



Autodesk Foundation  
Impact Brief Series:

# Future of Work

# What we've learned

## An Autodesk Foundation Impact Perspective

This impact brief is the first in a three-part series that examines Autodesk Foundation's work in three key issue areas over the course of our five-year history: [future of work](#), [low carbon innovation](#), and [resilient communities](#). In each brief, we define the problem we are tackling and articulate our approach to supporting solutions and evaluating impact.

This first brief seeks to clarify the challenges and opportunities that automation brings to the workforce and defines Autodesk Foundation's strategy for investing in this issue area. It also provides learnings and insights from our preliminary research and early investments in workforce development.

This brief is written with a diverse audience in mind. By openly sharing how we see the challenges and opportunities automation presents to workers, and by communicating our investment thesis and commitment to action, we hope to drive more collaboration to solve critical issues facing workers today.

*Autodesk Foundation supports the design and creation of innovative solutions to the world's most pressing social and environmental challenges. We believe in the power of technology to transform society in positive ways.*

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A woman with long blonde hair tied back is seen from behind, sitting at a desk with two computer monitors. The monitors display data charts and graphs. In the background, a large industrial robotic arm is visible, suggesting a factory or manufacturing environment. The scene is lit with warm, golden light, possibly from large windows. A teal-colored rectangular box is overlaid on the right side of the image, containing white text.

# Why Future of Work?

## Introduction

We started investigating the topic of automation and jobs in late 2017 with a fundamental hypothesis: Autodesk, as a global technology company creating automation tools across multiple industries, can deliver uniquely positive outcomes for workers by intentionally putting people and equity at the center of this transformation. We intend to share our journey navigating the Future of Work (FoW)—what we’ve learned, which questions remain unanswered, and how we can deliver future impact.

Today, Autodesk Foundation supports worker prosperity in the era of automation, in service of a more equitable future. We’re focused on the United States (US) in the near term but will expand our geographic scope in the future.

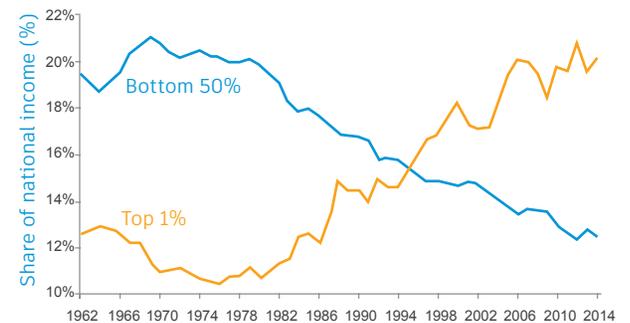
## What is the problem?

In the past decade, a growing chorus of concern has risen globally about automation technologies upending the workforce. Studies issued from Oxford University to McKinsey have suggested that anywhere from 20 to 50 percent of jobs in the US are susceptible to automation.

There’s little consensus on whether those numbers refer to jobs eliminated outright or to roles that will be augmented by machines, but one thing remains undisputed: automation is changing the nature of work. Certain tasks will become obsolete, some tasks will fundamentally change, and other tasks will emerge that we haven’t even envisioned yet.

In the US, the narrative of “robots are coming for your jobs” stokes a dangerous atmosphere of anxiety and apathy in an era where, especially for those without a college degree, job security and wage growth is a thing of the past. Income inequality in the US has been on the rise over the last 40 years, with the share of wealth disproportionately decreasing for the bottom half of earners.

Pre-tax income shares of the top 1% and bottom 50% in the US, 1962–2014



Source: Piketty, Saez and Zucman (2018). See [wir2018.wid.world/methodology.html](http://wir2018.wid.world/methodology.html) for data series and notes.

In 2014, 13% of national income was received by the bottom 50% in the US. Pre-tax national income is measured after the operation of pension and unemployment insurance systems (which cover the majority of cash transfers), but before direct income and wealth taxes.

At the same time, employers are reporting the highest talent shortages since 2007.<sup>1</sup> Employment growth is projected across sectors beyond high tech, including health care, construction, and certain manufacturing segments. Workers are still needed. While labor market participation is at historically low levels,<sup>2</sup> the economy is still adding jobs. Increasingly, these roles require skills that are technical, social, creative, and nonrepetitive—or some combination of the above.

1. Klaus Schwab, The Global Competitiveness Report 2017–2018, World Economic Forum, September 26, 2017, <https://www.weforum.org/reports/the-global-competitiveness-report-2017-2018>

2. Alex Richter, Tyler Atkinson and Laton Russell, “Changes in Labor Force Participation Help Explain Recent Job Gains,” February 19, 2019, <https://www.dallasfed.org/research/economics/2019/0219>

*The crux of the challenge lies in the mismatch between the needs of employers and the ability of the labor force to meet those dynamic and ever-evolving needs.*

## What is automation?

A recent Aspen Institute paper we commissioned called [Automation and the Changing Economy](#) defines automation as the following:

Automation generally refers to the use of technology to reduce the level of human activity needed to complete a particular task by replacing or augmenting labor.<sup>3</sup>

Key to this concept is that the task itself is still being performed, but with less human labor required to complete it. Because automation occurs at the task level, it often changes parts of a given job rather than eliminating an entire job, though in some cases technology can automate an entire job.

## The role of automation

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Automation, while not a direct cause of this problem, is exposing and potentially exacerbating pre-existing weaknesses in the economy and labor markets. The labor market is fundamentally shifting—rewarding higher cognition and technically savvy skills to a much greater degree. In essence, workers are being bifurcated between those who can navigate jobs in the era of automation and those who can't.

## Is reskilling the solution?

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At first, we—like many others—approached workforce development as a skills problem. If the skills needed to enable positive human-machine collaboration are different in the era of automation than they are today, then surely we can identify those specific skillsets and build pathways for workers of all backgrounds to acquire them. In following this line of inquiry, however, we quickly realized that efforts to better invest in worker skill development, even if done successfully, only begin to scratch the surface of what's needed to create a more equitable and prosperous future for workers. Reskilling efforts do not take into account the following:

### Mobility

Do these upskilled workers have mobility to move into other jobs?

### Human-centered

Do these jobs provide meaningful wages, personal identity, and a healthy working environment?

### Career navigation

Do students and workers have the information they need to navigate a changing job landscape?

### Market signaling

Are employers valuing the right skills and making hiring decisions accordingly?

3. Ethan Pollack, Alastair Fitzpayne & Conor McKay, Automation and a Changing Economy, Aspen Institute, April 2, 2019, <https://www.aspeninstitute.org/programs/future-of-work/automation/>

A close-up photograph of an industrial robotic arm performing a welding task. The robot is white and blue, with a welding torch at the end. Bright orange and yellow sparks are flying from the point of contact between the torch and a metal workpiece. The background shows a complex industrial structure with yellow metal beams and various cables, suggesting a factory or manufacturing plant environment. The lighting is a mix of cool blues and warm oranges from the sparks.

Our  
investment  
thesis

# Understanding the workforce ecosystem

To get ourselves to think about solutions beyond worker re/upskilling, we needed to better understand the workforce ecosystem. Autodesk Foundation partnered with the Monitor Institute by Deloitte to map the workforce ecosystem and develop a framework that helps to identify the main opportunity areas for philanthropic investment in a study called [Supporting worker success in the age of automation](#). Though our work with Deloitte centered on two industries (manufacturing and construction), the four opportunity areas that emerged for investment are applicable across industries:

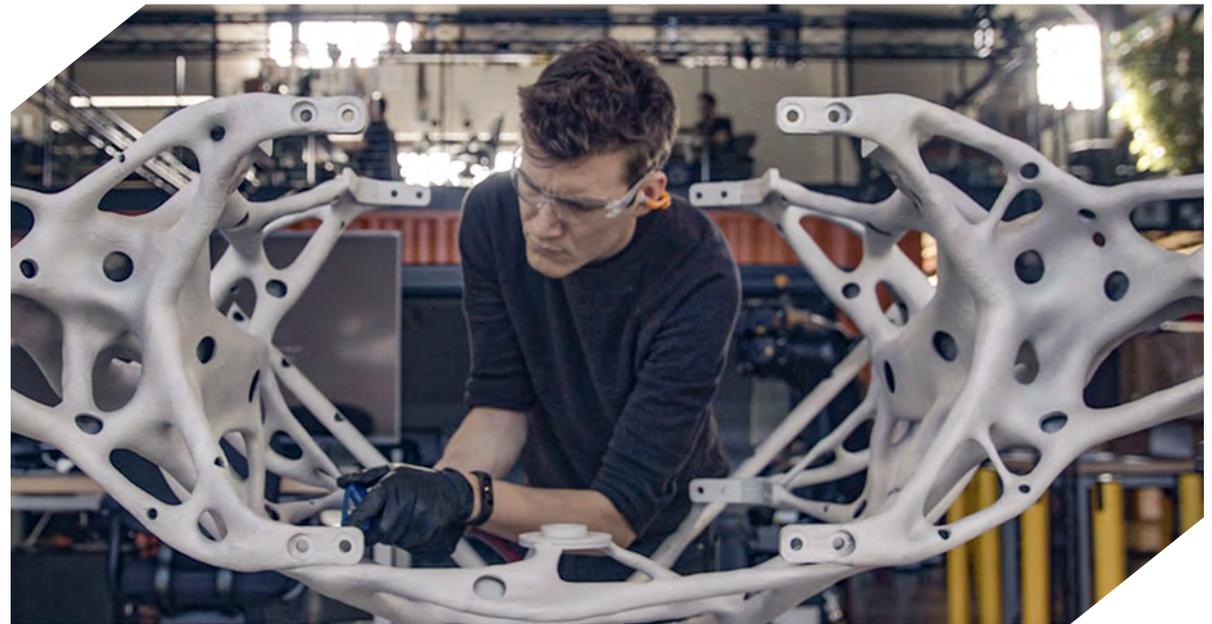
Opportunity area	Approach needed
 Address the needs of workers	Use technology to develop new education and training infrastructure to equip, upskill, and empower people to take control of their careers.
 Match workers to opportunities	Facilitate equitable, transparent, and efficient pathways for people to access education, job training, and economic opportunity.
 Influence the role of employers	Encourage employers to acknowledge and take responsibility for the critical role they play in a creating and maintaining a thriving workforce—including considering the role of labor as a value center, rather than a cost center.
 Evolve the ecosystem	Spur the enabling environment, which includes policy and advocacy around education, taxation, and a social safety net that supports people and communities amidst the accelerating change caused by automation.  Bring the public, private, and nonprofit sectors together to coordinate change.

*“In order to have worker-centered solutions, workers must have voice and power to influence and orient agendas, policies, and solutions. As such, we are supporting key worker organizations and infrastructure across sectors and geographies to increase their organizational power to effectively participate in multi-stakeholder processes and to increase their ability to innovate, experiment, and gain power, scale, resiliency, and sustainability.”*

– Ford Foundation Future of Worker Program

Clearly, the lack of advanced skills is not the sole barrier for workers to successfully navigate the future of work. We have to recognize the crucial role that multiple actors play in the system, including government, employers, and educators.

Many other organizations share our view that a multi-stakeholder, worker-centric approach is needed to address workforce transitions in the era of automation. There is a growing body of research to support this perspective, including from the [World Economic Forum](#),<sup>4</sup> [Council on Foreign Relations](#),<sup>5</sup> [Institute for the Future](#),<sup>6</sup> and Accenture,<sup>7</sup> to name a few. Government, philanthropy, and the private sector are each trying to tackle the challenge. Leading philanthropies such as [Ford Foundation](#) have doubled down on a worker-centered approach.<sup>8</sup>



4. World Economic Forum, “Preparing for the Future of Work,” accessed July 2019, <https://www.weforum.org/projects/future-of-work>

5. Edward Alden and Laura Taylor, The Work Ahead, Council on Foreign Relations, Updated April 2018, <https://www.cfr.org/report/the-work-ahead/report/>

6. Anna Davies, Devin Fidler, Marina Gorbis, Future Work Skills 2020, Institute for the Future, 2011, <http://www.iftf.org/futureworkskills/>

7. Accenture, “Envisioning New Career Pathways,” Inclusive Future of Work Podcast, Podcast audio, 2019, <https://www.accenture.com/us-en/company-inclusive-future-work>

8. Ford Foundation, “Future of Work(ers),” <https://www.fordfoundation.org/work/challenging-inequality/future-of-work-ers/>



## The role of corporate philanthropy

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We believe society must harness the power of automation to solve the most pressing design challenges of our time, like climate change and inequality, for a planet soon to be inhabited by 10 billion people.

We're techno-optimists: we believe that technology can be a powerful force for good. But we are not techno-determinists: we believe humans must have the agency and foresight to use technology as a tool for the betterment of society.

Doing so requires that people are at the center of any transformation. This is especially true with regards to workforce development in the era of automation, as it is people who will use these tools and decide how to deploy technology.

The corporate philanthropic community can and must take action that harnesses its unique position at the intersection of business and social impact.

In a recent op-ed with Aspen Institute's Future of Work Initiative, we examined why it's so critical to engage business in developing solutions:

*“Businesses play a central role in our ability to adjust to automation. They are at the center of technology adoption and have the resources and expertise to help workers adjust. We should encourage businesses to: invest in worker training, create partnerships with educational institutions and other businesses to develop career and skills pathways, apply a multi-stakeholder approach to automation decision making, and develop proactive strategies to manage workforce transitions.”*

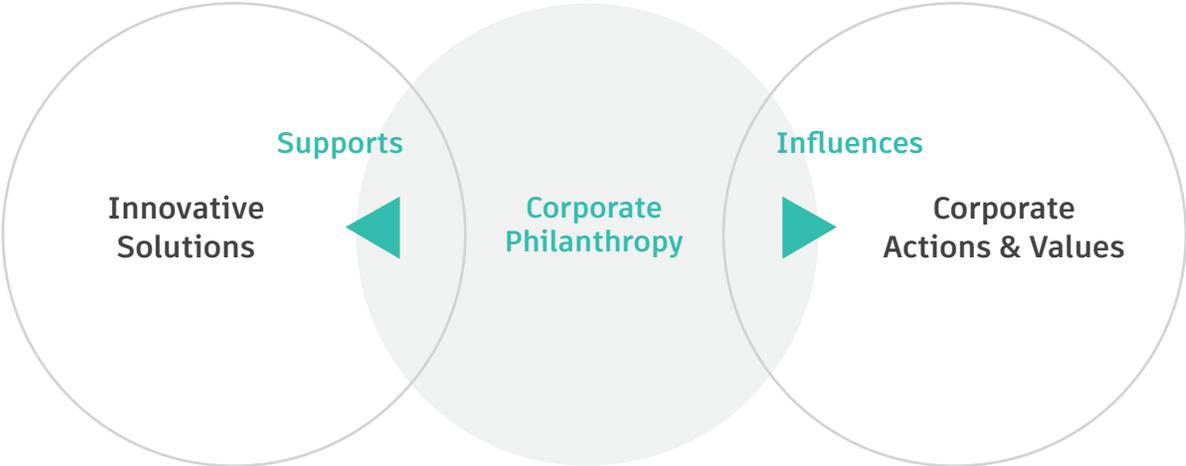
– Aspen Institute Future of Work Initiative

# Our dual role: A niche for corporate philanthropy

We are closely tied to but independent from Autodesk, Inc., an employer of 10 thousand workers and itself an automation company. As such, we have a dual role to play.

1. We can use our investment capital and resources to catalyze solutions being developed by companies that align with our workforce development priorities described above.
2. We can shape how Autodesk engages on this issue as an employer and technology company. We must keep in mind the dual objective of supporting solutions out in the world and working to change our own ways of working internally. This binary approach will help ensure that we stay accountable to the bigger picture of supporting worker prosperity.

In this dual role, we can use our bird's-eye view across sectors to influence our customers and to develop relevant partnerships to achieve shared goals.





Investing in  
solutions

## Our approach

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Historically, Autodesk Foundation has primarily supported entrepreneurship and innovation in early stage companies and organizations. We use flexible, risk-tolerant grants and impact investment vehicles to help bring transformative technologies to scale with a thesis-driven approach (in other words, not technology for technology's sake).

In tackling the challenges around FoW, we needed to expand beyond the early stage startup ecosystem in order to be more responsive to the changing workforce ecosystem. We initiated grants and partnerships that enhance our understanding of how to address the needs of workers, improve matching infrastructure, and engage employers in a targeted way. Our grantmaking has provided an opportunity to drive impact, but also to learn and iterate on our approach.

An overview of this process is described on the next page.



# Investment timeline

Stage	2017 Discovery	2018 Exploration	2018 Learning	2018 Continued investment
<p>We started investigating the topic of automation and work in late 2017.</p> <p>We have deployed \$2M in grants to seven organizations.</p> <p>We initially focused our efforts on supporting the ecosystem—organizations that support entrepreneurs and innovators through investment capital, mentorship, and connections.</p> <p>We funded two grants focused on research and learning.</p> <p>We felt funding research was necessary given the lack of specificity in existing literature on how to best align philanthropic activity in service of workers.</p> <p>While it's far too early to claim any impact additionality in our Future of Work portfolio, we are in the process of actively assessing worker outcomes across multiple impact dimensions, from both our catalytic capital and our hands-on approach to deploying Autodesk in-kind services. Much more work remains to quantify and qualify impact outcomes as we progress.</p> <p>Through 2019, we plan to continue to build our FoW portfolio with the deployment of an additional \$2M as impact investments and grants. 2019 will continue to focus on the US; however, we'll begin to engage our global portfolio and networks to think about how these learnings transfer globally.</p>				
<p>Explored startup landscape around workforce tech</p> <p>Explored startup landscape around workforce tech</p> <p>Thought leadership/academic backbone of tech and exposure to a global portfolio</p> <p>Understand the socio-economic underpinnings of the labor market through a policy lens</p> <p>Landscape the overall workforce challenge and develop solution frameworks</p> <p>Understand access to job opportunities through learning about workforce intermediaries</p> <p>Power and experience of a traditional work powerhouse with an innovation approach</p> <p>Continuing to refine our hypothesis through supporting more solutions</p>				
<p>Village Capital convened investors and startups in partnership with us for <a href="#">Automation and AI for Good Forum</a></p> <p>AiiM Partners formalized investment strategy on workforce outcomes with fund carve-out</p> <p>Supported the overall program and co-hosted the launch of the MIT Inclusive Innovation Challenge</p> <p>Two-part op-ed with Aspen Institute: <a href="#">Automation and a Changing Economy</a></p> <p>A report for internal and external purposes with Monitor Institute Deloitte: <a href="#">Supporting worker success in the age of automation</a></p> <p>Hope Street Group is promoting competency-based workforce outcomes through intermediaries</p> <p>JFFLabs is sparking innovation and entrepreneurship at Jobs for the Future (JFF), a leading workforce development nonprofit</p> <p><b>In the pipeline</b></p> <p>We are sourcing for solutions across sectors that address the challenges laid out in our framework. For 2019, we plan to increase our workforce portfolio and invest in both direct service orgs and intermediaries including <a href="#">ISAIC</a>, <a href="#">Village Capital</a>, <a href="#">Acumen America</a> and <a href="#">Zinc</a>.</p>				

## Workforce innovation questions

- To what degree do workforce technology startups need access to community colleges, workforce boards, regional workforce initiatives, and corporates to drive adoption and scale?
- What are the challenges in aligning skills supply and demand of this two-sided marketplace? What is and is not scalable?
- Where should workforce technology startups partner vs. compete with entrenched public workforce initiatives?
- Where can and should ecosystem enabling organizations (accelerators, incubators, and funds) deliver value in the work + learn technology ecosystem?



## Case study: JFFLabs

### Impact objective

#### Accelerate the deployment and adoption of new workforce technology innovations

Launched in February 2018, JFFLabs is the innovation subsidiary of Jobs for the Future (JFF), the well-respected workforce development non-profit that works to ensure that all low-income workers have the skills and credentials needed to succeed in the US economy.

Using the parent organization's deep networks across community colleges, workforce development boards, corporations, and political organizations, this "lab" subsidiary of JFF accelerates the adoption of new workforce technology innovations from the startup community.

JFFLabs runs an accelerator, an incubator, a corporate engagement platform, and an impact fund to catalyze technology innovation in a sector that has seen very little innovation over the past few decades.

### Investment rationale

Autodesk Foundation funded JFFLabs because of its targeted focus on positively impacting workers through entrepreneurship and innovation, its ability to connect its startups and employers (like Autodesk, Inc.) to valuable people and organizations in the workforce space, and its proven ability to be a willing and capable thought partner on workforce issues.

*Meeting the needs of the Future of Work will require a dual transformation approach—improving and evolving today's institutions and systems, while radically reimagining new approaches and business models. JFFLabs bridges the traditional systems and innovative approaches that will be critical to ensuring economic advancement for all.*

– JFFLabs

## Workforce intermediaries questions

- To what degree do technology and tools impact the effectiveness of workforce intermediaries?
- What lessons can be drawn from different industries and regions in tackling this issue?
- Does this approach materially change employer hiring practices for jobs at this skill level?



## Case study: Hope Street Group

### Impact objective

**Provide professionals with the knowledge and training necessary to effectively deploy solutions in their communities**

There is a fundamental problem with signaling and career navigation for many middle-skill job seekers in the US. Employers need certain skillsets for the jobs they have available. But many are using outdated metrics—such as number of years of experience and degrees—rather than taking an evidence-based look at the skills needed to be successful.

Hope Street Group, through its digital Skilling America platform, addresses this problem by empowering professionals to provide competency-based career pathway support to workers who are most at risk of job displacement by advancements in automation. By the end of 2020, Hope Street Group expects to train 25,000 workforce intermediaries through its strategic partnership with Goodwill on the Skilling America online platform, who in turn will reach 125,000 individual workers.

### Investment rationale

Autodesk Foundation funded Hope Street Group because of their unique focus on bringing training technology and personalized human support together to match vulnerable workers to quality jobs based on the right competencies.

*Workforce readiness is a matter of great societal importance. Meaningful work is critical to the well-being and mobility of individuals, families, and communities. Employers and workers alike need to adapt to successfully navigate the choppy waters ahead. The changing nature of the labor market, education, training, and technology are demanding it.*

– Hope Street Group



Way  
forward

## How we think about impact

	Opportunity area	Action	# Metric ▲Signal	Impact
	Address the needs of workers	Empower people to take control of their work and future	# of workers upskilled # increase in wages	People are valued as workers Communities thrive
	Match workers to opportunities	Provide access to education and training; create pathways to opportunity	▲ Transformation of workforce intermediary ecosystem ▲ Transformation of the credentialing ecosystem	Lower unemployment Fewer unfilled roles
	Influence the role of employers	Engage employers considering labor value center	# number of employers engaged ▲ Increased worker voice and representation as corporate stakeholders	Corporate culture is committed to worker success Proliferation of worker-owned business models
	Evolve the ecosystem	Support the enabling environment: public, private, and nonprofit sectors	# Cross-sector and industry-specific partnerships focused on solving workforce challenges	More coordinated action that creates better outcomes from education to workforce

## In conclusion

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Ensuring worker prosperity in the era of automation is one of the most important social issues of our time. Autodesk Foundation has a critical role to play as a philanthropic institution, and Autodesk, Inc. has a unique role to play as an employer and tool developer. As we continue forward with this work, we will hold ourselves accountable to the following set of guiding principles:

### Guiding principles

#### Utilize our place at the intersection of business and philanthropy

As a corporate philanthropy closely tied to Autodesk, Inc., we have unique insight into: 1) the role employers might play in facilitating a more equitable labor market; and 2) skills and competencies needed in specific industries, such as the construction and manufacturing sectors, as they adopt automation technologies.

#### Focus on people and equity

Access to education, networks, job opportunities, and advancement is intrinsically tied to wealth and social equity. Beyond just employment, workforce solutions must address helping low-income individuals climb out of poverty, as dignified, fairly-compensated work remains the most viable and sustainable way to stay out of poverty.

#### Embrace a systems approach

The labor market functions as a complex, interconnected system. One-off, siloed interventions run the risk of treating symptoms of the system's inefficiencies without correcting the system itself. Coordinated action is needed.

### Next steps

In the last five years, we have evolved our thinking on how to evaluate the impact of our portfolio. Rather than only considering impact at the end, we define the problem we are trying to solve at the outset of a partnership. This is essential to identifying right types of solutions and outcomes we want to catalyze in the world. Only when we have a clear understanding of the solutions and outcomes can we then measure the impact that matters.

Through our research and early grants, we have defined the future of work challenge as one of facilitating worker transitions within a fragmented ecosystem. Looking ahead, we expect to identify the right impact metrics that reflect the solutions to this challenge. We will continue to test different hypotheses, derive market-based intelligence, and iterate on our approach.

We will strive for cross-sector collaboration to push forward systemic change to drive toward a shared vision of impact.

We invite you to join us. Contact us at [info@autodesk.org](mailto:info@autodesk.org)



# Appendix



## Additional resources

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There is growing interest in FoW as a research and policy topic and an investment category. The body of knowledge on this topic is also expanding. We have included a selection of resources undertaken by Autodesk Foundation, our partners, and our portfolio below.

- Aspen Institute's [Automation and a Changing Economy](#)
- Hope Street Group's [Sync Our Signals Impact Report](#)
- Monitor by Deloitte and Autodesk Foundation's [Supporting Worker success in the age of automation](#)
- Village Capital's [Automation for Good](#)

## A note of thanks

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Thank you to several organizations who provided key insights and critical thinking that made this impact brief possible, including: Ford Foundation, Hope Street Group, Jobs for the Future Labs, Lumina Foundation, and Sorcero.