to struggle to find workers.

Additionally, automation and technological disruptions are poised to shift the types of skillsets demanded among manufacturing workers in the future. IHS Markit forecasts that value in manufacturing output will grow at a healthy rate even as employment declines this decade, signaling continued productivity gains in the sector. The state has begun to address these trends, but more will need to be done to leverage the potential benefits of new manufacturing technologies while preventing displacement in the state's workforce.

Exhibit 51. Minnesota manufacturing outlook to 2030

Employment and Real GDP Index (2019 = 1.00), Minnesota 2019-2030 (forecasted)



Source: IHS Markit

This report suggests the following strategies to build on Minnesota's critical strength in manufacturing this decade:

- **Retool economic development programs to help manufacturers invest in productivity, not just jobs and facilities.**

Many existing economic development programs were designed primarily to incentivize job creation and investment in new facilities, with funds being awarded based on these criteria. Yet the realities of slowing population and labor force growth in many areas of the state mean that local economic vitality will be increasingly driven by gains in productivity and value creation, rather than job creation alone. Minnesota would benefit from modernizing its economic development programs to create more incentive and flexibility for innovation investments, assigning greater weight to business investments in productivity measures (e.g., technologies, equipment, technical skills training) that can drive greater value-added economic activity for local communities in the future.

- **Help potential workers identify and access careers in manufacturing**

While manufacturing employment is projected to see a modest decline, the need for manufacturing workers remains a challenge statewide with companies reporting openings for both skilled and unskilled positions even in the depth of the pandemic. Progress is being made to rebuild connections to high schools and even middle schools to expose students to manufacturing careers. The benefits of jobs in the trades are also seeing renewed visibility, with the "wood shops" of high schools in the 1970s now being replaced with highly technical manufacturing equipment in some schools. Minnesota Chamber Foundation Business Education Network partner, the Winona Chamber of Commerce,

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developed its REACH program to address the growing gap between employer needs and worker skills, ensuring that students complete degree or certificate programs in areas where they will have meaningful employment options in manufacturing and other high demand industries. These and similar programs must be replicated across the state to further connect students to manufacturing careers.

Manufacturers have a greater challenge attracting adult and incumbent workers to careers in the field. Companies are increasingly investing in education and training to attract workers, providing them with transferable skills and a lifelong career path. Efforts to build the image of today's manufacturing companies as high tech, innovative and engaging workplaces should also help attract potential workers who may have outdated perceptions of the industry.

- **Prepare for a more automated and skilled manufacturing future**

Along with career awareness and alignment strategies, Minnesota should double down on programs geared toward equipping workers and businesses to leverage new technologies in manufacturing. This could include everything from basic digital literacy for production workers to training in automation technologies or data analytics and everything in between. We recommend that programs be designed in partnership with private sector employers with flexibility to fit the diverse range of manufacturing processes employed across the state.

- **Capitalize on reshoring demand by promoting and connecting the state's manufacturing supply chain.**

Recent disruptions in global supply chains have piqued interest in reshoring and nearshoring activities. As discussed in the Markets section, Minnesota should continue building programs and tools to highlight manufacturing supply chains in the state and help create matches between local companies and other businesses looking for domestic suppliers. The Minnesota Chamber's MN Supplier Match has begun this effort by creating a statewide database of suppliers – inclusive of all industries but with an emphasis on manufacturing – that provides key information on close to 1,200 Minnesota companies. Tools such as this can help Minnesota compete for new investments by highlighting their capabilities with companies looking to reshore and/or create shorter links in their supply chains.

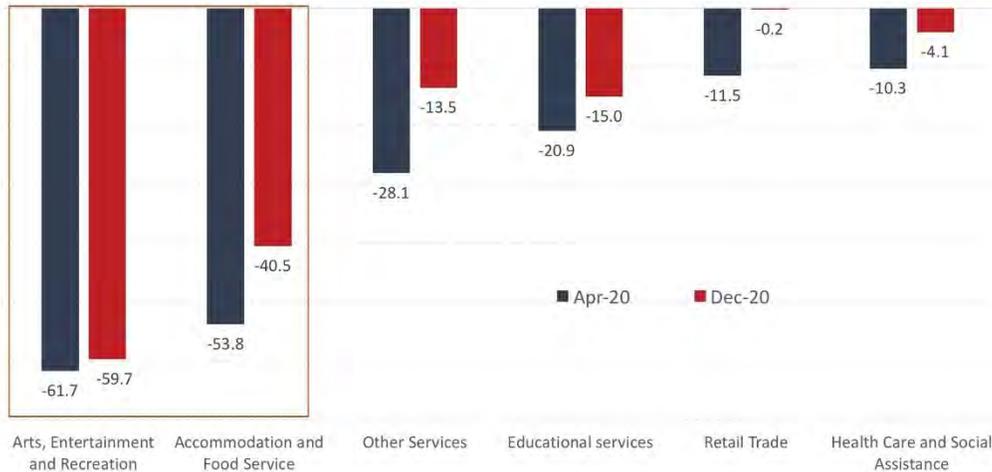
Note: Recommendations here relate to the manufacturing sector generally, with specific manufacturing subsectors addressed by section (e.g., high tech, health care, med tech, etc.).

Hospitality and tourism

The COVID-19 pandemic created divergent impacts on Minnesota's hospitality and tourism related industries. Government interventions to slow the spread of the virus coupled with consumer caution led to staggering losses in the Leisure and Hospitality sector in particular. Sector employment fell by over 50 percent in the spring of 2020. After modest recovery in the summer and fall, employment ticked down again in winter as COVID-19 cases spiked and further restrictions went into place. The depth of losses experienced in 2020 now suggests that overall sector employment may not return to pre-pandemic levels even by 2030.

Exhibit 52. Leisure and Hospitality slower to recover than other hard hit industries

Percent change in total employment (annualized) by industry: Minnesota, April 2020 and December 2020



Source: Minnesota DEED, Bureau of Labor Statistics

At the same time, COVID impacts across the sector have been uneven. *Some hospitality and tourism related businesses saw increased demand in 2020, as Minnesotans traveled closer to home and perhaps took advantage of increased mobility due to remote work arrangements.* Tourism destinations like Minnesota’s Central Lakes and Northeastern regions benefitted most directly from such changes. However, it is possible that a broader range of communities and regions around the state could leverage these 2020 trends to their continuing advantage. On the other hand, hospitality and tourism industries in the Twin Cities metro were left with fewer levers to mitigate the impact of the shutdown in large venue gatherings and business travel activities.

Speaking with leaders across the state’s diverse regional economies, many cited tourism and hospitality as key drivers of community and economic vitality, helping to draw in visitors, talent and business investment to their regions. Additionally, it should be noted that employment losses in this sector had a disproportionate impact on young adults and communities of color, both of which are overrepresented in the sector.

Leveraging new opportunities while addressing the serious challenges experienced in the pandemic by the Hospitality and Tourism sector will be imperative in the coming months and years. Much is still unknown about how the sector may recover and fare in a post-pandemic environment. Harder still is understanding how larger megatrends such as climate change could impact where people choose to travel and live. Minnesota can start now by addressing short-term recovery needs and planning for long term opportunities for growth and development of this important asset to the state’s economy.

- **Relief to hard hit businesses:**

Federal, state and local lawmakers provided direct assistance to businesses that were significantly harmed in the pandemic through no fault of their own. As we move forward, we can speed economic recovery by “doing no harm” and advocating pro-growth/pro-recovery policies for affected businesses, along with technical assistance to businesses with the highest need.

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- **Track emerging trends in tourism, hospitality, and worker mobility as pandemic and restrictions ebb.**

The unprecedented events of 2020 raise questions about long-term impacts on hospitality and tourism activities. Will individuals continue to travel and vacation locally at higher rates, or will tourism-related travel return to a pre-COVID norm once transmission of the virus recedes? How will remote work impact where people choose to live in the future, and what might this mean for communities with recreational and lifestyle advantages? Will entrepreneurship and business investment increase as challenges recede, or will the experience of 2020 dissuade risk-averse investors and owners from investing in new hospitality and tourism ventures? These questions remain unanswered for now. But Minnesota should seek to track, measure, and respond to any emerging trends, developing innovative solutions to address them in the months/years to come.

- **Help communities leverage their assets to attract investment and talent to their regions**

Communities can also begin developing programs and initiatives to take advantage of emerging opportunities brought about by the pandemic now. For example, what might communities near Minnesota's north shore do to attract young professionals who work remotely in a large urban center, but who may prefer the lifestyle amenities and outdoor activities the region has to offer? What would be the implications of such a strategy for local housing, infrastructure or schools?

Aside from more novel initiatives, communities should continue developing and promoting their recreational and lifestyle assets to attract visitors, talent and business investment. These efforts and investments have the double benefit of increasing the quality of life for existing residents, while spurring new potential economic activity.

- **Address long-term workforce needs through local partnerships and immigration**

Workforce availability challenges have mounted in recent years for hospitality businesses. Often, this industry provides young workers with their first jobs, and that introduction can lead to career opportunities in the hospitality industry. The Minnesota Chamber Foundation's partnership with the Brainerd Lakes Chamber in the Pro-Start program is an example. Pro-Start is a two-year curriculum in culinary arts and food service management that trains and provides workers for area resorts while also launching new professionals in hospitality careers. The Hospitality Minnesota Foundation is also a sponsor of Pro-Start, along with Hospitality Tourism and Management programs in select schools across the state. Career development opportunities aside, the Hospitality and Tourism industry is likely to face continuing workforce shortages as the economy recovers, just like many other industries across the state.

Those shortages could be mitigated in part through greater attraction and employment of immigrants and new Minnesotans. Certain industries may be especially helped by greater recruitment and retention of individuals with H2B visas. The political nature of immigration reform and year-to-year uncertainty about the availability of visas makes this very challenging. Minnesota's hospitality sector and several other industry sectors rely on foreign workers with H2B visas annually, many returning year after year. Without these workers, hundreds, perhaps thousands of jobs would go unfilled. Thoughtful national immigration reform, including clear guidelines and increasing access to foreign workers would help Minnesota's hospitality industry.

Markets: Leverage strengths to increase trade locally and around the world.

Minnesota's economic future depends in part on its ability to compete in markets locally and around the world. The state can drive economic activity this decade by enhancing supply chain activity and leveraging these strengths to help businesses expand in the state. Minnesota can also look to foster continued trade with the state's largest trade partners, such as surrounding Midwest states and international neighbors such as Canada and Mexico. Further, the state can look to accelerate trade to fast-growing economies around the world that present new market opportunities.

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- **Promote and connect specialized supply chains.**

Trade within Minnesota makes up a significant component of the state's economy. The flow of goods within the state was valued at more than \$83 billion in 2017, with intrastate activity helping tie together the state's diverse economic regions.⁶³

The state's supply chain strengths in areas such as medical technology, food and agriculture, wood products, and machinery and equipment manufacturing give Minnesota a competitive advantage for businesses looking to expand in the region. Machinery, food and ag products, and transportation equipment make up a large share of intrastate trade in nearly every region in the state, demonstrating the strong linkages across regions in these sectors.

IHS Markit also estimates that firms in sectors such as building construction and furniture manufacturing can obtain up to two thirds of their wood product inputs from Minnesota suppliers. And research from Munnich and Horan found that Minnesota has a significant statewide presence of firms in the medical goods supply chain, reinforcing the state's competitive advantages in this industry.⁶⁴

These strengths and the knowledge of state supply chain capabilities and trade flows are vital tools to support growth and expansion of businesses in related industries. Yet visibility into the businesses that make up these supply chains remains too limited. Programs like the Minnesota Chamber of Commerce's MN Supplier Match have begun to address this need and can play a role in reducing asymmetric information in the marketplace. This is particularly timely as global trade disruptions from tariffs and COVID-19 are leading firms to move away from sole source supplier arrangements and otherwise seeking to reduce reliability and delivery risk in their supply chains.

- **Identify supply chain gaps.** More research should be conducted to identify supply chain gaps, particularly in key industry clusters and emerging growth sectors.

Organizations like the Agricultural Utilization Research Institute and others have conducted studies to identify and respond to such gaps. Clear identification of supply chain gaps could be used to attract targeted businesses to the state.

- **Open doors to markets, both domestic and foreign.**

Proximity and size remain key factors in state exports to domestic and international markets. A high share of Minnesota's domestic commodity outflows go to neighboring Midwest states and the largest states, including California and Texas. In 2017, 53 percent of the Minneapolis Bureau of Economic Analysis region's total outflows (which covers most of Minnesota) went to just 9 states. Midwest states play a particularly large role in regional trade of food and agriculture products.

Spotlight: Connecting the supply chain through the MN Supplier Match program

MN Supplier Match is an initiative of the Minnesota Chamber's Grow Minnesota! program, designed to help companies source and connect with Minnesota suppliers, the initiative launched in 2017 to increase information and accessibility to the state's robust supply chain.

MN Supplier Match enables any business to search a database of some 1,200 suppliers across industries, and regions of the state. Additionally, Minnesota Chamber staff offer direct assistance matching companies to potential Minnesota suppliers and hold regular events to foster connections between companies in selected industry sectors.

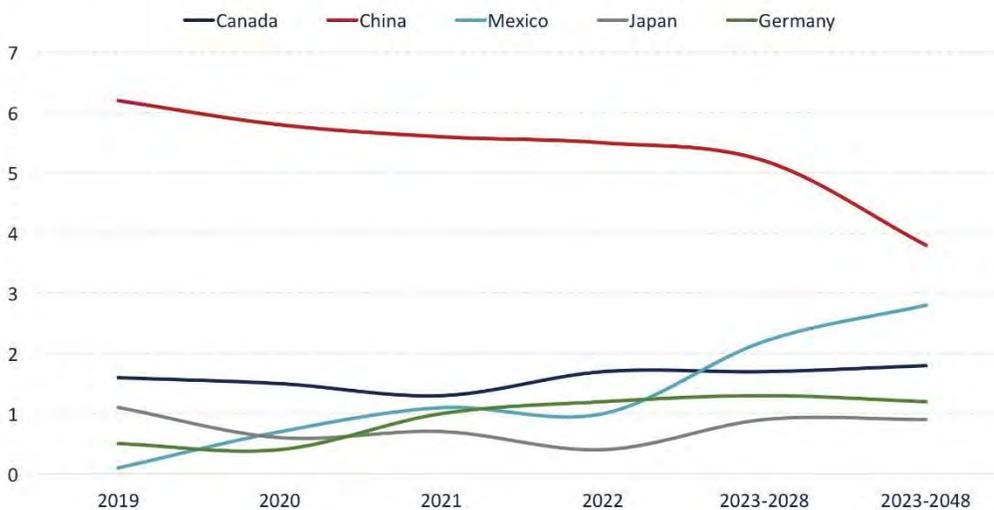
While still a relatively new program, tools such as this can act as a clearinghouse of information, helping to enable import substitution, business attraction/expansion, and reshoring strategies.

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Similarly, approximately 44 percent of Minnesota's total international exports went to just three destinations in 2019 – Canada, Mexico, and China.⁶⁵ Despite recent federal trade disruptions, these countries are likely to remain critical partners for Minnesota in the years to come, particularly with the USMCA trade agreement providing long-term stability to North American trade. While many companies have looked to countries like Vietnam and Thailand as an alternative to China, Mexico's long-term growth prospects and close proximity to the U.S. could present advantages for firms looking to nearshore or diversify their supply chains in the future. Minnesota should continue fostering relationships, distribution channels, and support infrastructure to further develop these important end-markets for the state's goods and services.

Exhibit 53. Long-run GDP forecast of Minnesota's largest trading partners

Real GDP CAGR by Country: 2019-2048 (forecasted)



Source: IHS Markit

- **Accelerate trade in fast-growing regions in the U.S. and abroad.**

While the state's largest export markets will remain important, Minnesota should look to accelerate trade in regions projected to grow the fastest over the next decade. As IHS Markit notes, the fastest growing economies within the U.S. will be in the South and West. States like Texas and Washington are already important destinations for Minnesota exports and are projected to continue expanding at fast rates this decade. Efforts should similarly be directed towards states like Arizona, Colorado and Utah that may offer a balance of fast-growing markets and reasonable proximity. This should include further research regarding infrastructure and the direct flights and shipping modes needed to fully compete in these growing regions. For example, initiatives like Greater MSP's Regional Air Services Partnership (RASP) can aid this effort by collecting information from companies on markets they anticipate needing greater flight access to – and communicating this demand to the airlines in an effort add direct flights to these markets. Minnesota should continue to advance such strategies to ensure Minnesota businesses have the access to move people and goods to key markets and fast-growing markets in coming years.

Exhibit 54. Minnesota's major domestic markets include regional neighbors and large coastal states

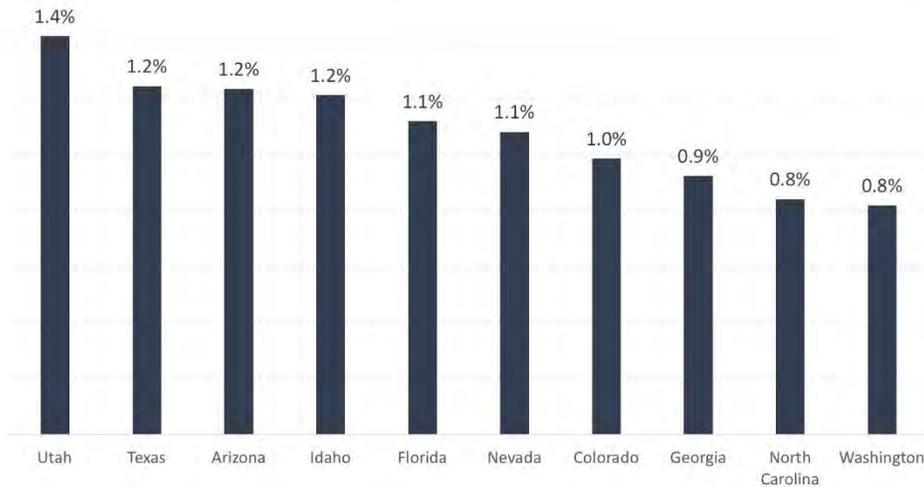
Total outbound commodity flows from Minnesota, 2017



Source: IHS Markit

Exhibit 55. Population projected to continue shifting to sunbelt and western states this decade

Total population growth by state (CAGR): 2020-2030



Source: IHS Markit

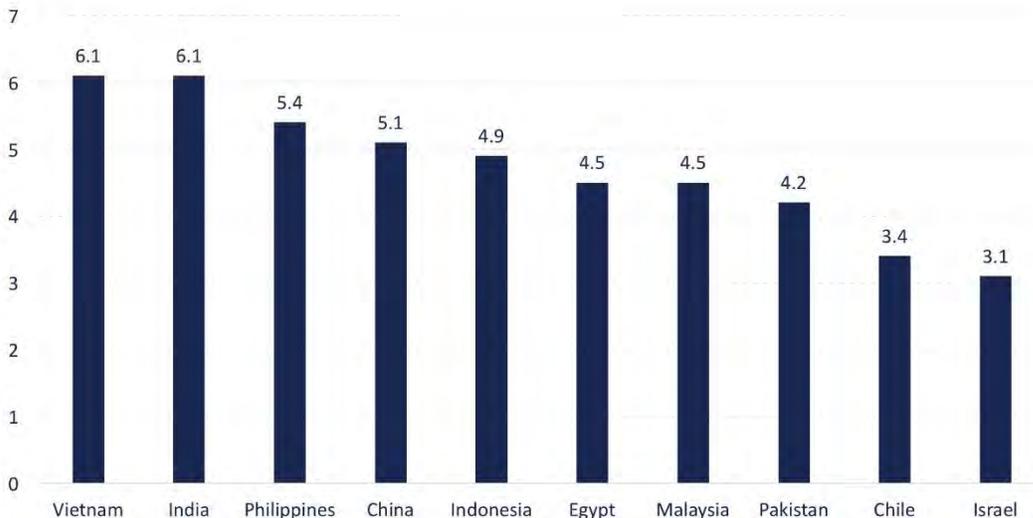
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Beyond the U.S., global growth is expected to continue shifting toward Asia, Africa and the Middle East. Asian economies will be by far the fastest growing source of demand over the next decade, and countries like Egypt and Israel are expected to expand at healthy rates as well. Africa's growing population and growing population will present growth opportunities as well. Minnesota's export orientation would fruitfully shift in these directions.⁶⁶ The state has significant ties to China already, but opportunities will also be present in fast growing economies such as Vietnam and India.

The state's export promotion entities, including the Minnesota Trade Office, have already begun building in-roads to these growing markets, helping Minnesota companies export to regions such as Israel, India, and Southeast Asia. Here too initiatives like the Regional Air Services Partnership (RASP) are helping build connections between Minnesota and its critical international growth markets. In 2019, Delta began offering non-stop flights from MSP to Seoul and Mexico City, two important economic hubs for the state's businesses and exports. This is in addition to past efforts to create direct flights to markets such as London, Paris, Dublin, Tokyo and Amsterdam. The state should look for ways to continue to cultivate trade connections, relationships and expertise in key markets and growth regions which will play an increasingly important role in the coming years.

Exhibit 56. Fastest growing economies this coming decade

Projected change in GDP (CAGR) by country: 2020-2030



Source: IHS Markit

Exhibit 57. Indian Subcontinent/Middle East and Far East projected to lead in import growth



Source: IHS Markit

- Innovate to expand goods and services exports this decade.**

Minnesota’s strengths in electronic instruments, medical goods, machinery and equipment, agriculture and natural resources give the state comparative advantages in the global economy and help drive the \$22.2 billion of Minnesota goods exported in 2019. While harder to track, Minnesota service exports also offer sizable and fast growing opportunities to grow the state’s global trade activities.

The Minnesota Department of Employment and Economic Development (DEED) estimated that Minnesota service exports were valued at \$14 billion in 2019, and the Coalition of Service Industries estimates that the state’s service exports grew by over 63 percent from 2008-2018.⁶⁷ Such service exports include professional and business services, transportation and travel services, intellectual property (i.e., licensing/fees, etc.), financial services and more. As software and digital technologies grow in Minnesota, export opportunities are poised to accelerate and with it the need for technical and financial assistance to help Minnesota firms navigate the legal and regulatory components of digital trade.

Additionally, aging populations across developed countries are leading to rising global demand for health care and wellness services. Major Minnesota trading partners such as Germany, Japan, and South Korea are all projected to have among the highest population shares of people over 65 by 2050. For instance, over 36 percent of Japan’s population will be over age 65 by 2050, compared to only 12.7 percent of the population in India.⁶⁸ This means that Minnesota’s medical innovation sector has an opportunity to lead in the export of health and medical knowledge and services – not just goods – to help serve these aging populations in the future. The state is already an exporter of health care services and may be especially well positioned to capture market share in global health care services in the next decade. More research should be conducted to examine how Minnesota can leverage this emerging opportunity.

Strengthen innovation assets in regional economies

While a full assessment of regional economic opportunities is beyond the scope of this report, it is important to note some of the distinct assets and opportunities that can drive growth in Minnesota's regions this decade.

Key regional clusters:

As noted earlier, Minnesota's economic regions possess certain industry specializations that present their own challenges and opportunities (see Appendix for industry specializations by region). In some cases, regional industries may be made up of a large number of competing firms and suppliers. In other cases, a regional industry may represent only one or two large firms. Therefore, strategies to build on regional strengths may differ based on the circumstances.

Four tenets should be helpful as regions assess how to build their particular strengths:

- **Business retention is a first priority**
Business retention strategies are fundamental to collecting on-the-ground insights and responding to emerging needs, concerns, or growth opportunities of sectors and existing businesses in a region. Programs such as the Minnesota Chamber of Commerce's Grow Minnesota! program can help support and grow key industry clusters.
- **Industry strengths can spur entrepreneurship and attract business investment**
Regional stakeholders can leverage industry strengths to spur entrepreneurship and attract new investment. Recent examples of this include accelerator programs such as Techstar's Farm-to-Fork and OnRamp Insurance Accelerator that use existing Fortune 500 companies to provide resources, connections and training to high growth-potential startups. This approach could be replicated regionally, using leading firms in regional economies to support and partner with startups in related fields. This also includes encouraging regionally locating spin-off ventures that may come directly out of existing regional companies.

Alternatively, certain regions may choose to build on existing industry clusters by working to attract targeted investment and talent from outside the region. Initiatives such as Green Seam in Southern Minnesota are a prime example of such an approach. Green Seam builds strategies to promote the region's national competitiveness in advanced food and ag activities, and by attracting related business investment to the region.⁶⁹

- **Help legacy industries innovate through tech-transfer and adjacent industry opportunities.**
Fast-changing market trends require continual innovation and adaptation. Minnesota has long benefited from tech-transfer activities that leverage research institutions to find new markets and technologies for key industries, such as agriculture, mining, forestry and so forth. The University of Minnesota and other research/tech transfer entities should continue to seek and explore opportunities for legacy industries to diversify and adapt to changing circumstances.
- **Ensure public policies empower rather than discourage development of key industries**
Public policy can play an important role in enabling or restricting the continued development of important industry clusters. Regulatory concerns over new developments in mining, agriculture, and energy (among others) should be carefully considered as regional economies look to build on existing industry strengths.

Innovation support:

In addition to strategies that target existing industry strengths, regional economies can foster organic economic growth through entrepreneurship and support of fast-growing businesses. A number of programs and initiatives have emerged in recent years to do exactly this.

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Recent initiatives to spur entrepreneurship and innovation in Minnesota's regional economies include:

- Launch Minnesota
- Entrepreneurs First (E1) Network
- Mankato's Center for Innovation and Entrepreneurship
- MN Cup
- Twin Cities accelerator programs (e.g. BetaMN, Techstars, etc)
- Southern Minnesota Initiative Foundation's Rural Entrepreneurial Venture (REV)
- LaunchPad Bemidji
- gBeta St Cloud
- Great North Labs Lean Startup School

This small sample of recent initiatives all largely focused on boosting entrepreneurship and startup activity in Minnesota's economic regions. Minnesota should continue to support and evaluate these nascent, business-building efforts to identify successful models that could be expanded and/or replicated across the state.

Build on quality of life advantages to attract talent and entrepreneurs:

As mentioned, regions with recreational and livability assets, such as Minnesota's Central Lakes region, have seen positive population growth in recent years. And research from the University of Minnesota has uncovered a consistent pattern of in-migration among 30-49 year olds choosing to move to or return to rural communities in the state.⁷⁰ This strongly suggests underlying "pull factors" that could be strategically leveraged to help attract talent and innovators to Greater Minnesota – and grow the potential workforce. Further, while the long-term impacts of COVID-19 on migration patterns are still unknown, some signs suggest that Greater Minnesota communities may benefit from trends such as remotework and flexible work arrangements that would allow or enable individuals from larger urban areas to work from locations that offer greater affordability, livability or other lifestyle advantages. It is too early to tell how such trends may eventually play out, but regional economies can start building strategies now to capture such potential opportunities.

Regional industry spotlight:

Northeast Minnesota's mining and forestry sector

Mining and forestry are important Minnesota industries even more important regionally.

Mining has a relatively small footprint statewide, but the concentration of metal ore mining industry jobs in Minnesota's Northeast region is over 96 times the U.S. average. Long a driver of high wage employment, mining has long been a pillar of regional and statewide economic output. For example, Minnesota currently mines 85 percent of the iron ore used to manufacture American steel. In 2019, Minnesota's ferrous (iron) mining industry counted 4,000 jobs, with nearly 5,000 additional jobs created through indirect and induced effects.⁷¹ The sector faces headwinds, but mining employment in Minnesota has been relatively stable the last several years. Conscious of energy costs and challenged by global competition, the industry is currently shielded somewhat by tariffs on imported steel. However, opportunities also exist to revitalize the mining industry's significant economic strength by achieving advancements in pellet production to create inputs more suitable to electric arc furnaces, as well as multiple other new project developments.

The greatest potential opportunity for growth in Minnesota's mining sector lies in non-ferrous mining – material not containing iron. The Duluth Complex is one of the world's largest deposits of nickel, copper and other precious minerals. Notably, these minerals are essential for major "green economy" efforts, including hybrid and electric vehicles and the domestic production of wind turbines. PolyMet and the Twin Metals Minnesota project have already infused more than \$450 million in investment in the state's economy over their project lifecycles to date, with the projects contributing a forecasted \$3 billion in future revenue for the Minnesota Permanent School Trust Fund.⁷² These projects continue to face intense scrutiny, however, including regulatory and legal challenges at both the state and federal level.

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The projects continue to face intense scrutiny, however, including regulatory and legal challenges at both the state and federal level.

Forestry also continues to be an important contributor to Minnesota's economy and is especially important to specific regions of the state. According to the most recent (2017) USDA Forest Resources of the United States report, forest land makes up an estimated 34 percent of Minnesota's land area – or nearly 17.5 million acres – the greatest concentration of which is in northern Minnesota.⁷³ A recent report indicates that the industry provides nearly 68,000 jobs producing \$7.3 billion total value in Minnesota's economy.⁷⁴

Forestry also faces industry-specific challenges, including an aging workforce and declining demand for certain products. That decrease in demand has led to mill closures in recent years. However, the forest industry continues to see innovation opportunities ahead, including mass timber and other materials for building construction, high demand paper grades, biobased packaging and emerging market needs around biomass and bioenergy, to name a few. A number of organizations are focused on innovation and opportunity developing in the sector, including the University of Minnesota, Agricultural Utilization Research Institute (AURI), Natural Resources Research Institute, and industry leaders such as UPM and others.

Growth Accelerator **Invest and build on Minnesota's health care and medical cluster**

Minnesota is a global leader in health care. The state is already home to notable health care giants, such as Mayo Clinic, UnitedHealth Group, and Medtronic, and has among the highest share of medical device manufacturing in the nation.

Health care services led job growth among all Minnesota industries the past two decades, making health care the largest employer in six of Minnesota's seven economic regions. Further, the state's emerging growth in biotechnology, pharmaceuticals, and digital health point to new phase in Minnesota's evolving health care landscape.

The opportunity over the next decade is to innovate and further establish Minnesota as a global leader in health care innovation.

Health care will leap forward this decade. Technology advancements, consumer engagement, coverage innovation, consumer-driven delivery, device innovation, evolving risk-sharing, remote care, and telehealth are exciting opportunities. In contrast, rising demand, demographic change, rising costs and growing financial pressures, among other factors, will raise temperatures in the sector.

The strongest health care innovators will survive and thrive this decade.

This bodes well for Minnesota. Change brings both opportunity and risk for Minnesota consumers, employers, providers, insurers and producers across the health care value chain. Minnesota has demonstrable foundational strengths that position it exceptionally well to capture opportunities amidst change, not least because of Minnesota's enviable cast of health care leaders across delivery, insurance, data analytics, consumer insights, pharma, medical devices and other health care technologies.

Success is not guaranteed. Minnesota's health care sector faces challenges as well, including competition from internet companies, retail giants and scores of other entrants large and small from Silicon Valley to Israel to Belgium to China. Emerging innovators and competitors could threaten Minnesota's medical cluster – or empower it. For example, Google,

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Microsoft and Tencent are already responsible for more than 70 percent of the deals made for digital health startups, according to CB Insights.⁷⁵ Morgan Stanley projects Apple's healthcare revenues could hit anywhere from \$15 billion to \$313 billion by 2027.⁷⁶ Amazon is investing big in pharmaceutical services and digital health solutions. And Walmart is increasing its already large presence in health care, expanding with new initiatives in retail clinics, virtual care, even insurance.

These same trends can be an opportunity. Minnesota has a cluster of firms in wellness related industries such as sports, fitness, and outdoor recreation, helping it compete in the \$4.5 trillion global wellness market. Minnesota has strengths in connected products, data analytics, and retail, all of which can be leveraged as well. Recent investments into the health care space by non-traditional players, such as Best Buy and Anytime Fitness, are representative of such trends.

Stakeholders in the state's business community, public sector, and industry support sectors should consider strategic choices to further support, strengthen and grow this critical aspect of the state's economy.

Minnesota's existing health care cluster is arguably unique and an important leverageable asset that will play an outsized role in shaping Minnesota's economic future through 2030 and beyond. We recommend actions that would boost investment and provide support where Minnesota's health care cluster needs it most.

Strategies include:

- Unlocking the potential of technology-fueled innovation through smart investments in infrastructure, talent and regulatory changes.
- Acknowledging the economic importance of Minnesota's health care cluster to reinforce and advance Minnesota as a center of global health care innovation.
- Retaining and attracting a greater share of the people and expansion investments being made by existing Minnesota medical and health care companies.
- Fostering and better supporting high-growth medical and health care startups.
- Addressing workforce availability through local/regional partnerships, regulatory reform and talent attraction/retention strategies.

Minnesota is well-positioned to lead in health care and medical innovation this decade

Established strengths



Industry Leaders (examples)

- Mayo Clinic
- UnitedHealth Group/Optum
- Medtronic
- 3M
- Boston Scientific
- Abbott
- Starkey Hearing Technologies

Industry Concentration Relative to U.S. economy (location quotient)

- Med devices9.98x U.S. avg
- Med equip/supplies.....x
- Insurance carriersx
- Med equip wholesale.....x
- Hospitals.....x

Other Key Metrics (examples)

- Optics/Medical goods are #1 state export, valued at \$4.6 B in 2019
- Ranked 3rd in U.S. for medical patents per 1 million ppl; ranked #1 in two sub-categories
- Ranked 1st nationwide in concentration of medical device manufacturing jobs
- Ranked 2nd nationwide in concentration of biomedical engineers

Emerging growth



Biotech and Pharma

- Pharmaceutical exports grew 7x since 2002, 6th largest state export
- Pharmaceutical mfg employment grew at 7.8% a year from 2014-2019, 2nd fastest across the state's medical portfolio
- \$650 M raised by biotech companies in Minnesota since 2010 (Medical Alley Association, 2020)

Digital Health

- Digital Health startups raised \$664 M in 2019, 1st across all categories (Medical Alley Association, 2019)
- Major digital health startups/rising stars include: Bind, Carrot Health, NovuHealth, Gravie, Revel, etc.
- "Why Minnesota is poised to be a hotbed for digital health startups" (VentureBeat, 2017)

Making moves (Major investments and initiatives)



New entrants

- "Best Buy CEO Eyes Health Care as Retailer's 'Next Big Thing'" (Bloomberg, 2019)
- "Dr. David Katz Joins Forces With Anytime Fitness, Self Esteem Brands To Amplify How Fitness - As Lifestyle Medicine - Matters More Than Ever" (PR Newswire, 2020)
- "Sleep Number, the Leader in Sleep Innovation, Unveils the Future of Health and Wellness at CES 2018" (Sleep Number, 2018)

Major investments

- Minnesota early stage health care companies raised a record breaking \$1.4 B in 2020.
- Bright Health and Bind raised a combined \$605 M in 2020, amounting to half of all funds raised by U.S. health plan companies (Medical Alley Association, 2020).
- Destination Medical Center – Mayo Clinic-driven initiative to invest \$5.6 B over 20 years in Rochester, Minnesota.
- Health Village – Ryan Construction plans to develop 400 apartments, 150 units of rental senior housing and 1.1 million square feet of offices and specialty medical space to create a "healthy village" model in Maple Grove.
- Vision Northland—Essentia Health will invest \$900 M new and renovated facilities in Duluth.

Minnesota's health care and medical technology sector

Minnesota has numerous strengths that position the state to lead in health care innovation this decade, fueling future growth in the state's economy and contributing to the health and well-being of people around the world. As COVID-19 has revealed, the global population relies on medical knowledge, including technologies and goods produced by Minnesota's health care sector. Yet challenges and risks to this key sector must be addressed to fully capture the opportunities at hand. The following recommendations should be considered:

- **Address barriers to technology-fueled innovation through smart investments in infrastructure, talent, and regulatory changes.**

Transformative technologies are poised to ripple throughout the health care sector this decade, providing opportunities for value-creation, cost efficiencies and improved health outcomes. However, important innovations can only be unlocked to the extent that regulatory environments, infrastructure, and workforce capabilities allow. Minnesota has strengths to build on but is lagging in important areas. Attention to these issues would further Minnesota's ability to carve out distinct competitive advantages against U.S. peers and around the world.

- **Regulatory barriers to virtual care and interoperability:** Minnesota has long prided itself on developing innovative care models and rigorous data privacy rules. However, there are important areas in which Minnesota finds itself an outlier with respect to its health care regulatory framework. For example, Minnesota is currently one of only seven states that mandate parity in payment for telehealth services relative to care provided in-person, regardless of the differences in costs or outcomes associated with these respective care settings. This requirement was passed in 2015, and was originally intended to ensure the growth and development of a robust menu of telehealth services in Minnesota. It was part of nation-leading legislation at the time that put Minnesota at the forefront of telehealth law and regulation. But the explosion of telehealth during the COVID-19 pandemic has fundamentally changed its role in our health care system – warranting a fresh look at Minnesota's laws. Thoughtful, flexible, and forward-looking policies could and should balance the expectations of providers, payers, and patients while leveraging the many benefits of telehealth to increase access to care, address health care disparities and inequity, improve quality and outcomes, and lower costs. The absence of such policies could instead act as a barrier to expansion of telehealth in the state, potentially inhibiting both the economic benefits of efficient care delivery and the access to services that more robust deployment of virtual care would enable.

Additionally, Minnesota's past innovations in data privacy has cut both ways. On one hand, Minnesota has developed rigorous rules to protect patient confidentiality through state level regulations. Minnesota's Health Records Act – created prior to national HIPAA laws – now leaves the state with overlapping and redundant rules that work against efforts to better coordinate patient care, improve outcomes, and lower costs. Minnesota similarly places unnecessary restrictions on the use of its All-Payer Claims Database, significantly limiting its usefulness as a tool to leverage de-identified health insurance claims data to lower health care costs and improve the quality of care. As a result, a state report card from the University of California Hastings College of Law assessing each state's progress on price transparency gave Minnesota an unimpressive grade of "C" in 2020 (though an improvement from Minnesota's "F" grade in 2017.⁷⁷

While a full analysis of such issues is beyond the scope of this report, Minnesota should assess and address the barriers to innovation it may have inadvertently created by modernizing its rules in these and other critical areas.

- **Workforce training:** As new technologies accelerate, the skillsets of Minnesota's medical workforce will be required to evolve as well. This includes equipping doctors, nurses and other practitioners with the skills to

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leverage new technologies effectively. But it also includes meeting the rising demand for tech talent (software developers, data scientists and analysts, systems analysts, etc.) across delivery, insurance, and medical goods and services industries. The recent announcement of Google's first Minnesota facility in Rochester is emblematic of the growing fusion between technology and medicine. Minnesota's ability to foster continued investment from health care leaders will be dependent in no small part on its ability to cultivate the tech talent needed to expand and support such activities in coming years.

- **High-speed broadband:** Minnesota also requires broad and reliable digital connectivity across the state to advance access to care and support health care activities. Broad access to high-speed internet is not just an economic imperative, but also a public health imperative, especially for rural areas with fewer care providers in their communities. Minnesota should take steps to fast track its goals to provide and ensure border-to-border connectivity.

- **Acknowledge the economic importance of Minnesota's health care cluster to reinforce and advance Minnesota as a center of global health care innovation.**

Minnesota's health care cluster is tremendously important to the state's economy. But often even Minnesotans don't recognize Minnesota's health care sector as the global innovation leader and economic growth engine it really is. Acknowledging the economic importance of Minnesota's health care cluster is important to reinforcing and stewarding it economically. Not only is Minnesota home to leading health care companies such as UnitedHealth Group, Mayo Clinic, and Medtronic, alongside many others in the core delivery, insurance, device, supplies, and bio/pharma industries, but the state also has notable assets in emerging areas such as retail health, wearables, and wellness. Not to mention the complementing wellness components of the food sector, which have overlapping talent and infrastructure needs.

Fostering collaboration and cross-industry partnerships could help Minnesota better compete with Silicon Valley and other high-tech hubs around the world in growing our health care sector in the years to come. Initiatives are already underway to promote Minnesota as a global hub of health care innovation, including Medical Alley Association's national branding campaign to attract talent, investment and profile, and its Healthcare Transformation Initiative, the newly created Global Wellness Consortium, the Health Village development in Maple Grove, and of course Rochester's Destination Medical Center, which is investing \$5.6 billion over 20 years. All are foundational elements intended to continue to build on the success of Minnesota's health care cluster in ways that also have potential to bring in additional communities and benefit additional stakeholders along the way. Part of Minnesota's efforts to reinforce and steward its health care cluster should aim to help Greater Minnesota communities diversify their medical portfolios, including supporting startup and expansion activities for healthcare-related companies outside of the delivery sector.

- **Retain investments from existing medical companies.**

The economic powerhouses within Minnesota's health care cluster continue to grow and expand – but too often that growth is not happening in Minnesota. There are several reasons. In some instances, employment growth in Minnesota may be limited by access to talent. The state's tax and regulatory climate may play a role. Or individual companies may be consciously diversifying geographically for strategic reasons of their own. Whatever the reason, Minnesota is demonstrably losing a portion of its potential employment growth to other states and nations. Despite Minnesota's many strengths, the state needs to improve its ability to retain a greater portion of that growth and investment by and from the state's existing healthcare industry leaders. The state's challenges in this area are not limited to healthcare. A shortage of available workers in key areas of need, such as software development – as well as business climate concerns – contribute to companies across industries and sectors adding jobs and capital investment in places like Texas and Colorado, rather than Minnesota.

Remote work arrangements could heighten this challenge if top talent chooses to live in warmer, lower-cost states

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while continuing to work for a Minnesota employer. This is especially important as Minnesota has traditionally benefitted from spin-off ventures emerging out existing companies, such as Optum or Bright Health. Minnesota should consider how it can better retain top talent and increase the likelihood that healthcare spin-offs and job creation is happening here, not elsewhere.

- **Foster and support high-growth medical startups.**

One of Minnesota's greatest success stories is the history of its many startup companies that have created entire industries. Medtronic was once a startup. UnitedHealthcare was once a startup. 3M was once a startup. Mayo Clinic was once a startup. Startup success has been one of the great threads of Minnesota's economic history. Some of that success was the result of geography, but much of it was the result of individual ingenuity, hard work and good fortune. Despite Minnesota's many strengths, the state does not have strong mechanisms to support and foster potential new high-growth medical startups, and needs to improve its ability to spur startup growth and retain investments made by the state's existing industry leaders. A number of recent programs have been developed to better attract and support high-growth potential startups, including startups in the medical sector, such as BETA Medtech and Medical Allery starts. While these early efforts are promising, businesses and public leadership should seek to build on these efforts, devoting particular attention to startups in the medical and health sectors.

- **Address workforce availability through local/regional partnerships, regulatory reform, and talent attraction/retention.**

Minnesota will need more workers across health care and med-tech fields this decade. This includes workers in health care delivery – nurses, physicians, support staff – as well as individuals with health care knowledge in related fields. For example, software developers with basic knowledge of the health care industry will be valuable in Minnesota's insurance and medical technologies industries. Other industries -- such as long-term care and home health care – already face significant challenges finding and retaining workers, and this challenge is only poised to intensify over the next decade.

While no one solution can solve this challenge, targeted industry programs can help. Health care providers are investing in workforce initiatives to help build a pipeline of skilled and diverse talent for the industry. For example, Mayo Clinic is investing in attracting young and diverse talent into gateway health care careers.⁷⁸ This program not only seeks to attract and train talent for existing jobs, such as nursing assistant or medical assistant, but also to foster career paths through which graduates gain valuable work experience that can help them decide to further their education and training to advance to higher-level positions and certifications. This is one example of many already operating across the state, but more attention is needed to attract and train the health care workers necessary to grow Minnesota's health care cluster through 2030.

Growth Accelerator **Compete and succeed in the future Technology Economy**

Technology has brought sweeping, fundamental change to the global economy for over thirty years, but the pace of changes seems to now be accelerating. While Minnesota was an early leader in tech development, it has trailed peer states and the U.S. as a whole in recent years. This seems true whether one defines the “tech sector” by technology industries, occupations, or a combination of both. Indeed, sluggish growth in Minnesota's high-tech industries and tech occupations has been a source of underperformance in the state's economy for almost a decade, and forecast data projects an underwhelming future if Minnesota does not change.

The tide may already be turning. New technologies are bringing transformation across a wider set of industries, redefining what it means to be a “tech business.” Within this changing landscape, Minnesota has significant strengths that position it

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well for growth in emerging technology fields.

First, despite below-average growth, Minnesota has a high share of jobs in technology industries and occupations. The state has the 13th highest concentration of High-Tech employment (as measured by employment in 65 high-tech goods and services industries), and the 11th highest concentration of Net Tech Employment (measured as a net sum of jobs in tech industries and tech jobs that occur in any industry).⁷⁹

Minnesota also has above average concentrations of tech talent, with 13 percent more IT professionals than the U.S. average, 15 percent more STEM occupations, and 14 percent more business services occupations. Thus, Minnesota has bench strength in advanced industries and the talent needed to excel in tech activities this decade.

Second, Minnesota remains a leader in advanced fields, such as corporate headquarters, financial services, health care and medical technology, machinery manufacturing, to name a few.

What does this mean for Minnesota?

Each of these industries is also undergoing a transformation in what they produce and how they operate. Whether through digital transformation, data analytics, artificial intelligence, machine learning, internet-of-things, 3D printing, cybersecurity, block chain or automation – firms in these industries will be on the forefront of technology changes this decade.

This means Minnesota does not have to *build* a new industry – its existing industry clusters and innovative businesses will help drive tech growth in the coming years.

Take the Internet-of-Things (IoT), for example. Verified Market Research estimated the value of the global IoT market at \$212.1 billion (USD) in 2018 and forecasts it will grow at a compound annual rate of 25.7 percent, reaching \$1.32 trillion by 2026.⁸⁰ Minnesota has the critical elements needed to compete and lead in IoT related activities, as businesses across industries find ways to advance connectivity and leverage Big Data.

Minnesota's strengths in this emerging tech field include:

- *Being home to notable corporate headquarters and industry leaders across a diverse range of sectors already investing big in IoT strategies.* Consider Toro, headquartered in Bloomington. As Matt Main of Axiom describes: “Toro has an offering called My Turf, in which sensors are placed on equipment to capture and analyze real-time data about performance metrics of mowers. The technology lengthens equipment life and minimizes maintenance costs. When issues arise, the program notifies operators and allows for scheduled service activities and parts ordering.”⁸¹ And innovative IoT solutions such as this are already being developed across Minnesota's diverse corporate and industry sectors that will present significant growth opportunities in the years ahead.
- *Being home to core IoT-related technology producers that enable connected products.* Minnesota has high concentrations of employment in electronic instruments, semiconductors, and communications devices. Activities in this area are driven in part by firms like Banner Technologies, Emerson, Digi International, Multi-Tech, SkyWater Technologies, and Digi-Key, not to mention companies like Medtronic and Honeywell that gave Minnesota its original early advantage in these technologies.
- *Having the IT, engineering, and analytics talent needed to leverage these technologies in a variety of industry contexts,* whether in health care, manufacturing, or business services – although more talented workers will clearly be needed in this fast-growing area in the next decade.

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- *Hosting several prominent national conferences and meetup groups, such as IoTFuse and MinneAnalytics connecting practitioners, fostering collaboration, and promoting Minnesota’s strengths in this space.*

Despite all this, Minnesota’s IoT advantages remain a hidden strength. Competing and succeeding in the future technology economy will require that Minnesota find additional ways to connect and activate these strengths for growth.

The Internet-of-Things is only one example. Similar advantages can be found in numerous categories. Minnesota’s deep knowledge in specialized areas like food science and agriculture, health care, education, and financial services makes Minnesota a prime location for startups and existing firms creating technology solutions for a range of industries.

Minnesota already has traction in areas like Edtech, Fintech, digital health, cybersecurity and more. Venture capital and startup resources are on the rise, and these fast-forming digital transformations are largely to credit. In fact, Minnesota raised more in venture capital over the past five years than in the whole preceding decade, setting a state high of \$908 million raised in 2019.

Exhibit 59. Minnesota’s Competitive Advantages in the Tech Economy

	Fintech	EdTech	Digital Health
Global Market Size and Forecast	\$305 Billion by 2025 (20% CAGR)	\$285 Billion by 2027 (18.1% CAGR)	\$386 Billion by 2025 (24.6% CAGR)
Initiatives & Support Services	<ul style="list-style-type: none"> ❖ Twin Cities Startup Week (BetaMN) ❖ Minnesota Fintech Collective (GreaterMSP) ❖ UMN Fintech Bootcamp ❖ gener8tor OnRamp Insurance Accelerator 	<ul style="list-style-type: none"> ❖ EdNorth ❖ Twin Cities Startup Week (BetaMN) ❖ Education Technology Innovations (UMN) ❖ EdTech Team Minnesota Summit 	<ul style="list-style-type: none"> ❖ Medical Alley ❖ gBETA Medtech ❖ Mayo Clinic Business Accelerator ❖ UnitedHealth Accelerator powered by Techstars
Industry Leaders (HQ or major operation)	<ul style="list-style-type: none"> ❖ US Bancorp (HQ) ❖ Ameriprise Financial (HQ) ❖ Thrivent Financial (HQ) ❖ Securian Financial (HQ) ❖ Wells Fargo ❖ RBC Wealth 	<ul style="list-style-type: none"> ❖ University of Minnesota ❖ Edmentum (HQ) ❖ Pearson VUE ❖ Jostens (HQ) 	<ul style="list-style-type: none"> ❖ UnitedHealth Group/Optum (HQ) ❖ Mayo Clinic (HQ) ❖ Medtronic ❖ 3M (HQ) ❖ Boston Scientific ❖ Smiths Medical (HQ) ❖ Provation Medical (HQ)
Notable Startups & Fast growth firms	<ul style="list-style-type: none"> ❖ Sezzle ❖ Upsie ❖ Apruve ❖ ClickSWITCH ❖ Branch ❖ Total Expert 	<ul style="list-style-type: none"> ❖ Trinity 3 ❖ Flipgrid ❖ Extempore ❖ Connexeo ❖ Flyweel ❖ Kaleidoscope ❖ SayKid ❖ Homi 	<ul style="list-style-type: none"> ❖ Bind ❖ Carrot Health ❖ Grandpad ❖ NovuHealth ❖ Gravie ❖ Zipnosis ❖ Datica ❖ Revel

Exhibit 59. Minnesota’s Competitive Advantages in the Tech Economy

	Food and Ag Tech	Smart Retail and Supply Chain Tech	(Other Tech Strengths) IoT, Cybersecurity, Data Analytics, 3D Printing
Global Market Size and Forecast	Food Tech: \$250 Billion by 2022* Ag Tech: \$22 Billion by 2025	Smart Retail: \$58 Billion by 2025 Supply Chain Tech: \$37 Billion by 2027	Internet-of-Things (IoT): \$1,319 Billion by 2026 Cybersecurity: \$111 Billion by 2025 Data Analytics: \$512 Billion by 2026 3D Printing: \$52 Billion by 2026
Initiatives & Support Services	<ul style="list-style-type: none"> ❖ Techstars Farm-to-Fork Accelerator ❖ Grow North -- Food/Ag/Ideas Week ❖ Mbold ❖ AURI 	<ul style="list-style-type: none"> ❖ Target/Metro Retail Accelerator 	<ul style="list-style-type: none"> ❖ IoTFUZE ❖ Minneanalytics ❖ Enterprise Minnesota ❖ MN Cyber
Industry Leaders (HQ or major operation)	<ul style="list-style-type: none"> ❖ Cargill (HQ) ❖ General Mills (HQ) ❖ Hormel (HQ) ❖ Land O'Lakes (HQ) ❖ CHS (HQ) ❖ American Crystal Sugar (HQ) ❖ Rosen's Diversified (HQ) 	<ul style="list-style-type: none"> ❖ Best Buy (HQ) ❖ Target (HQ) ❖ SPS Commerce (HQ) ❖ Sleep Number (HQ) ❖ CH Robinson (HQ) ❖ UNFI (formerly SuperValu) 	<ul style="list-style-type: none"> ❖ Stratasys ❖ IBM ❖ Toro (HQ) ❖ Tennant (HQ) ❖ Code42 (HQ) ❖ Honeywell ❖ 3M (HQ)
Notable Tech Startups	<ul style="list-style-type: none"> ❖ Sentera ❖ Recombinetics ❖ Conservis ❖ AgVend ❖ Rowbot ❖ Foodsby 	<ul style="list-style-type: none"> ❖ When I Work ❖ Inspectorio ❖ Kidizen ❖ Basketful ❖ Proozy ❖ Otrafy 	<ul style="list-style-type: none"> ❖ Protolabs ❖ 75F ❖ NimbeLink ❖ Arctic Wolf ❖ Protocol 46 ❖ FRSecure ❖ phData

Capitalizing on technology opportunities

Achieving our full potential in this area will require building and strengthening Minnesota’s underlying capacity for high-tech growth:

- **First, Minnesota must increase the availability of tech talent**, including both core technical workers – such as software and web developers, data scientists, engineers, and so forth – and tech-equipped talent in diverse fields like nursing, manufacturing production, transportation, financial services, and others. The industrial revolution required that workers learn to use new tools and new machinery to make goods like textiles and food. Likewise, the digital revolution will require workers of all sorts to develop capabilities to use emerging technologies to produce familiar goods and services.
- **Second, Minnesota will require a more developed tech infrastructure** to enable connectivity and access to such technologies across the state. This means prioritizing high-speed broadband and other internet connectivity strategies.
- **Third, Minnesota should align its economic development strategies to build on industry strengths.** Minnesota needs to shine a brighter spotlight on its high-tech economy. Minnesota’s tech sector remains largely a hidden secret. The state needs to raise its profile to attract and retain tech talent – and to ensure Minnesota is a place where innovators want to be.

Minnesota's tech sector

- **Understand the trends in technology jobs and industries with recommendations for education and workforce development.**

Technology skills are and will continue to be in high demand, but projections suggest that Minnesota's future growth will be constrained by an inadequate supply of highly skilled tech talent. This would limit Minnesota's future economic growth. Further research should be conducted to make clear: a.) where Minnesota actually stands relative to tech talent; and, b.) what we need to do to improve and grow the supply of high-skilled tech talent to drive Minnesota's future growth.

Minnesota has strengths in multiple sectors across a range of tech activities. The key is to ensure Minnesota remains positioned to capture growth in areas fusing new technologies into traditional industries, while better growing the tech subsectors in which Minnesota ranks low – before we fall even further toward the bottom of the pack. Leading employers have shared that they already struggle to find enough tech talent in the state, often looking and hiring elsewhere to meet these growing demands. Our paradox of strengths and weaknesses warrants further investigation and a detailed plan outlining how Minnesota will remove the barriers that seem to stand in the way of achieving our full high-tech future.

- **Leverage existing industry strengths to lead in areas like Internet-of-Things (IoT), fin-tech, digital health, ed-tech, automation, cybersecurity and data analytics.**

Minnesota should undertake efforts to connect and activate Minnesota's advantages in areas such as IoT, FinTech, and Food and Ag Tech. While solid work is already underway, these remain somewhat hidden strengths in Minnesota's economy. Minnesota needs to shine a brighter spotlight on its tech strengths and make Minnesota a place to be for innovators in these fields. Minnesota should dig deeper to assess the state's market position, interview key companies, and develop action steps to build these strengths.

- **Adapt and transform technology education and workforce training to better prepare Minnesotans for a technology-driven future.**

As explored in the *Leverage Minnesotans* section, Minnesota needs to rethink how it gives people the skills to succeed in a changing economy. New technologies are creating disruptions across our economy and changing the type of tasks performed in the workplace. The implications are broad and will require the state to think creatively about the types training and educational programs best suited to this challenge. This includes aligning K-12 and higher ed offerings to evolving demand in the economy. But it also includes the wide array of entities involved in delivering targeted training to job seekers and existing workers, whether through earn-and-learn programs, certificate "boot camp" training programs, or other on-the-job training programs.

- **Build on recent programs to accelerate high tech startups.**

As noted, Minnesota has experienced some traction in supporting new startup and securing VC funding in recent years. This includes initiatives and programs such as Forge North, Hill Capital, Great North Labs, Techstars Farm to Fork, Lunar Startups, gener8tor, OnRamp Insurance Accelerator, gBETA Medtech, and many others. Startup support services are also branching out, including efforts to foster high-tech startup activity in Greater Minnesota, such as the state's Launch Minnesota program, the gBETA St Cloud accelerator, the Center for Innovation and Entrepreneurship in Mankato, and the Mayo Clinic Business Accelerator Program in Rochester. The full list of programs, funds, and initiatives is too long to list here, but many of these efforts have been created or launched in just the past five to ten years and are gaining momentum. This gives Minnesota a buildable base of support services needed to foster the high-tech businesses of the next decade. Maintaining this momentum amidst the challenges of COVID-19 and the resulting economic downturn is imperative, particularly given the uptick in new business filings since the middle of 2020. A next step would be to evaluate what additional resources may be needed to help successful startups scale and expand in Minnesota, once they make it past the initial stage.

Leverage Minnesotans

Minnesota's economy will require something critical this decade: more people.

There is no getting around this basic fact. Slowing population and labor force growth has been a primary constraint on Minnesota's economy the past two decades, and it is only projected to slow further in the 2020's. The state demographer projects Minnesota's labor force growth will hit historic lows of less than 0.1 percent a year from 2020-2025. That simply is not enough to fuel growth in the state's economy.

Minnesota is not alone, of course. Advanced economies around the globe are seeing historically low population growth due to declining birth rates. But Minnesota has a second factor slowing labor force growth: low net migration. If not for fairly robust international migration, Minnesota would have lost more people than it attracted beginning in 2000. Contrary to common perceptions, Minnesota's domestic migration has not always run in the red. Minnesota was a net gainer in domestic movers in the 1990's, drawing solid in-migration from other Midwest states to grow its population and workforce. After 2000, however, in-migration from neighboring states slowed, while losses to the sunbelt and coastal hubs accelerated.

This combination of factors puts increasing strain on Minnesota to find ways to add to its talent pool this decade. Even the significant job losses suffered during the COVID-19 pandemic didn't change the long-term need to grow Minnesota's labor force. The short-term priority is of course to restore the livelihoods of those displaced by the 2020 recession. The job losses of 2020 are real and cannot be brushed aside.

But even by February 2021, Minnesota's unemployment rate had already fallen to 4.3 percent, and the state's bi-annual Job Vacancy Survey showed many jobs going unfilled, even in the midst of elevated joblessness. No matter how you cut it, Minnesota needs to grow its workforce if we want to grow our economy this decade. And Minnesota doesn't just need more people in a generic sense. Minnesota's future workforce must be increasingly oriented around higher level cognitive, technological, and relational competencies.⁸² New technologies are creating disruptions across our economy and changing the nature and type of tasks performed in the workplace – whether in a software company, precision manufacturing plant, or hospital.

While K-12 and higher education institutions remain the primary means of workforce preparation, rapid changes in technology are increasing the need for life-long learning and skills training for workers across the occupational spectrum. This opens opportunities for Minnesota to think more broadly about who is involved in equipping individuals for meaningful careers and how skill development should take place.

Fundamentally, the state must address two big challenges:

- **First, Minnesota must beat its labor force growth projections and increase the number of available workers in the state.** Minnesota's underwhelming economic forecast for the next decade is driven heavily by its slow population and slow labor force growth. While the underlying forces behind these projections are outside of anyone's direct control (i.e., falling birth rates, an aging population), there are strategies that can help Minnesota beat this forecast and improve its economic growth potential.

Namely, Minnesota can work to:

- a. Improve talent attraction from other states;
- b. Retain its existing talent base (e.g., decreasing the loss of younger Minnesotans to other states);
- c. Embrace and increase international immigration; and,
- d. Ensuring no one is left on the economic sidelines.

Growth and improvement in this area would not only grow Minnesota's labor force and economy, but also create

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stronger local communities and deliver greater equity for populations that may have faced historical disadvantages in the labor market. The good news is Minnesota has existing infrastructure and core strengths to address these issues.

Progress would mean more workers, more growth, and improved economic outcomes for all Minnesotans.

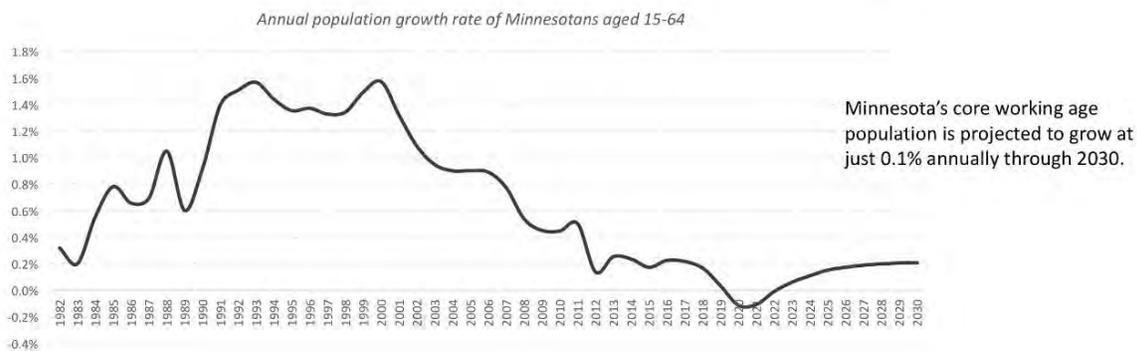
- ***Second, the state must rethink how it prepares young people for meaningful careers and how it helps adults develop new skills as jobs and professions are reshaped by changing technologies and markets.*** The days of performing the same job the same way for much of one's career are over. Jobs are changing quickly and new skills are often required. Technology is a key driver – and one that will likely only accelerate.

Minnesota can lead the way in rethinking how the public and private sectors work together to provide tools and teach the skills necessary for workers to continually learn and thrive in a changing economy. This means ensuring that all Minnesotans receive at least the basic education and skills they need to succeed in the workforce. But it will also mean aligning curriculum and training to the skills demanded in our 21st century economy, providing young people, parents, and adult workers with data-driven information on the opportunities and career paths that await them.

This is more critical than ever given the large-scale impact on workers from the COVID-19 pandemic and resulting downturn. But it likely only becomes more critical as the decade evolves.

K-12 and higher education will be more essential in the 21st century economy. Not every job requires an advanced degree. Skilled trades, for example, will be in especially high demand. But the jobs skill deficit facing those who don't finish high school only increases going forward, and that could make life-long learning of new skills even more difficult. Minnesotans must receive the skills and education they need to succeed in the workforce. Our higher education institutions also need to adapt and grow in response to the changing economy. It will be imperative.

Exhibit 60. Minnesota can beat labor force growth projections by increasing workforce participation and retaining/attracting talent.



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Leave no one on the economic sidelines.

- Labor force participation fell sharply in 2020 and is not projected to return to pre-COVID levels this decade.
- Younger and older adults and communities of color are underrepresented in the workforce. The state must ensure full engagement for all Minnesotans to grow its workforce.

How many workers could Minnesota add by 2025?
(estimates by Real Time Talent)

- Close racial/ethnic disparities = 65,000 more workers.
- Increase employment for older workers = 1,150 more workers.
- Increase youth employment = 15,200 more workers.

Retain and attract talent.

- Minnesota had 15 consecutive years of net domestic migration losses this century, driven primarily by:
 - Slowing in-migration from neighboring states, particularly near bordering counties.
 - Out-migration of adults 18-24 yrs old.
 - Out-migration to sunbelt and western regions.
- Yet, the state does better when narrowing the focus to high skilled talent, and is a net gainer of adults in their late 20's-30's. Minnesota is also a top state for dual income households.
- Minnesota must retain existing residents and leverage assets to attract top talent this decade.

Strategies to grow Minnesota's workforce, and give them the skills to succeed Beat labor force projections through increasing workforce participation and by retaining & attracting talent.

Minnesota cannot change the basic demographic factors driving slow population and labor force growth. However, the state does have an opportunity to improve its outlook by addressing its broken net migration formula and investing sustained attention toward bringing individuals into the workforce who may be on the economic sidelines.

Long-term improvements in these areas would not only grow Minnesota's economy, but also create stronger local communities and deliver greater equity to populations that have faced historical disadvantages in the labor market. The good news is that Minnesota has an existing infrastructure and core strengths to address these issues.

Strategies for increasing Minnesota's labor force growth fall under three broad categories:

- Improve net domestic migration.
- Maintain robust immigration levels.
- Increase labor force participation by targeting underrepresented groups and removing barriers to employment.

Improve net domestic migration

Minnesota's 15-year domestic migration slump is the result of a combination of factors:

- a. Accelerated losses to the Sunbelt.
- b. Slower in-migration from Midwestern neighbors, due especially to net losses along Minnesota's border.
- c. Out-migration of young people in the 18-24 age bracket.

At the same time, Minnesota possesses strengths relative to domestic migration that could potentially be leveraged. First, Minnesota is gaining more people than it is losing in the age cohort of 25-34. This suggests that the state has advantages for people looking to start or grow their family or career. These advantages seem to benefit rural communities in Greater Minnesota as well, suggesting a "brain gain" rather than "brain drain" of adults in their 30s and 40s.⁸³

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Second, while Minnesota has had overall net losses in domestic migration, the state does considerably better when narrowing the sample to high-skilled individuals.

Third, after 15 consecutive years of negative net domestic migration, Minnesota experienced *back-to-back net domestic migration gains in 2018 and 2019*. It is not clear whether this is the start of a new trend or a blip in the radar, but it points to an emerging opportunity for the 2020's to be a potential decade of attracting more people to Minnesota. Of course, 2020 was a reputational setback, and it remains too early to tell how COVID-19 will impact state-to-state migration patterns – but it is an optimistic factor to track going forward.

A *positive net migration strategy* certainly includes further investigation into the underlying causes of Minnesota's strengths and weaknesses relative to domestic migration, and development of an action plan to address these causal factors. This is an initiative in need of a home – supported by additional research from the State Demographer, DEED and others – with an action plan to follow from there.

Embrace and maintain robust immigration levels

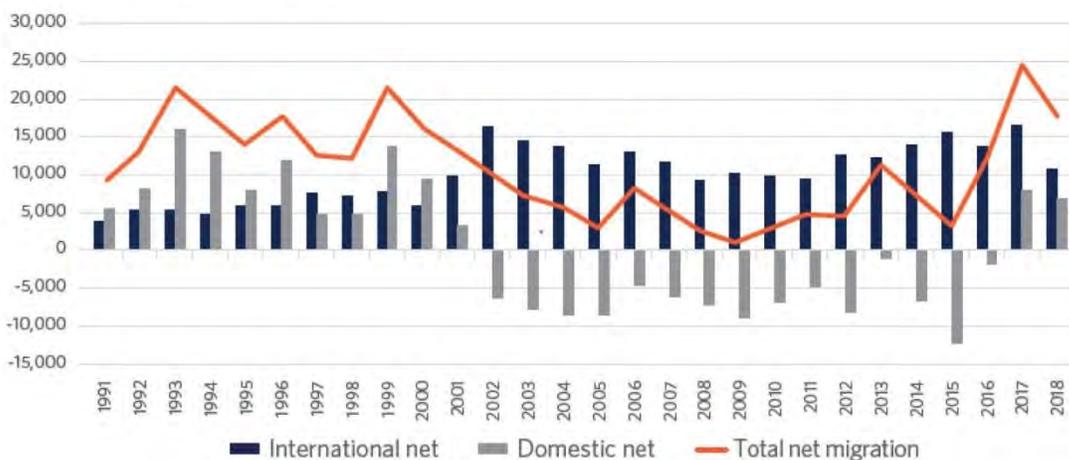
The second component to improving overall net migration and labor force growth involves embracing immigration – and maintaining Minnesota's advantages in attracting workers and families from around the world.

Through the first two decades of the 21st century, Minnesota relied entirely on international migration to keep from falling into the red for overall net migration. Positive in-migration contributed meaningfully to Minnesota's economy in the form of more workers, more entrepreneurs, more consumers, more tax payers, and a greater integration into the global economy.

In 2018, immigrants in Minnesota paid \$4.4 billion in taxes and contributed \$11.4 billion more as consumers in the state.⁸⁴ This helped spur economic activity in regions statewide, particularly benefiting Greater Minnesota communities with lower population growth.

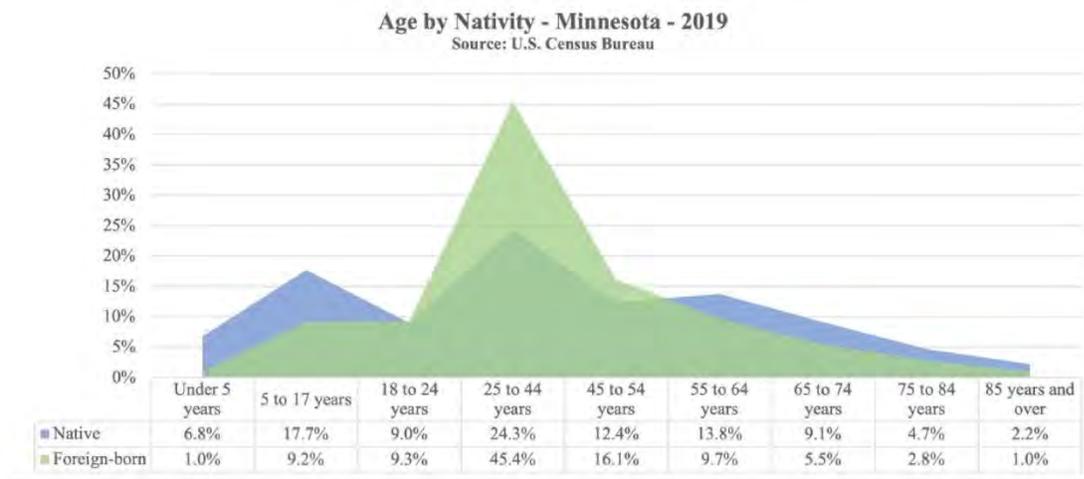
Exhibit 61. Minnesota would have lost more people than it attracted if not for immigration this century

Minnesota net migration by type: 1991-2018



Source: Minnesota Demographic Center

Exhibit 62. Minnesota’s foreign born population is concentrated in key workforce age brackets



Source: Minnesota Chamber of Commerce analysis of U.S. Census Bureau data

Minnesota has little influence on the “push” factors driving international migration, but the state can strengthen its “pull” factors to help international movers choose Minnesota as their new home to raise a family, get an education, find meaningful work, or start a business. The state has long benefited from a network of resettlement agencies, philanthropic entities, educational institutions, and business organizations that have supported immigrants as they start new lives in Minnesota. However, more can be done both to coordinate statewide immigration advocacy efforts and to help local communities attract and integrate international talent.

More should also be done to help businesses access the strength of the state’s immigrant workforce. Minnesota’s foreign-born population is disproportionately comprised of individuals 25-44 years old, a core age bracket for the state’s workforce. The state should accelerate initiatives to help businesses hire from these populations, while helping new Americans gain the skills, education, and resources needed to work at the top of their training levels. This could include efforts to recognize foreign educational and occupational credentials, provide language training tailored to on-the-job activities, increase participation in skills training, and better navigate career opportunities statewide.

Critically, this also means cultivating welcoming communities across the state that are inclusive and accepting of new Minnesotans of all backgrounds.

Note: For a discussion of the contributions and importance of immigrants in Minnesota’s economy, see the Foundation’s new report on immigration at www.mnchamber.com.

Issue spotlight: Retaining top international talent through H1B visas

Recruiting talent from outside of the state can be challenging. However, Minnesota has untapped talent pools in its own backyard that could be utilized to grow the state's workforce.

Take Minnesota's international student population. Each year Minnesota hosts between 6,000 to 7,000 international students at the state's colleges and universities. Nearly half those students are preparing for careers in technology related fields, and needed to have above average test scores just to be admitted.

Yet the state does a poor job of retaining this skilled talent pool that Minnesota itself educates, with a very high share of graduates leaving the state for jobs in other states or countries. This may be due in part to a lack of local job opportunities or low employer participation in H1B sponsorship. But talented graduates are an asset we can ill afford to lose.

Employers may be unaware of how to navigate the legal processes of sponsoring employees through the H1B visa program. In other cases, employers may be deterred by the cost or perceived retention risk of sponsoring an H1B worker.

What could Minnesota do to better leverage this talent retention opportunity?

- Minnesota could expand efforts to educate employers on how to sponsor and hire an H1B visa holder, and provide resources to lower the cost and retention risk.
- State colleges and universities could help expose international students to employers and jobs in regions in and outside the Twin Cities metro.
- Peer learning opportunities by successful companies could help reduce barriers for new sponsoring employers by sharing experiences and providing advice to businesses willing to explore H1B sponsorship and improve outcomes. Similar models have proven successful in areas such as veteran hiring and could be replicated.

Increase labor force participation among older adults and underrepresented groups

For years, Minnesota compensated for its low population and labor force growth with exceptionally high labor force participation rates. Minnesota routinely ranks among the top five states for its share of population 16 and over working or actively looking for work. In 2019, Minnesota's labor force participation rate was 70.1%, ranking 2nd highest in the U.S.

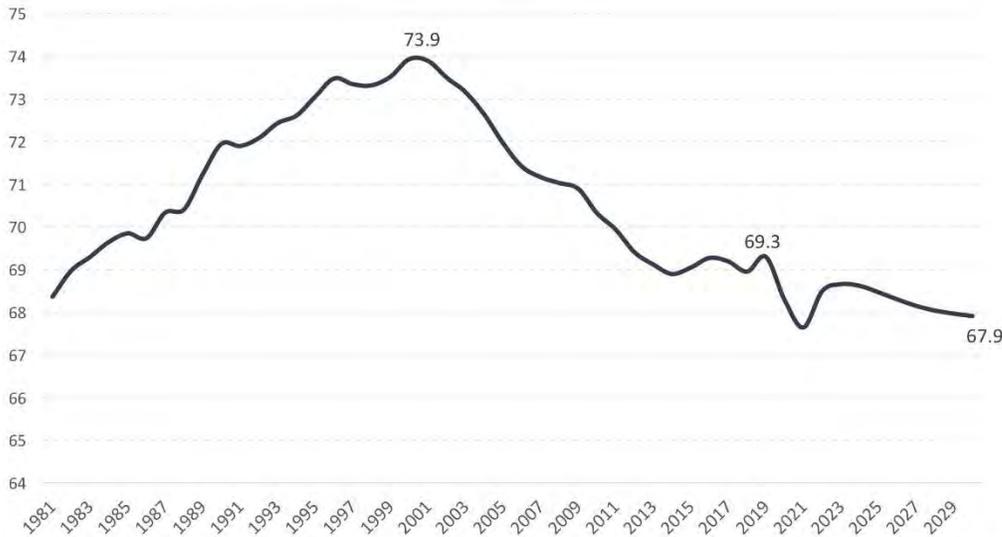
The high labor force participation rates are projected to decline over the next decade, however. This is driven primarily by Minnesota's aging demographics, with a smaller share of adults in their prime working age years. The state's significant racial and ethnic disparities also tend to produce lower labor force participation and higher unemployment rates among people of color.

Minnesota's regional economies – particularly in more rural areas – also face barriers to workforce participation related to insufficient housing, lack of child care, access to broadband, and access to transportation. On top of all this, the COVID-19 pandemic produced substantial drops in the state's labor force participation rate, with Minnesota's rate falling more than 2 points to 67.9 percent in November 2020.

Whether related to COVID concerns, government-mandated shutdowns, impacts on the hospitality industry, school closures and remote learning, or lack of child care, it is not entirely clear why Minnesota's labor force participation dropped as much as it did or whether that drop will endure post-pandemic. But it represents a significant threat. If Minnesota's labor force participation rate were to permanently shift lower, the factors slowing labor force growth in Minnesota would only be exacerbated – significantly impacting Minnesota's economy.

Exhibit 63. Minnesota’s labor force participation is projected to decline this decade

Annual labor force participation rate: Minnesota, 1980-2030 (forecasted)



Source: IHS Markit

Give Minnesotans the skills they need to succeed through education, training, and workforce alignment.

While much remains unknown about the pace and precise nature of changes likely to occur in the workforce over the next decade, a number of important assessments can be made.

1. Technology and health care jobs are projected to lead growth among all occupations.

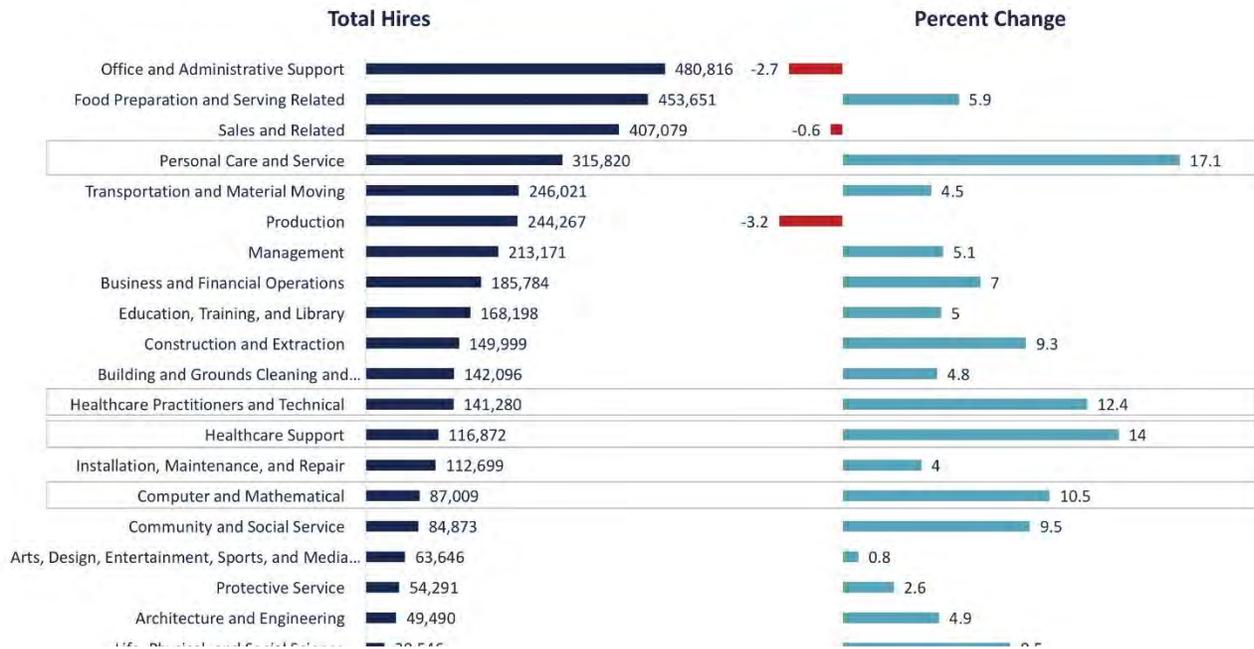
The Minnesota Department of Employment and Economic Development (DEED) projects that health care and technology jobs will outpace growth across all occupations between 2018 and 2028, with each of these occupational categories growing over 10 percent in that ten-year period.⁸⁵ Along with growth in computer and math occupations, management and business/financial operations occupations are poised to increase steadily, demonstrating the continued growth in Minnesota’s advanced service sectors. Other occupations such as construction and extraction occupations are projected to experience above-average growth over the decade as well. Even production jobs – which are projected to decline by 3.2 percent – will have hiring demand driven by labor exits in coming years. This will be important to address, as manufacturers already cite persistent challenges related to filling job openings, and growth in advanced manufacturing will require an increasingly skilled workforce even if production occupations decline overall.

2. The future of work will increasingly be oriented around higher cognitive, technological and relational/social-emotional skillsets.

Changes in technologies, automation, and business models may produce profound changes in the skillsets demanded in the workforce over the next decade. The massive disruptions of COVID-19 muddied the waters regarding the scale and nature of future change. But models from global consulting firms like McKinsey suggest that businesses will

Exhibit 64. Tech and health care occupations projected to grow fastest this decade

Minnesota DEED Occupational Forecast, 2018-2028



increasingly demand higher level cognitive, technological and social-emotional skills in coming years, as basic routine administrative and manual tasks are displaced through automation.⁸⁶

This will include rising demand for core technical workers, such as software and web developers, data scientists, and engineers. McKinsey estimates that “time spent using advanced technological skills will increase by 50 percent in the United States” over the next decade, with demand for advanced IT and programming skills growing as much as 90 percent by 2030.⁸⁷ These changes go beyond core technical workers. The need for tech-equipped talent in diverse fields such as nursing, manufacturing production, transportation, financial services, and others will also increase. McKinsey estimates that “among 25 skills we analyzed, basic digital skills are the second-fastest-growing category, increasing by 69 percent in the United States and by 65 percent in Europe.”⁸⁸ The implications run broadly. Consider the assessment from a report on future trends in the health care sector from Deloitte:

“Transformational technology investments and initiatives are coming from within and outside of health care. Advances in AI, automation, and analytics accelerate decision-making and ease or eliminate routine administrative tasks, enabling clinical employees to perform at the top of their license—focusing their time, attention, and effort on patients. (Deloitte, p 26)”⁸⁹

They go on to say, “While workforce-focused technologies are being introduced with increasing frequency, they may not attain their full clinical value if health system employees are not equipped to adopt and use technologies in the most efficient and effective way. Furthermore, clinical staff likely need to understand, and be able to convey to patients, the benefits that digital technologies can bring while being confident that the technology meets the requisite regulatory and data protection standards.”⁹⁰

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This example captures the changing imperatives for Minnesota’s workforce. Opportunities for businesses to realize the benefits of new technologies across industries will be dependent in part on the ability of their employees to effectively use these tools in day-to-day tasks. Minnesota’s educational and workforce training systems, including both public and private sector training mechanisms, must carefully assess how they can equip individuals to thrive in these changing circumstances. It is beyond the scope of this report to fully analyze expected changes in skills and occupations this decade, but we offer principles below and plan to continue to assess opportunities to better forecast and respond to such changes.

3. Basic educational completion is critical to succeeding in the workforce, but many jobs require a 2-year degree or less.

Wages are clearly linked to education levels. That data are clear. However, this fact too often obscures the concurrent reality that many middle wage jobs – and even some high wage jobs – require only a two-year degree or less. As the DEED occupational forecast shows, jobs in transportation, construction, and installation/maintenance are all projected to grow this decade. Minnesota’s ability to prepare and place individuals in these well-paying jobs is an opportunity to increase economic outcomes for job seekers and those seeking higher paying jobs.

How can Minnesota respond to these challenges and opportunities? Again, this report seeks only to identify guiding principles as an input to further planning on this topic. However, three basic strategic responses outline the challenges the lie ahead:

Exhibit 65. Is educational attainment the only indicator of skill and ability to work in highly productive jobs?

Selected occupations requiring less than a 2-year degree for typical entry level positions

Occupation Title	Education Requirements for Job Openings		
	No Formal Educational Requirement	High School	Vocational Training
Computer, Automated Teller, and Office Machine Repairers	1%	7%	91%
Farm Equipment Mechanics and Service Technicians	2%	15%	80%
Dental Assistants	1%	5%	77%
Electricians	1%	7%	76%
Emergency Medical Technicians and Paramedics	1%	15%	75%
Machinists	3%	19%	63%
Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	2%	13%	57%
Industrial Machinery Mechanics	5%	31%	56%
Welders, Cutters, Solderers, and Brazers	11%	36%	50%
Plumbers, Pipefitters, and Steamfitters	20%	28%	49%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	8%	42%	49%

Source: Minnesota DEED, Educational Requirements for Occupations

Ensure all Minnesotans receive at least the basic education and training needed to succeed.

First, Minnesota must meet the economic imperative this decade of ensuring that all Minnesotans receive the basic education and training needed to sustain meaningful employment. While the state ranks high in the share of adults with at least a 2-year degree, too many individuals continue to fall through the cracks and are left unprepared for the workplace. This includes not just those without a high school diploma, but also, potentially, the roughly one-fifth of Minnesotans over 25 with some college but no degree. Adequately targeting resources and career-specific training to these individuals is critical to reaching Minnesota’s fullest economic potential and simultaneously improving economic outcomes for all Minnesotans, ensuring businesses have the talent they need to thrive.

Exhibit 66. Roughly six to ten percent of the adult population (25 years and over) in each region has less than a high school education

Educational Attainment, 25 years and over

	Less than 9th grade	9th to 12th grade, no diploma	High school graduate (includes equivalency)	Some college, no degree	Associate's degree	Bachelor's degree	Graduate or professional degree	Percent bachelor degree or higher
Central Initiative Foundation	2.57%	5.04%	31.87%	24.75%	12.70%	16.29%	6.78%	23.0
Northland Foundation	1.55%	4.87%	30.62%	24.74%	12.20%	17.63%	8.39%	26.0
Northwest MN Foundation	3.01%	5.97%	33.23%	23.35%	11.84%	15.81%	6.79%	22.6
Southern MN Initiative Foundation	3.13%	4.47%	30.33%	21.76%	12.17%	18.25%	9.89%	28.1
Southwest Initiative Foundation	4.97%	5.57%	34.42%	22.73%	12.89%	14.15%	5.28%	19.4
West Central Initiative	2.49%	4.32%	29.45%	22.19%	15.14%	18.85%	7.56%	26.4
7-County Twin Cities	3.14%	3.61%	20.46%	20.01%	9.89%	27.84%	15.05%	42.9

Source: IHS Markit compilation of US Census

Source: IHS Markit

Invest in skills, not just degrees, through upskilling and alignment

Minnesota needs to think broadly about how individuals are trained for meaningful careers and who provides that training.

Employers increasingly prioritize high-demand skillsets over educational credentials alone. Many high-value jobs require only a 2-year degree or less, and many heavily utilize on-the-job training or other earn-and-learn programs. Even certain high wage jobs, such as software and web developers, offer opportunities for individuals to develop skillsets outside of traditional avenues.

The Minnesota Chamber Foundation’s Center for Workforce Solutions recognizes the need to better prepare young people and working adults for the skillsets and jobs in greatest demand in their communities. Foundation Business Education Networks further foster collaboration between key community stakeholders (e.g., schools, students, parents, local businesses, local chambers, etc.) to ensure that curricula and training are aligned with the jobs being created in their communities. It is only one of many programs and initiatives responding this challenge. However, the state’s ability to execute well on such strategies will be critical to positioning the state for long term growth.

Prepare for an increasingly high-tech workforce:

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Minnesota must also rise to the challenge of equipping Minnesota's existing and future workers to adapt to rapid technological changes. This includes assessing the capacity of higher education and workforce development institutions to train a greater number of core technical workers, as well as training individuals across fields in key areas, such as STEM, basic digital skills, advanced mechanical skills, etc. Technologies like AI, robotics, predictive analytics, and more will become more embedded in the day-to-day tasks of workers. This brings opportunity, but also risks to Minnesota's economy. Automation will displace workers in certain occupations across the occupational and skill spectrum. Other states or countries could gain competitive advantage by building workforce systems that are more responsive to the demands of a digital economy. The disruptions of COVID-19 only increase the urgency of developing statewide responses to these imperatives.

Issue Spotlight: Education

Minnesota touts its high-quality education system. But we also know it is not high quality for all. Compared to the rest of the world, we have work to do.

Minnesota K-12 education system is a topic that could fill entire reports – and has. Education is also essential for a growing economy, with strong educational outcomes attracting both talent and business investment.

Minnesota students are top performers on college entrance ACT scores, and rank 4th in the country for achieving two-year degrees or higher. But other rankings tell a different story. Minnesota's high school graduation rate is 34th in the country. Only 83 percent of Minnesota high school students graduate on time – a rate below the national average. That means *17 percent of Minnesota high schools do not graduate on time – and far too many do not graduate at all*. Minnesota's eighth grade reading scores rank just 20th in the country. That is eight spots lower than our previous ranking, according to the Minnesota Chamber's 2021 Business Benchmarks report.

For Minnesota to continue to have a high-quality, skilled workforce as the cornerstone of our economy, we must raise the achievement level of Minnesota students, ensuring every high school graduate is ready for postsecondary education or a career.

Data shows Minnesota continues to have a persistent and unacceptable achievement gap for students from disadvantaged backgrounds. Research by the Federal Reserve Bank of Minneapolis demonstrates that Minnesota continues to have some of the largest achievement gaps by race, ethnicity, and socioeconomic status in the nation – despite years of effort to improve.⁶⁶

Add pandemic to the mix – the impact and disruption of which has yet to be quantified or fully understood – and the long-term of educational outcomes for Minnesota children and young adults may not be what Minnesotans believe. It is expected that the suboptimal effects of extended distance learning will significantly impact student achievement, perhaps particularly for students without adequate access or from disadvantaged backgrounds. This is especially problematic in light of Minnesota's educational achievement gaps – already negatively impacting many of the same children. Those achievement gaps have persisted now for decades despite the implementation of policies and funding designed to close them. Other states and schools that have improved outcomes for minority and low-income students should be looked to for possible solutions, especially as we seek to recover from the COVID-19 pandemic as expeditiously as possible.

Minnesota's future economic success depends on ensuring all Minnesota students graduate high school prepared for the next phase of life – whether that be postsecondary education or beginning a career. This issue remains a priority for the Minnesota Chamber of Commerce and the Minnesota Chamber of Commerce Foundation. From early childhood education to post-secondary options, we believe that ensuring the best possible educational outcomes at all levels helps our economy and that the private sector should continue to be engaged in helping students and educational institutions understand the skills needed for high demand jobs today and tomorrow – helping create a better future.

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The good news is that promising initiatives are underway that offer promise in improving educational outcomes and addressing Minnesota's achievement gap. For example, New Vision Foundation in St. Paul – founded by Hussein Farah – is working to build a pipeline of diverse IT talent in Minnesota and inspiring students from immigrant and disadvantaged communities to join the tech sector. The foundation offered its first coding class in 2017 at Minneapolis Southwest High School, and today continues to expand coding classes to schools across the Twin Cities. It is now looking to expand in Greater Minnesota communities such as Willmar.

This is one of many exciting initiatives advancing opportunities to address Minnesota's workforce needs, while tackling disparities in education and employment outcomes.

Minnesota's economic future is in many ways dependent on how the state executes against this critical priority.

Strengthen communities

It's no longer enough for regions to have diverse employment and high-quality educational opportunities. Strong community assets and a culture that welcomes and embraces all will increasingly define successful growth communities by providing a competitive economic advantage.

Without reliable and affordable child care options or an affordable place to live, the availability of a great job or career opportunity may not be enough to allow a Minnesota family to thrive. Similarly, inadequate connectivity or inadequate community infrastructure is not a formula for thriving communities and economic growth.

Communities that lack high speed connectivity are at a competitive disadvantage in attracting business investment and residents. Their children may have fewer educational advantages and fewer growth opportunities, as demonstrated in the COVID-19 pandemic.

If we are to grow our work force and grow our economy, diversity and inclusion must also be welcomed and embraced. Communities and neighborhoods that develop inclusive cultures and strategies will attract and advance opportunities for people of color, including immigrants and refugees essential to the fabric of our culture and our future economic growth.

Strengthen community assets (housing, child care, connectivity)

Minnesota faces multiple economic imperatives this decade: increase net migration; increase workforce participation; foster innovation; unlock the potential of new technologies to fuel medical innovation; grow the state's existing strength industries, such as food and ag or manufacturing; and help regional economies grow their population and their labor force.

These priorities are all related. Each requires strong communities with 21st century infrastructures and an increased supply of necessary community assets, such as housing to attract new residents, child care to facilitate employment of parent-workers, fully-utilized digital access to technology, and the removal of barriers to economic growth.

In conversations with stakeholders statewide, three key issues surfaced again and again:

Child care

Minnesota's child care crises has been growing in intensity. In a recent survey, 62 percent of employers ranked affordable child care as a barrier to finding workers.⁶⁷ Early care and education program accessibility and affordability are dual education and workforce issues. Working parents need a safe, reliable place of learning and care for their children, enabling one or both parents to participate in the workforce. The children, who will eventually become our workforce, need quality early-learning opportunities, especially pre-K.

The ability of Minnesota employers to attract workers is clearly hindered by the growing statewide shortage of early child care and education opportunities. This shortage is already impeding economic growth in many communities across the state, and it will only continue to do so if this issue not addressed.

Both supply and demand solutions are necessary. Short-term solutions could include additional funding and support of child care providers, higher reimbursement rates, and greater investment in early learning scholarships. Incentives for employers may be another way to support quick and innovative ways for employers to help address child care issues within their company or their community.

The current child care model seems broken, and it's not clear Band-Aid solutions will hold it together. Longer-term analysis

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is required to address seeming deficiencies in the private-sector child care model, as well as the intersection of public programs and child care funding.

Developing innovative solutions to the issue of child care affordability and accessibility would provide Minnesota an incredible advantage in attracting and retaining workers across the state. Not doing so will restrict our economic growth.

Housing

One of Minnesota's key assets is affordability – believe it or not – especially compared to the east and west coasts. Housing cost is a critical aspect of affordability – and numerous reports, including the 2018 Minnesota Governor's Task Force on Housing demonstrate that Minnesota's housing market is not producing enough affordable housing for entry-level homeowners.⁹¹

According to the Task Force, Minnesota needs to enable the private sector to build 300,000 new homes over the next decade to stabilize prices in the market and keep up with demand.⁹²

A 2019 report by the Housing Affordability Institute, "Priced Out: The True Cost of Minnesota's Broken Housing Market," also found troubling results:

New homes in Minnesota now cost more than comparable homes in all other Midwest markets. For example, a comparable home in Hudson, Wisconsin, now costs \$47,000 less than the same home in the eastern Twin Cities.⁹³ And the Twin Cities has one of the highest gaps between new and existing home prices in the nation.⁹⁴

The disparity in homeownership rates between white and non-white Minnesotans is also the highest in the nation.⁹⁵ Up to one-third of a new home's price in the Twin Cities is due to regulations and policies imposed at the local, regional and state level.⁹⁶

New strategies and new partnerships are needed to address Minnesota's housing market. Fortunately, work has started with multiple examples around the state of policymakers, non-profits, community leaders, employers and builders coming together to spur new housing and help preserve the housing stock in local communities.

More needs to be done, however, to reduce the cost of building and spur construction of affordable housing. It is not just one factor pushing up the cost of housing. It is a multitude of factors. Policymakers at the state, regional and local level should undertake a rigorous cost/benefit analysis to assess and streamline the many regulations impacting housing costs, including permitting, zoning, and construction codes. In addition, policies to encourage and facilitate innovation in the housing market, enabling less expensive construction in building build and creating additional consumer choice - while still ensuring safety – should be pursued.

Connectivity

High-speed internet connectivity – like all other technologies – is developing quickly in ways that may prove more cost effective in delivering connectivity to underserved or rural areas. As access increases further into previously unserved and underserved areas, however, the "last mile" cost per connection will likely increase. Minnesota could take the lead on innovative solutions.

To accomplish this, exploration of wireless solutions and satellite technologies should be included to help determine whether these methods of connectivity can meet reliability and speed needs. Fixed wireless projects also underway should continue with a mix of local and federal funding. Further incentives by local governments, business partners and nonprofits may also be necessary to test deployment in different conditions around the state. Rapid analysis of the cost, broadband

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speeds, service reliability, and subscription rates should follow within 12 months of deployment. If shown to be as effective and reliable as traditional broadband at a similar or lower cost per connection, the state grant program should be modified to allow for embracing these wireless solutions.

The need for digital connectivity is only growing. It will be even more important to our healthy growing economy in the coming decade.

Available, affordable housing is already a critical need in many communities – and quality affordable child care is a need in almost every community. And despite continued progress on connectivity investment, many areas of the state remain underserved or without access.

Market and regulatory forces are clearly producing supply-side challenges in each of these key areas. These are not new issues, but they are increasingly pressing. Efforts are underway to address each of these needs. But challenges remain, and progress must accelerate if Minnesota is to achieve its full economic potential this decade.

The first-best solution is to reduce or remove barriers that prevent market mechanisms from addressing and providing an adequate supply of these key assets. Minnesota's regulatory costs are a clear constraint on building new housing. Stringent child care requirements also add costs that stress already thin or non-existent margins. The cost and benefit of existing and proposed regulations must be weighed, and policymakers should think creatively about how regulatory goals are achieved without strangling the supply of essential goods and services.

Even under the best circumstances, market forces outside of the state's control seem to be constricting supply. Thus, strategic intervention from both the public and private sector is needed.

Embrace all Minnesotans: Make inclusion a strength

The economic importance of embracing all Minnesotans and their ability to contribute is obvious. The economic and social justice imperative of addressing Minnesota's long-standing racial disparities is also painfully clear:

- Minnesota has among the worst racial disparities in the country, ranging from employment to housing, from health care to education, and from criminal justice to poverty.
- Communities of color represent the state's fastest growing demographic. People of color are Minnesota's future workforce, entrepreneurs, and consumers.
- Closing the achievement gap and addressing other disparities and is both a moral and economic imperative.
- It is also an economic growth strategy.

This was brought into sharper focus with the tragic death of George Floyd. Floyd's death and the unrest that followed demonstrated how far Minnesota has to go – challenging Minnesota's reputation nationally and around the world.

So much of the conversation has been focused around “closing the gap” between whites and communities of color on a range of social and economic indicators – but so little has been accomplished. While “closing the gap” is a necessary part of the solution, it suggests that our work would somehow be done if we can get two lines to converge on a graph.

Minnesota should rethink the imperative – and the opportunity.

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The big idea is to embrace all Minnesotans – and make inclusion a strength.

If Minnesota could be that place – if we could become the state that really does embrace and value the contributions of all – our economy would grow. If inclusion became a strength – instead of a weakness – Minnesota’s economy could grow and thrive like no other.

Are we close to achieving that ideal? No. Far from it – as the data indicates.

But in making Minnesota a state where people of all backgrounds can thrive, including people from diverse backgrounds around the world, we could overcome many of our most significant challenges.

It would mean increasing opportunities for the state’s communities of color, which would boost our economy. It would mean recruiting and welcoming diverse talent from across the U.S. and internationally, adding richly to our workforce. Immigration has been a Minnesota strength; we can leverage it in this quest.

This would be a mindset change to overcome deeply rooted social challenges involving every segment of society. But Minnesota’s innovative business sector is a powerful asset to drive that change. Achieving such a goal would require a dynamic, growing economy that provides people of all backgrounds with the tools and opportunities to pursue meaningful careers or start new businesses. But it would also create and fuel that same dynamic, growing economy simultaneously.

Economic opportunity is the cornerstone of such a strategy. And it can only be done through the sustained commitment and innovation of both Minnesota’s private and public sectors.

Fortunately, there are successful models in effect, with companies already making significant investments in new efforts. At the time of this report, dozens of companies and organizations have launched significant initiatives to accelerate change and invest in Minnesota’s diverse talent pool. Here is a sampling of how Minnesota companies are changing strategic initiatives to increase diversity within their companies and investing in racial equity in Minnesota:

- Best Buy is aiming to reach 30,000 teens annually from disinvested communities across the nation, including building a network of at least 100 Best Buy Teen Tech Centers to “teach skills and build a talent pipeline for a modern economy.” The company will have a particular focus on teens in the Twin Cities with special scholarship programs and is pledging \$44 million to invest in these and other opportunities to expand college prep and career opportunities for black, indigenous and people of color (BIPOC) students.⁵⁷
- Target announced in 2020 its plans to increase its representation of Black employees by 20 percent over three years, pledging \$10 million to advance social justice.⁹⁸
- In 2019, WSB launched “Opportunity+,” a program giving participants from diverse backgrounds practical skills in the basics of engineering. A cohort for whom tech schools were too expensive or who may otherwise work during the day, received 200 hours of training from WSB staff. They learned about concrete and soil, measuring and surveying, engineering basics, and work readiness.⁹⁹
- A group of private sector leaders including Andersen Corporate Foundation, Securian Financial, U.S. Bank, and Xcel Energy came together in September 2020 to fund a new community ‘learning pods’ initiative to tackle racial equity and achievement gap in the Twin Cities. The initiative – operated by the North Star Network in North Minneapolis – will provide tutoring, enrichment activities, and online learning assistance as students navigate the disruptions of COVID-19.¹⁰⁰
- US Bank is aiming its efforts directly at increasing economic and racial equity in small businesses, housing, and

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workforce development. They announced in 2020 a new \$15 million grant fund to support these activities. US Bank also placed additional goals around supplier diversity and lending to minority owned businesses, committing \$100 million annually in additional capital to African American owned and led businesses or organizations.¹⁰¹

This represents only a small sample of recent initiatives by Minnesota companies. Dozens of other efforts are taking shape across the state to change the landscape for communities of color. For example, the Metropolitan Economic Development Association (MEDA) is in its third year of the Million Dollar Challenge for Entrepreneurs of Color, a Shark Tank style pitch competition for BIPOC startups. The competition has already awarded \$1 million to three winners and generated substantial attention for participating businesses.

Or consider the partnership between IT services firm Atomic Data and employment training non-profit Summit Academy. Together, they are already providing training to individuals from communities of color to work in the IT field. While just one-year old, the program has trained fifty individuals reporting remarkable success from graduates.¹⁰² The Minnesota Chamber of Commerce itself has assembled a series of strategies to help businesses develop their own diversity and inclusion efforts, and has piloted strategies targeting supply chain and sustainability resources to businesses owned by people of color. The list goes on.

Minnesota should treat these various initiatives as laboratories of social and economic innovation – testing, replicating, and scaling successful programs wherever they may occur. Minnesota can promote what is working as recruiting tools for diverse talent from around the globe.

But rather than covering up Minnesota's unacceptable disparities, the state must directly address them – and correct them. We must embrace inclusion both on a social justice and social equity basis, but also as an economic strategy.

Meaningful change requires transparency and accountability. It requires that we change and that policies and practices change. But it is a big idea. Because embracing all Minnesotans and making inclusion a strength could forever change Minnesota's future for the better.

Conclusion

Minnesota: 2030 is the first major economic research project of the Minnesota Chamber Foundation. Ambitiously addressing the state's entire economic landscape with a 2030 outlook – developed in the midst of one of the most significant public health and economic disruptions in our nation's history was – Minnesota: 2030 advances three strategies and more than 50 recommendations and actions to support and grow Minnesota's economy to its fullest potential for the benefit of all Minnesotans.

Our thorough analysis of the structure of Minnesota's economy notes both its projected performance and identifies the strengths and constraints underlying that economic projection.

Importantly, Minnesota: 2030 also outlines a strategic plan and a more progressive path to strategically build and support a higher-growth, higher output, more rewarding statewide economy for the future.

We are prioritizing next steps and will lead on key objectives and recommendations appropriately within the scope of the Minnesota Chamber Foundation. We will also encourage necessary research of key parameters and will advocate to accelerate important foundational elements underlying our recommendations. We will partner where possible on projects and will follow the lead of others more appropriately advancing and strengthening key strategies.

As always, we continue to welcome input and embrace suggestions for improvement from Minnesotans in every region of the state – and we look forward to building an even better and stronger action plan to build a better economy together in the future.

Minnesota has many assets. We have a strong base from which to build and a strong tradition on which to build it. Minnesota's business community is like no other, and we plan to make it better and stronger in the future than it is today. Together, we will work to build our strengths; to attract and prepare more workers; to address barriers to work and to strengthen communities across the state.

Finally, we will work to make inclusion a strength.

We remain grateful for the support of our sponsors, our economic advisers and consultants – and the incredible business, academic, foundation and community leaders who join us in this effort.

We're ready to get to work – making Minnesota: 2030 all that we can be.

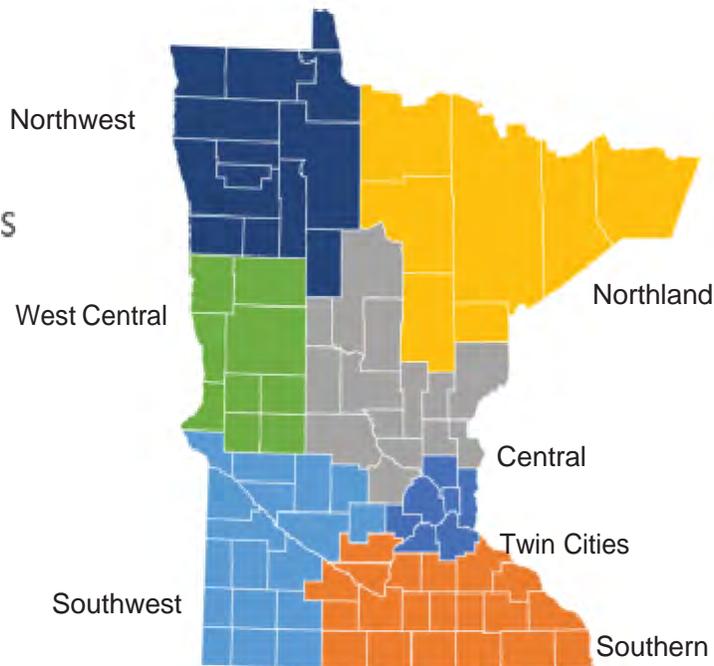
Appendix

Minnesota Initiative Foundation Regions

Initiative Foundation (Central)	Northland Foundation	Northwest MN Foundation	Southern MN Initiative Foundation	Southwest Initiative Foundation	West Central Initiative	7-County Twin Cities
Benton	Aitkin	Beltrami	Blue Earth	Big Stone	Becker	Anoka
Cass	Carlton	Clearwater	Brown	Chippewa	Clay	Carver
Chisago	Cook	Hubbard	Dodge	Cottonwood	Douglas	Dakota
Crow Wing	Itasca	Kittson	Faribault	Jackson	Grant	Hennepin
Isanti	Koochiching	Lake of the Woods	Fillmore	Kandiyohi	Otter Tail	Ramsey
Kanabec	Lake	Mahomen	Freemore	Lac qui Parle	Pope	Scott
Mille Lacs	St. Louis	Marshall	Goodhue	Lincoln	Stevens	Washington
Morrison		Norman	Houston	Lyon	Traverse	
Pine		Pennington	Le Sueur	McLeod	Wilkin	
Sherburne		Polk	Martin	Meeker		
Stearns		Red Lake	Mower	Murray		
Todd		Roseau	Nicollet	Nobles		
Wadena			Olmsted	Pipestone		
Wright			Rice	Redwood		
			Sibley	Renville		
			Steele	Rock		
			Wabasha	Swift		
			Waseca	Yellow Medicine		
			Watonwan			
			Winona			

Source: Minnesota Initiative Foundation; <<https://www.greatermnnesota.net>>

Minnesota's Regions



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Northeast Minnesota

Industry	Total Employment	Location Quotient	Employment CAGR 2014 to 2019	Quartile of forecast of real output growth in in US from 2018 to 2028. (1 is the lowest quartile, 4 is the highest)
Metal Ore Mining	4,063	96.73	-2.7%	3
Pulp, Paper & Paperboard Mills	1,866	19.30	-4.1%	1
Rail Transportation	1,778	9.03	-4.5%	3
Other. Residential Care Fac.	746	5.93	+4.3%	3
Res. Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	3,670	4.89	-1.6%	4
Power Generation & Supply	1,285	3.18	-0.7%	1
Civic & Social Organizations	819	2.72	-0.3%	3
Community Care Fac. For the Elderly	2,630	2.72	-1.5%	4
Drinking Places	1,022	2.51	+1.1%	3
Vocational Rehabilitation Services	839	2.44	-3.3%	1
Offices of Physicians	6,266	2.37	+5.1%	3
Retail - Gasoline Stations	1,997	2.09	-1.1%	1
General Medical & Surgical Hospitals	8,576	1.79	+0.9%	3
Aerospace Product & Parts Mfg.	960	1.64	+11.3%	1
Other Ambulatory health Care Ser.	532	1.63	+1.6%	3

Northwest Minnesota

Industry	Total Employment	Location Quotient	Employment CAGR 2014 to 2019	US output forecast 2018 to 2028. (1 is the lowest quartile, 4 is the highest)
Other Transportation Eq. Mfg.	998	119.87	-2.3%	1
Other Wood Manufacturing	2,732	21.73	-3.8%	4
Sugar & Products Manufacturing	769	16.44	+0.9%	4
Wholesale - Electrical Goods	3,160	14.62	+3.2%	3
Wholesale - Farm Products	312	8.79	+3.5%	2
Crop Production	6,183	8.49	+0.7%	2
Fruit & Vegetable Preserving	595	6.30	+3.6%	3
Rail Transportation	497	4.92	-2.2%	3
HVAC & Commercial Refrig. Equipment	345	4.84	-5.7%	2
Vocational Rehabilitation Services	553	3.13	-5.3%	1
Civic & Social Organizations	461	2.99	-4.0%	3
Support Activities - Crop Prod.	742	2.93	-11.3%	1
Motor Vehicle Mfg.	328	2.76	0.8%	1
Retail - Gasoline Stations	1,246	2.54	-0.8%	1
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	934	2.43	-1.4%	4

West Central

Cluster	Total Employment	Location Quotient	Employment CAGR 2014 to 2019	US output forecast 2018 to 2028. (1 is the lowest quartile, 4 is the highest)
Other Machinery Mfg.	2,432	13.14	+5.2%	2
Wholesale - Farm Products	570	12.34	+0.5%	2
Forging & Stamping	833	10.77	-3.0%	2
Sugar & Products Manufacturing	612	10.05	-3.3%	4
Animal Food Manufacturing	413	9.57	+15.7%	4
Crop Production	7,403	7.81	+1.2%	2
Boiler, Tank & Container Mfg.	417	6.75	-1.8%	2
Wholesale - Paper & Paper Products	575	6.44	+0.2%	2
Other Food Manufacturing	691	4.74	-3.6%	4
Res. Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	1,999	3.99	+1.7%	4
Retail - Beer, Wine & Liquor Stores	429	3.71	+0.9%	3
Highway, Street, and Bridge Construction	750	3.70	+11.6%	4
Machine Shops Mfg.	906	3.62	-1.8%	1
Animal Slaughtering & Processing	1,164	3.13	+3.0%	3
Community Food & Housing. & Emer. Ser.	403	2.75	+6.4%	4

Central Minnesota

Industry	Total Employment	Location Quotient	Employment CAGR 2014 to 2019	Quartile of forecast of real output growth in in US from 2018 to 2028. 1 is the lowest quartile, 4 is the highest
Household & Institutional Furniture Mfg.	2,918	5.96	+1.7%	3
Psychiatric & Substance Abuse Hospitals	2,171	5.60	+11.7%	4
Machine Shops Mfg.	3,378	4.42	+2.4%	1
Motor Vehicle Body & Trailer Mfg.	1,260	4.04	+0.3%	2
Other Wood Manufacturing	1,877	3.76	+3.9%	4
Utility System Construction	4,213	3.65	+15.5%	4
Vocational Rehabilitation Services	2,308	3.29	0.0%	1
Forging & Stamping	734	3.11	+1.8%	2
Animal Production	8,979	3.06	+0.8%	2
Support Activities - Printing	2,703	3.02	-7.3%	1
Boiler, Tank & Container Mfg.	568	3.01	-5.0%	2
School and Employee Bus Transportation	1,240	2.98	+2.2%	2
Animal Slaughtering & Processing	3,302	2.91	+4.4%	3
Retail - Other Motor Vehicle Dealers	990	2.90	+2.0%	2
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	4,434	2.90	-0.5%	4
Crop Production	8,315	2.88	+0.7%	2

Twin Cities

Industry	Total Employment	Location Quotient	Employment CAGR 2014 to 2019	Quartile of forecast of real output growth in sector in US from 2018 to 2028
Electronic Instrument Mfg.	29,135	5.61	+1.9%	3
Medical Eq. & Supplies Mfg.	18,063	4.67	+0.2%	2
Monetary Authorities - Central Bank	1,077	4.63	+0.8%	4
Lessors of Nonfinancial. Intangible Assets	1,807	4.04	+0.4%	3
Audio & Video Eq. Mfg.	1,035	3.86	-5.8%	2
Support Activities - Printing	17,107	3.28	-1.4%	1
Educational Support Services	3,617	2.69	+12.0%	1
Advertising & Related Services	15,297	2.58	+2.7%	3
Management of Companies & Enterprises	73,450	2.56	+0.3%	2
School and Employee Bus Transportation	6,064	2.50	+6.9%	2
Wholesale - Professional & Comm. Equip.	19,031	2.38	+1.7%	2
Metalworking Machinery	4,506	2.11	-0.2%	2
Insurance Carriers	38,065	2.10	+3.9%	2
Newspaper, Pred. Book, & Database Pub.	7,575	2.00	-0.6%	1
Other Machinery Mfg.	6,446	1.96	-1.8%	2

Southwest

Cluster	Total Employment	Location Quotient	Employment CAGR 2014 to 2019	US real output growth rate quartile for sector, 2018 to 2028
Wholesale - Farm Products	1,297	19.41	-3.4%	2
Animal Slaughtering & Processing	6,719	12.49	1.6%	3
Ag., Construction, & Mining Machinery	2,871	12.44	1.7%	4
Animal Food Manufacturing	753	12.06	0.8%	4
Crop Production	12,944	9.44	1.0%	2
Converted Paper Products	2,358	9.17	0.0%	1
Grain & Oilseed Manufacturing	414	6.70	3.3%	3
Industrial Machinery Mfg.	614	5.22	-1.8%	2
Other Wood Manufacturing	1,130	4.77	1.0%	4
Sugar & Products Manufacturing	405	4.60	1.5%	4
Dairy Product Manufacturing	618	4.01	-2.2%	3
Support Activities - Crop Prod.	1,777	3.73	-3.4%	1
Res. Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	2,628	3.63	-2.9%	4
Other Heavy Construction	342	3.60	-0.7%	4
Household & Institutional Furniture Mfg.	812	3.50	-2.0%	3

Southern

Industry	Total Employment	Location Quotient	Employment CAGR 2014 to 2019	Quartile of forecast of real output growth in in US from 2018 to 2028. 1 is the lowest quartile, 4 is the highest
Footwear Manufacturing	529	13.36	+6.9%	1
Grain & Oilseed Manufacturing	1,933	12.21	+1.9%	3
Cutlery & Handtool Mfg.	855	8.75	0.0%	2
Vocational Rehabilitation Services	6,363	7.48	+2.0%	1
Dairy Product Manufacturing	2,864	7.26	+2.9%	3
Wholesale - Farm Products	1,036	6.06	+0.5%	2
Animal Slaughtering & Processing	7,266	5.28	+1.6%	3
HVAC & Commercial Refrig. Equipment	1,711	4.98	+8.9%	2
Office Furniture & Fixtures Mfg.	1,421	4.88	+6.9%	3
Support Activities - Printing	4,594	4.23	-3.4%	1
Crop Production	14,834	4.23	+1.2%	2
Fruit & Vegetable Preserving	1,894	4.16	-4.4%	3
Motor Vehicle Body & Trailer Mfg.	1,471	3.89	+4.4%	2
Other Misc. Mfg.	2,637	3.75	+3.4%	1
Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	6,732	3.63	+4.6%	4

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