2023
PATHWAYS TO INCLUSION

Tech Equity in the District of Columbia

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WDCEP
WASHINGTON DC
ECONOMIC
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OFFICE OF THE DEPUTY MAYOR FOR
PLANNING & ECONOMIC DEVELOPMENT

GOVERNMENT OF THE
DISTRICT OF COLUMBIA
DC MURIEL BOWSER, MAYOR

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Dear District entrepreneurs and residents,

As Mayor of Washington DC, I am pleased to share with you the 2023 Pathways to Inclusion report.

My vision is for Washington, DC to become the global model for inclusive prosperity and resilience. A core pillar of this plan is to grow a thriving and equitable tech ecosystem—offering entrepreneurship, wealth-building, and employment opportunities to a broad array of residents.

Washington, DC has been ranked by CNBC as the third best place in America to start a business, and in the top five for diversity of entrepreneurs, while SmartAsset named Washington, DC the second best city for women in tech. To add to that, Technical.ly recently ranked DC the No. 3 metro area for tech employment and a top spot for technologists of color and diversity. While our tech ecosystem is strong and vibrant, it also faces challenges. Diverse entrepreneurs, talent, and people interested in growing in the tech ecosystem experience barriers to capital, opportunities, and mentorship. And these challenges are not equally distributed: we know that Black, Latino, women, LGBTQIA+, and people with disabilities all encounter greater barriers than others.

This is why we released the 2016 Pathways to Inclusion report and have continued to support and advocate for an equitable District tech ecosystem. This report builds upon work we have done since 2016 and assesses and expands on our progress. It is grounded in conversations and surveys of tech entrepreneurs and civic leaders across the District, as well as comprehensive and detailed data analysis of the District's tech ecosystem. This report is not just a survey of the current state of the tech ecosystem, but it is also a plan to ensure that the tech ecosystem is more equitable in the future.

Building on the many efforts that have preceded it, the report includes recommendations and best practices from across the country, grounded in our tech ecosystem's local needs and challenges. They are a collection of ambitious, yet realistic, strategies to close the tech ecosystem's equity gap.

I want to thank all of the stakeholders—entrepreneurs, technical assistance providers, and other community partners— who contributed their time to provide input into this study. Together, we can make Washington, DC the global model for a thriving and equitable tech ecosystem.

Sincerely,

Mayor Muriel Bowser

Dear Fellow Washingtonians,

On behalf of the DC Innovation & Technology Inclusion Council (ITIC), I am pleased and honored to endorse the 2023 Pathways to Inclusion report, which will act as a vision for helping Washington, DC continue growing its vibrant tech economy while setting a new standard for diversity and inclusion—both nationally and globally. I commend the leadership and determination of Mayor Bowser and her team who are working diligently to tackle the opportunities and challenges.

This report includes a detailed study of the tech ecosystem in DC specifically through the lens of diversity, equity, and inclusion. The findings show that DC has increasing access to venture capital and a growing number of jobs in the tech ecosystem with wages well above DC's median wage. But unfortunately, access to the tech ecosystem has not been equitable for all residents. This report is transparent about these findings while setting new benchmarks for success and offering action-oriented solutions.

The Pathways to Inclusion report serves as a framework for building an inclusive tech ecosystem by looking at talent development, career pathways, innovation and entrepreneurship, access to capital, and job creation. It shows that while there is much to be proud of, there is also more work to be done.

In the months ahead, we are confident that DC's broad and diverse community will come together to turn vision into action. The ITIC will have an important role to play in addressing the challenges and opportunities presented in this report. Together, with the Mayor and the public, we will ensure our city grows its innovation and tech economy in an inclusive way that provides jobs and access for capital to all residents.

Sincerely,

Thomas Sanchez
Chair, Innovation and Technology
Inclusion Council

DC Startup Week 2019. SOURCE: WDCEP

EXECUTIVE SUMMARY

The District of Columbia's (DC) tech ecosystem is a vibrant and rapidly growing part of its economy, with 1,200 tech firms and a robust and diverse workforce of 95,000 workers, uniquely anchored by the federal government as a tech employer, a consumer of technology, and a center for civic tech and innovation. DC's tech workforce is more diverse–by gender and race–than the nation's tech workforce. This study presents opportunities to build on this foundation and advance DC's goal of being an urban center that is a destination of choice for innovators and job creators who provide access to opportunity for all residents.

As shown to the right, DC's 95,000 tech ecosystem workers fall into three categories:

1. **Tech Occupations in Tech Industries**—Jobs at tech companies that require tech skills. For example, a front-end developer at EastBanc Technologies, a software development company based in DC.
2. **Non-Tech Occupations in Tech Industries**—Jobs that are not related to tech but are based in a tech company. For example, a human resources manager at FiscalNote, a DC-headquartered company that provides data gathering solutions for legislation analysis and assessments of government risk.
3. **Tech Occupations in Non-Tech Industries**—Jobs that require technical skills but are not located in a tech company. For example, a network security specialist at the U.S. Department of Agriculture.

A subset of tech in tech and tech in non-tech jobs is **high-tech jobs**, which directly create or manage digital products, systems and services. These jobs typically require highly technical skills, including knowledge of coding languages and network architecture, as well as a bachelor's degree or higher.

Due to available data, this report focuses on jobs and workers as the core metrics for growth and diversity in the tech ecosystem, supplemented by information on venture capital (VC) investment, broadband access, computer science (CS) education, the DC workforce budget, and other targeted metrics for which less comprehensive data is available.

DC's tech ecosystem is thriving. From 2012 to 2022, tech ecosystem jobs grew by 22%, adding 18,200 jobs, even as DC jobs overall increased by only 1%. The low overall increase was driven by the loss of service jobs during the pandemic. DC's tech ecosystem growth was almost double the 12% growth in the wider region (defined as the DC Metropolitan Statistical Area in this report) during that time

period. Unsurprisingly, the DC ecosystem is driven by the federal government: 37% of all tech workers in DC work in government, compared to 10% of tech workers nationwide. The DC tech ecosystem also offers valuable opportunities for economic mobility: its median wages are $112,700, compared to $90,000 in DC as a whole. DC's tech ecosystem is more diverse than the country's, and there are more Black, Latino, and women workers in the local tech ecosystem than in 2012. Nevertheless, Black, Latino, and women workers are underrepresented when compared to DC's workforce as a whole, indicating there is more work to be done to build on DC's efforts to increase diversity. (Note: see appendix for definitions.)

In 2016, the DC Office of the Deputy Mayor for Planning and Economic Development (DMPED) released the District's first-ever report on the state of inclusion in the city's tech economy: the 2016 Pathways to Inclusion report, which proposed 19 interventions to foster a more inclusive tech ecosystem.

This 2023 report by DMPED and the Washington DC Economic Partnership (WDCEP) seeks to provide an update by 1) documenting the progress that has been made and 2) identifying next steps for making the District a leader in diversity, equity and inclusion in tech. This includes capturing the current state and assets of DC's tech ecosystem; identifying key challenges to diversity, equity and inclusion; proposing opportunities and recommendations to address these challenges; and providing metrics for measurement of progress. This report relied on data analyses, a sentiment survey of tech professionals, and stakeholder engagement, including 18 interviews and focus groups with a total of 42 stakeholders–from employers and not-for-profits to educational institutions and government.

Defining A Tech Ecosystem

A tech ecosystem is a network of interconnected, physically proximate firms and institutions related to tech or with jobs that rely on tech and require tech talent—combined with enabling organizations such as investors, workforce training providers, and entrepreneurial support groups.

DC Tech Ecosystem Size

95K

2022 Tech Ecosystem Workers

Non-Tech in Tech **26K**

Tech in Non-Tech **46K**

Tech in Tech **22K**

High-Tech Jobs **50K**

95K
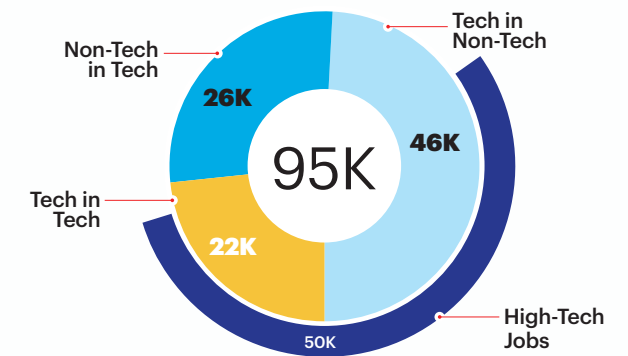
NOTE: Numbers may not add up due to rounding.

Job Growth 2012–2022

	DC Tech Ecosystem	DC Region Tech Ecosystem	DC All Jobs
2012	75K	417K	781K
2022	95K	465K	788K
	+22%	+12%	+1%
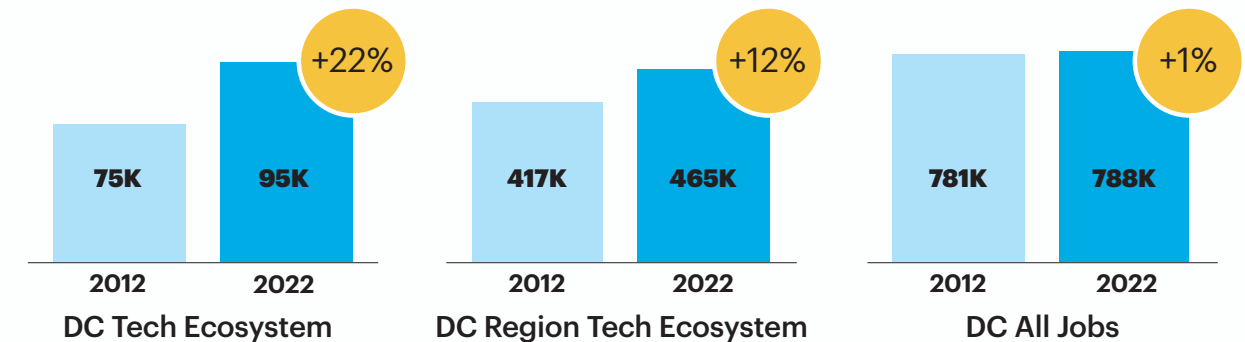
Median Wage 2022

$112,700
DC Tech Ecosystem

compared to

$90,000
DC All Jobs

SOURCE: LIGHTCAST, 2022.

DC's tech ecosystem is more diverse than that of the nation's as a whole–48% of DC tech workers are non-white, compared to only 32% of US tech workers.

Workers are particularly diverse in DC's tech in non-tech jobs–many of which are in government–indicating the unique opportunity offered by government as an anchor for the District. Charts on the opposite page show that 48% of DC tech ecosystem workers are non-white, as compared to only 32% in the US tech ecosystem overall. Further, 38% of DC tech ecosystem workers are women, as compared to 34% in the tech ecosystem nationwide.

Comparing demographic trends among tech workers against the city's overall workforce reveals an opportunity to make DC's tech ecosystem even more diverse. As shown on the diagram to the right, 25% of workers in the DC tech ecosystem identify as Black (compared to 31% of all DC workers), 7% as Latino (compared to 10% of DC workers), and 38% as women (compared to 55% of DC workers). (Comprehensive data on LGBTQIA+ and workers with disabilities is not currently available; therefore, this report focuses less on quantitative trends in these workers.)

The number of diverse workers in the DC tech ecosystem is growing. Despite the fact that the Black workforce in DC declined by 4% between 2012-2022–in parallel with a citywide loss of Black residents–the number of Black tech ecosystem workers increased by 15% (3,200 workers). Further, the number of Latino workers increased by 50% (2,200 workers), and the number of women workers increased by 35% (10,200 workers), outpacing their overall growth in DC across all sectors. But, because white and "other race" workers, as well as male workers, also increased substantially, representation among Black, Latino, and women workers as a percentage of all workers in the ecosystem has remained relatively flat.

The increase in women tech workers was largely driven by growth in tech-in-non-tech jobs. A large share of those jobs are in the federal government, which generally has stronger diversity and inclusion hiring practices than the private sector. These jobs, however, tend to pay less than jobs in the private sector, highlighting the importance of increasing representation outside of government. The increase in Black and Latino workers was more dispersed across the ecosystem.

In a Tech Ecosystem Sentiment Survey conducted for this report almost 50% of respondents stated there were very specific plans for increasing DEI at their organization, while 41% stated that there were general plans. Further, 87% of respondents stated that issues of DEI in the tech ecosystem were important to them personally. These survey results indicate that tech ecosystem firms and

workers value the goal of increasing DEI, and that there is an opportunity to help more organizations develop specific plans to achieve such goals.

Defining Diversity, Equity, And Inclusion (DEI)

Diversity is the representation of all individuals, collective identities, and differences (e.g., race, ethnicity, gender, disability, sexual orientation, etc.). Equity seeks to ensure fair treatment, equality of opportunity, and fairness in access to information and resources for all. Inclusion builds a culture of belonging by actively inviting the contribution and participation of all people.

Racial Distribution of Jobs 2022

Legend: ● White ● Black ● Latino ● Asian ● Other

DC High-Tech
| 47% | 28% | 6% | 16% | 3% |

DC Tech Ecosystem
| 52% | 25% | 7% | 11% | 5% |

All DC Workers
| 48% | 31% | 10% | 7% | 4% |

US Tech Ecosystem
| 68% | 9% | 9% | 13% | 1% |

Gender Distribution of Jobs 2022

Legend: ● Women ● Men

DC High-Tech
| 33% | 67% |

DC Tech Ecosystem
| 38% | 62% |

All DC Workers
| 55% | 45% |

US Tech Ecosystem
| 34% | 66% |
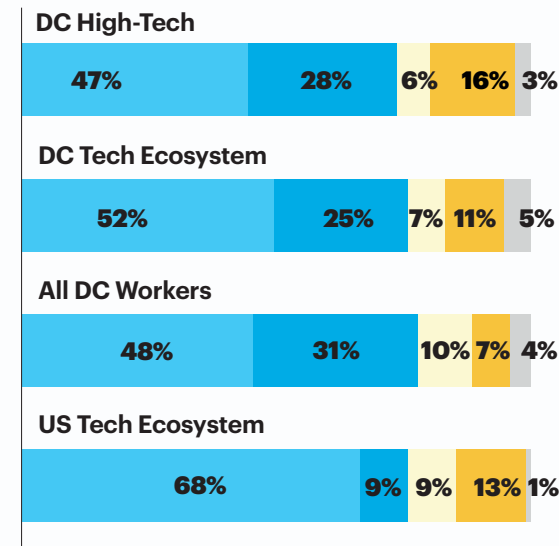
Change in DC Jobs by Race and Gender 2012-2022

Legend: ● DC All Sectors ● DC Tech Ecosystem ● US Tech Ecosystem

Women
- DC All Sectors: 1%
- DC Tech Ecosystem: 35%
- US Tech Ecosystem: 31%

White
- DC All Sectors: -1%
- DC Tech Ecosystem: 17%
- US Tech Ecosystem: 20%

Black
- DC All Sectors: -4%
- DC Tech Ecosystem: 15%
- US Tech Ecosystem: 25%

Latino
- DC All Sectors: 10%
- DC Tech Ecosystem: 50%
- US Tech Ecosystem: 30%

Asian
- DC All Sectors: 14%
- DC Tech Ecosystem: 52%
- US Tech Ecosystem: 33%

Other
- DC All Sectors: 50%
- DC Tech Ecosystem: 73%
- US Tech Ecosystem: 37%

All Workers
- DC All Sectors: 1%
- DC Tech Ecosystem: 22%
- US Tech Ecosystem: 23%
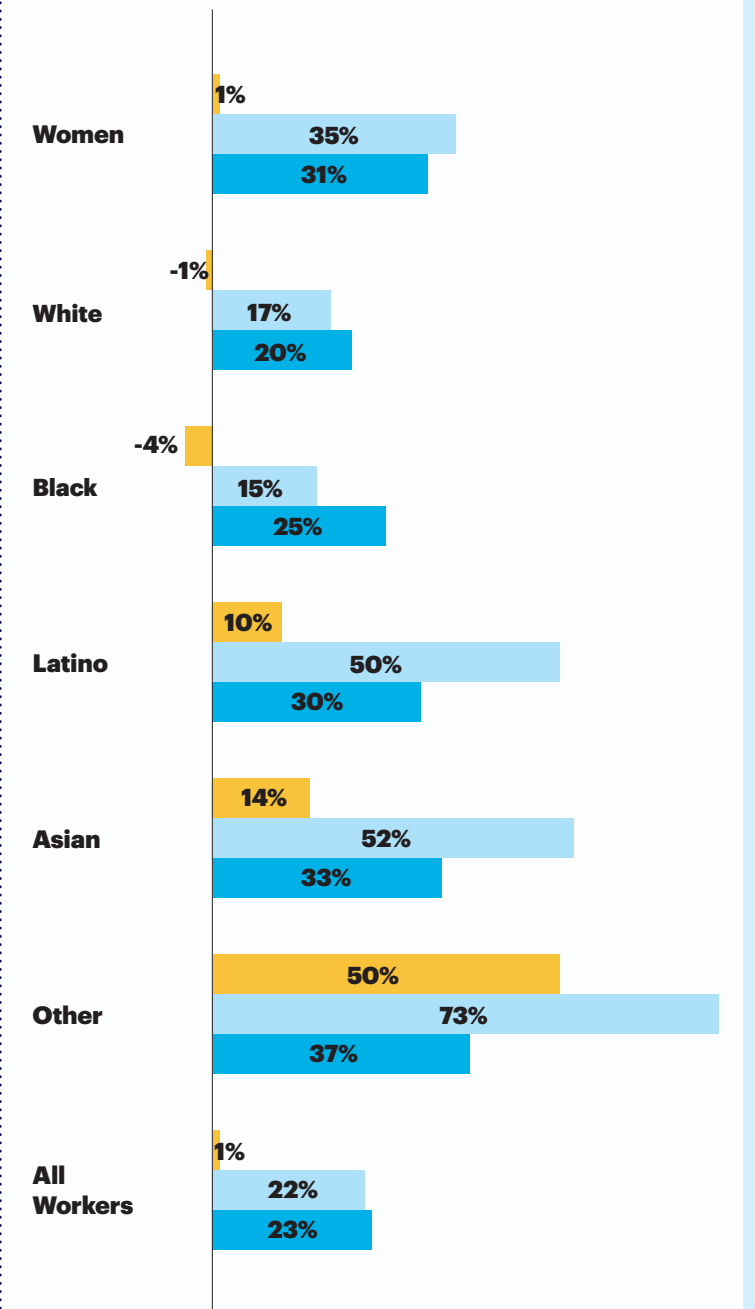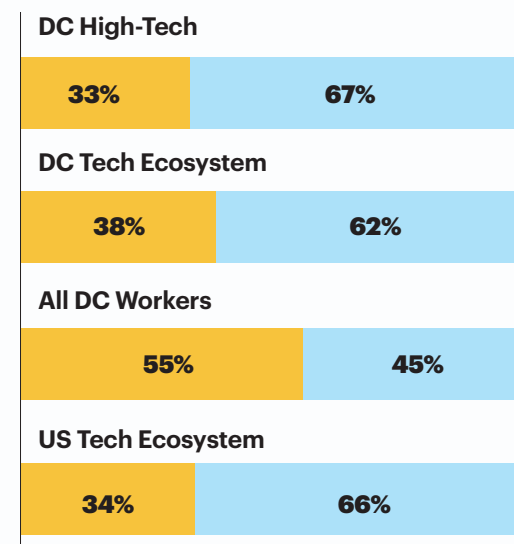
SOURCE: LIGHTCAST, 2022.

This report will demonstrate how the District can build upon its assets to be a national model for equitable, inclusive and resilient tech and innovation growth.

CHALLENGES AND OPPORTUNITIES

The goal of increasing representation in the tech ecosystem is to improve access fo diverse residents to high-paying jobs and opportunities for wealth-building through entrepreneurship. To reach this goal, DC needs to deploy strategies across four areas based on the Economic Development Pyramid described in more detail on page 21.

Ecosystem-Wide

With the federal government as an anchor, a strong base of research universities and think tanks, international institutions and a highly educated, diverse population, the value proposition of DC's tech ecosystem is strong. To attract investment and continue growing the number of opportunities within the local ecosystem, DC needs to better articulate and strengthen DC's tech brand. There is an opportunity to create a convening organization that can advocate for the sector, create a robust DC tech brand, and promote more diversity and inclusion, similar to ecosystem-building organizations in other cities, such as Tech:NYC in New York.

New Venture Development:

Intentionally providing greater access to capital, mentorship and training for founders of color and women will support diverse business growth. Stakeholders interviewed for this study highlighted an increase in the number of funds led by diverse individuals in the DC metro area and more capital secured by diverse entrepreneurs. There has also been an expansion of female-focused entrepreneurial hubs. In DC, female founders far exceed their share of total VC investment in DC vs the US as a whole (16% vs. 2.4% in 2021).[1] While Black founders' access to capital in DC is far too low, it slightly exceeds national trends: 3.5% of all VC funding in the District went to Black founders between 2015 and 2020, whereas Black founders only received 1.3% of all capital raised nationally in 2021.[2] Continuing to increase the share of venture capital raised by diverse groups will have ripple effects: growing companies hire more workers; diverse founders are more likely to hire diverse workers. Eventually, scaling companies to an acquisition, merger or public offering will lead to wealth building.

Career Pathways

Local and regional employers and consortiums are making commitments to lower barriers to advancement for diverse talent, including four-year degree requirements, lack of paid internships and apprenticeships, lack of transparency in salaries, and lack of diversity in leadership, which all create barriers to advancement for diverse talent in tech ecosystems across the country and in DC. In the region, Capital One hired 700 interns in 2021 for its paid Technology Internship program. The Greater Washington Apprenticeship Network aims to create 1,000 new apprenticeships in the region for non-traditional hires with the leadership of Accenture and Aon. Expansion of such efforts are needed to achieve a DC tech workforce that is as diverse as the city's population, including in managerial positions.

Talent Development

DC is investing in expanding CS education in its public schools, which is critical to leading students to in-demand, upwardly mobile careers in tech and other well-paying sectors. Access to CS education doubled between the 2018-2019 school year and the 2021-2022 school year. Continued increases in investment can help to close the gap between rates of access to CS education in DC compared to rates of access in Maryland and Virginia.

The District is also increasing funding for workforce training programs, which grew from $43.8 million in 2019 to $7.3 million in 2020, and $100.5 million in 2021. Workforce development is an important tool for growing a diverse talent pipeline. On our Tech Ecosystem Sentiment Survey, 77% of respondents said there was a need for more workforce training programs with stronger employer partnerships.

Opportunities and Challenges

This report identifies challenges and opportunities in ecosystem-wide trends, new venture development, career pathways and talent development.

"MISSING" WORKERS FROM DC'S TECH ECOSYSTEM

Analysis in this report estimates how many diverse workers–including Black, Latino and women workers–would need to be added to the DC tech ecosystem in order for it to be representative of DC's workforce as a whole. These numbers can be used to set future goals.

5,000
Black Workers

+21% increase in Black workers needed to reach parity.

3,400
Latino Workers

+51% increase in Latino workers needed to reach parity.

12,500
Women Workers

+32% increase in women workers needed to reach parity.

SOURCE: LIGHTCAST, 2022.

WeDC Fest 2018. SOURCE: WDCEP

The goal of this report is to make the District the undisputed national leader in building a diverse, equitable and inclusive tech ecosystem. It offers concrete recommendations to support that goal.

The recommendations in this report address the following challenges, which this study identified with quantitative research and extensive stakeholder outreach. Categories for these challenges are based on the Economic Development Pyramid, which was created by Rodney Sampson as a framework for economic development efforts grounded in diversity, equity and inclusion (See p. 21):

ECOSYSTEM-WIDE
Cross-Cutting Ecosystem Dynamics

NEW VENTURE DEVELOPMENT
Innovation, Entrepreneurship, Market Capital

CAREER PATHWAYS
Talent, Advancement, Retention

TALENT DEVELOPMENT
Education and Skills Development,
Early Exposure and Socialization

RECOMMENDATION

1. Create a tech ecosystem-building organization
   ECOSYSTEM-WIDE

   1a. Advocate for strengthening tech equity in public spending
   NEW VENTURE DEVELOPMENT CAREER PATHWAYS TALENT DEVELOPMENT

   1b. Serve as an industry-led, tech-focused workforce development partner
   CAREER PATHWAYS TALENT DEVELOPMENT

   1c. Produce a "State of the DC Tech Ecosystem" report
   ECOSYSTEM-WIDE

   1d. Develop a strong "DC brand" for tech
   ECOSYSTEM-WIDE

2. Conduct an analysis of K-12 CS and STEM education
   TALENT DEVELOPMENT

3. Incentivize the creation and expansion of apprenticeship and other certification programs
   CAREER PATHWAYS TALENT DEVELOPMENT

4. Increase funding to accelerators that support diverse, local founders
   NEW VENTURE DEVELOPMENT

5. Create a new private-sector-led fund to support diverse tech founders
   NEW VENTURE DEVELOPMENT

6. Co-create and pilot tech-driven civic solutions with local DC communities
   NEW VENTURE DEVELOPMENT TALENT DEVELOPMENT

Techstars Washington DC Powered By J.P. Morgan, Fall 2022 Cohort Demo Day. SOURCE: Techstars

STUDY OVERVIEW

GOALS AND METHODOLOGY

Through a survey, data analyses, interviews and focus groups, this study identifies strategies for the District to build equitable, inclusive and resilient tech, as well as innovation growth. This report also highlights data gaps and needs for future data tracking to ensure that progress can be better measured over time.

THIS STUDY EXPLORED THE FOLLOWING QUESTIONS:

1. What are the fundamentals and factors of inclusion within the DC tech and innovation ecosystem that enable all communities to participate and thrive?

2. How have conditions evolved since the 2016 Pathways to Inclusion report and the start of the COVID-19 pandemic?

3. Where are the barriers, needs, or misalignments of inclusion that are preventing the equitable participation of community members from all backgrounds?

4. What are new strategies and best practices that DC can leverage to be a leader in creating a diverse and inclusive tech ecosystem?

METHODOLOGY

This report builds upon the 2016 Pathways to Inclusion report to better quantify disparities and provide a foundation upon which to track progress.

Data Analysis

Quantitative analysis of data, including trends in sector growth, worker demographics, venture capital (VC) funding, computer science (CS) education and other contributors to equity in tech.

Tech Ecosystem Sentiment Survey

Online, public survey with 72 DC tech professionals. The purpose of the survey was to gather perspectives of stakeholders on the state of tech inclusion in DC and determine pain points that the District could help address.

Interviews and Focus Groups

Stakeholder engagement across a wide range of organizations, including employers, nonprofits, workforce development providers, education institutions, community-based organizations (CBOs) and government. Engagement included in-depth interviews with 18 stakeholders and five focus groups with 42 stakeholders.

FUTURE DATA TRACKING

Portions of this report depend on qualitative data—such as demographics of founders, LGBTQ tech workers, tech workers with disabilities, information on VC funding to diverse entrepreneurs and number of inclusive incubators—due to a lack of available quantitative data. Recommendations in this report include developing a tech ecosystem-building organization that can track data on trends in diversity and inclusion in the tech ecosystem over time, as well as by Ward to capture the place-based disparities that exist within the District.

ECONOMIC DEVELOPMENT PYRAMID

This report uses the Economic Development Pyramid as a framework to explore the inputs of an equitable tech ecosystem.

The **Economic Development Pyramid** is a framework for economic development efforts grounded in diversity, equity and inclusion.[3] The levels of the pyramid include:

Economic Development:
Wealth and Job Creation
Economic mobility, financial gain, multigenerational wealth.

New Venture Development:
Innovation, Entrepreneurship, Market Capital
Access to capital, mentorship and training that supports business development at all stages of growth for entrepreneurs from all backgrounds.

Career Pathways:
Talent Advancement Retention
Hiring practices that incentivize diverse recruitment and worker protections that support equitable compensation and advancement.

Talent Development:
Education and Skills Development, Early Exposure and Socialization
Early exposure and skilling programs that lead to in-demand, upwardly mobile careers.

SOURCE: RODNEY SAMPSON AND DELL GINES, 2019.

Big Idea CONNECTpreneur Forum in the Penn West Equity and Innovation District, Fall 2022.
SOURCE: Golden Triangle Business Improvement District

REPORT ORGANIZATION
This report is organized into the following chapters:
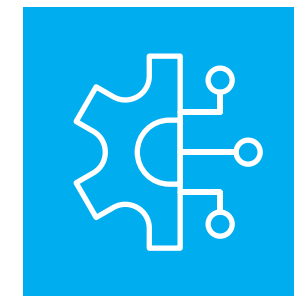
STATE OF THE TECH ECOSYSTEM

An overview of the strengths of the DC tech ecosystem, its size and composition, participation by underrepresented groups and sentiments from the survey of DC tech professionals.

CHALLENGES and OPPORTUNITIES

Challenges and opportunities in the ecosystem overall, as well as within new venture development, career pathways and talent development.
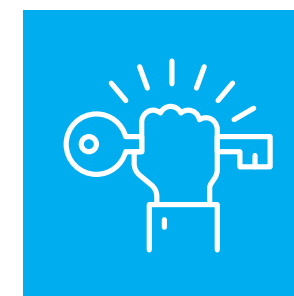
RECOMMENDATIONS

Six recommendations for improving diversity, equity and inclusion in the tech ecosystem, grounded in best practices and local needs.

SOURCE: iStock.com/Edwin Tan

STATE OF DC TECH ECOSYSTEM

Of the DC tech ecosystem's 95,000 workers, 51% are employed by tech industry employers, while 49% are in tech occupations within non-tech employers.

TECH INDUSTRIES

The District's tech ecosystem jobs are distributed throughout tech and non-tech industries and occupations, encompassing a wide range of jobs.

As shown on the diagram to the right, tech ecosystem jobs fall into three broad categories.

1. **Tech Occupations in Tech Industries—** Jobs that require technical skills that are in tech companies. For example, a front-end developer at EastBanc Technologies, a software development company based in DC. As of 2020, there were 1,200 firms in DC in tech industries

2. **Non-Tech Occupations in Tech Industries—**Jobs that are not related to tech but in a tech company. For example, a human resources manager at FiscalNote, a DC-headquartered company that provides data gathering solutions for legislation analysis and assessments of government risk.

3. **Tech Occupations in Non-Tech Industries—**Jobs that require technical skills but are not located in a tech company. For example, a network security specialist at the U.S. Department of Agriculture.

In addition, this report periodically focuses on **high-tech jobs**, which directly create

DC Tech Ecosystem 2022[4]

Tech Industries

High-Tech Jobs 19K
22K
26K
Non-Tech in Tech
Tech in Tech

Non-Tech Industries

High-Tech Jobs
31K
46K
Tech in Non-Tech
694K
Non-Tech

DC Tech Ecosystem

95K
Tech in Non-Tech 26K
Non-Tech in Tech 26K
46K High-Tech Jobs
Tech in Tech 22K
50K
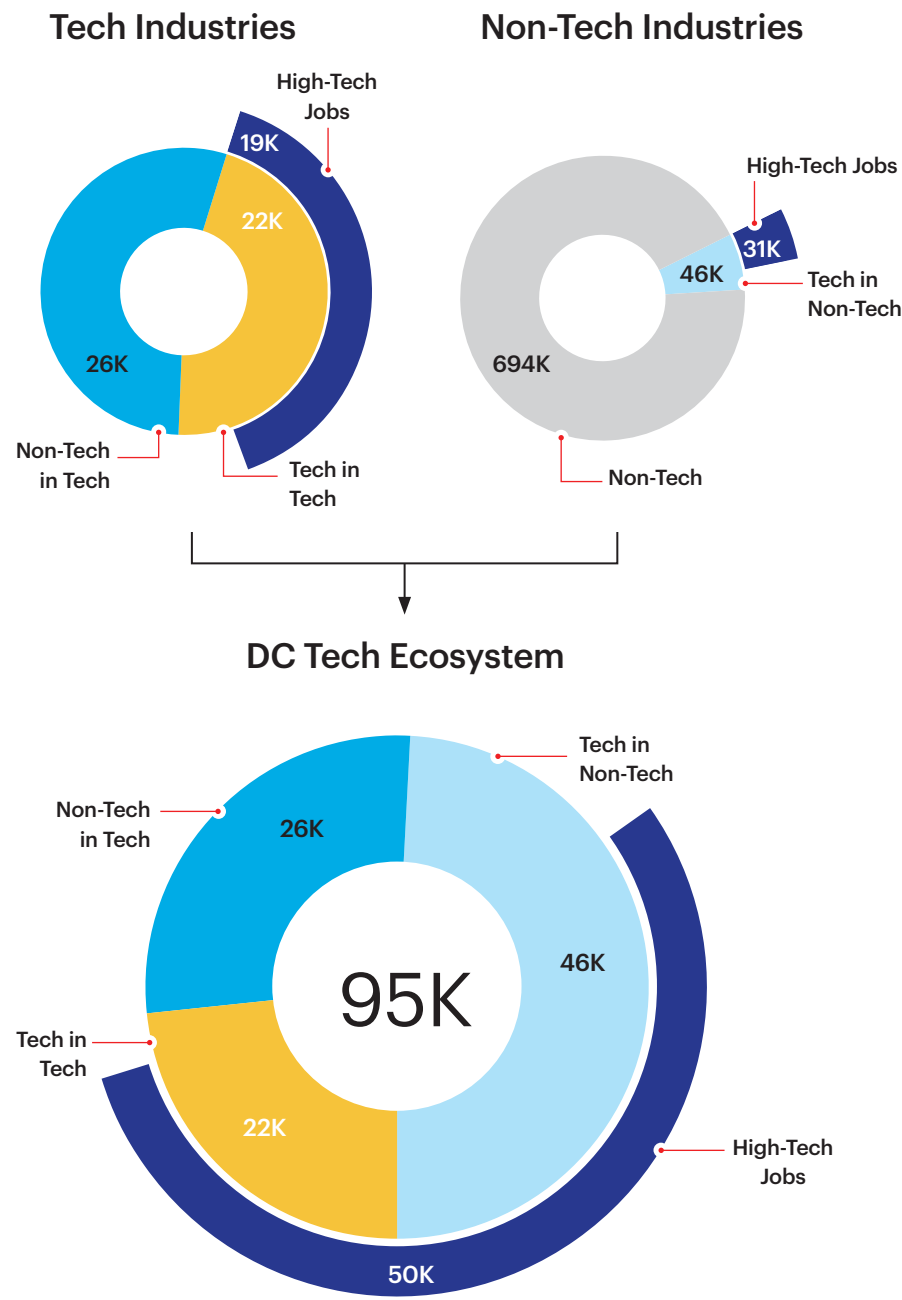
The federal government drives DC's tech ecosystem, while the private sector drives the region's ecosystem.

DC Tech Ecosystem Jobs by Industry 2022
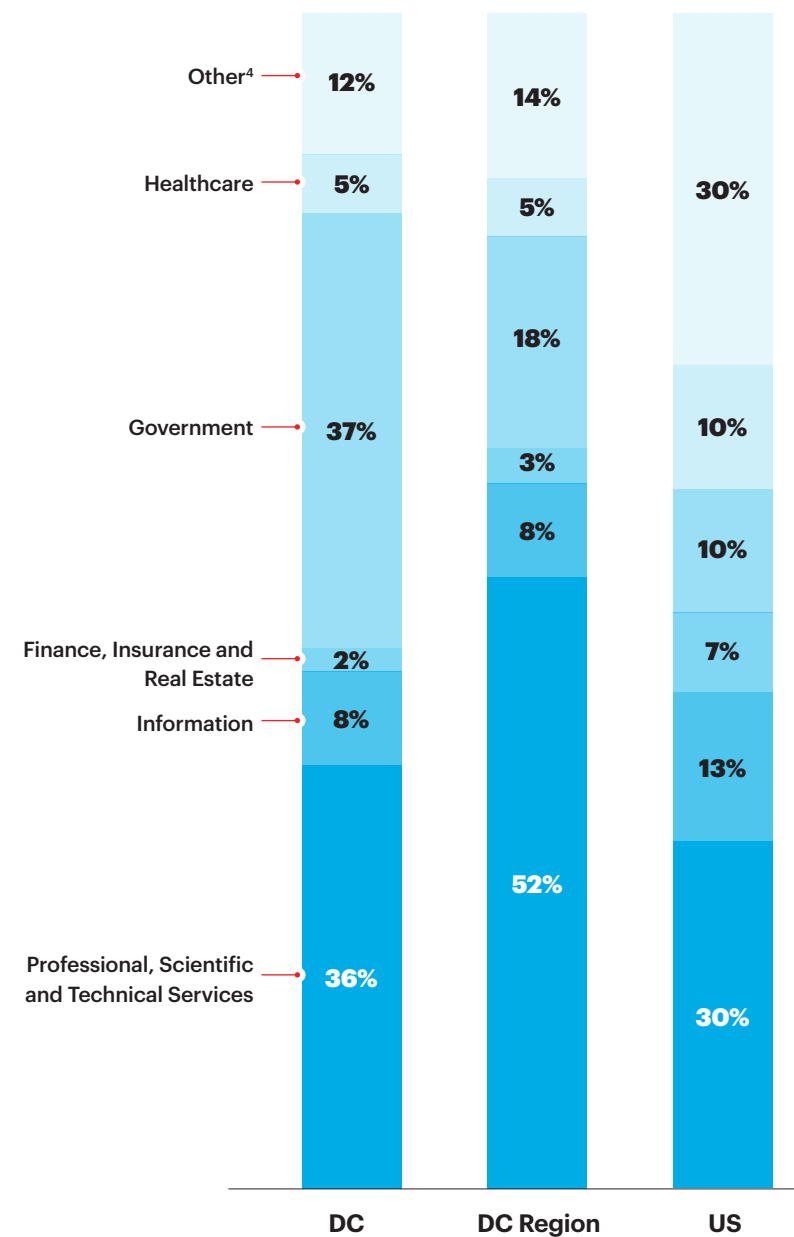
	DC	DC Region	US
Other[4]	12%	14%	30%
Healthcare	5%	5%	
		18%	10%
Government	37%	3%	10%
		8%	
Finance, Insurance and Real Estate	2%		7%
Information	8%		13%
Professional, Scientific and Technical Services	36%	52%	30%

or manage digital products, systems and services. These jobs are at the forefront of tech innovation and typically require highly technical skills, including knowledge of coding languages and network architecture, as well as a bachelor's degree.

High-tech jobs span several subcategories, including Developers, Data and Systems Analysts and Network Specialists. (See Appendix for full list of occupations.) High-tech jobs have emerged as opportunity areas for economic mobility based on expected income and job growth and share of the ecosystem.

The federal government is an important economic driver in the District's tech ecosystem. Over a quarter of all workers in the District work in the federal government. Similarly, the chart to the left demonstrates that 37% of all DC tech workers work in the public sector. 92% of those jobs are in the federal government.

The private sector plays a larger role in the regional tech ecosystem. This is driven by a variety of industries, including traditional tech companies, financial companies and other professional services. Major regional tech employers include Capital One, Amazon and Booz Allen Hamilton. The federal government also plays an important role in the region's tech ecosystem, as certain agencies who either employ or contract a large number of tech workers, including the National Security Agency and the US Department of Defense, are located outside of the District.

The District captured 38% of regional tech ecosystem growth between 2012-2022 despite accounting for only 22% of all regional jobs.

TECH ECOSYSTEM GROWTH
The District's tech ecosystem growth has significantly outpaced that of the region.

From 2012 to 2022, tech ecosystem jobs grew by 22%, adding 18,200 jobs, even as DC jobs grew by only 1% overall, driven by a loss of service jobs during the pandemic.

Further, between 2012 and 2022, DC's tech ecosystem grew by 22%, compared to only 12% growth in the rest of region, as indicated by the chart to the right. The District captured 38% of all tech ecosystem growth in the region, notable because the District only accounts for 22% of all jobs in the region.

The District has been able to attract and grow an array of tech companies. Companies that have started and scaled in the District include FiscalNote, Morning Consult, Class Technologies and Virtru.[5]

While tech ecosystem growth has been slower outside the District, the region still has a significant concentration of tech ecosystem jobs. In 2012, 12% of the region's jobs were in the tech ecosystem. This was almost double the US average and 2% more than the District.

Tech Ecosystem Job Growth 2012-2022

DC: 2012: 77K, 2022: 95K, +22%
DC Region: 2012: 417K, 2022: 465K, +12%
US: 2012: 10.3M, 2022: 12.7M, +23%
DC All Jobs: 2012: 781K, 2022: 788K, +1%
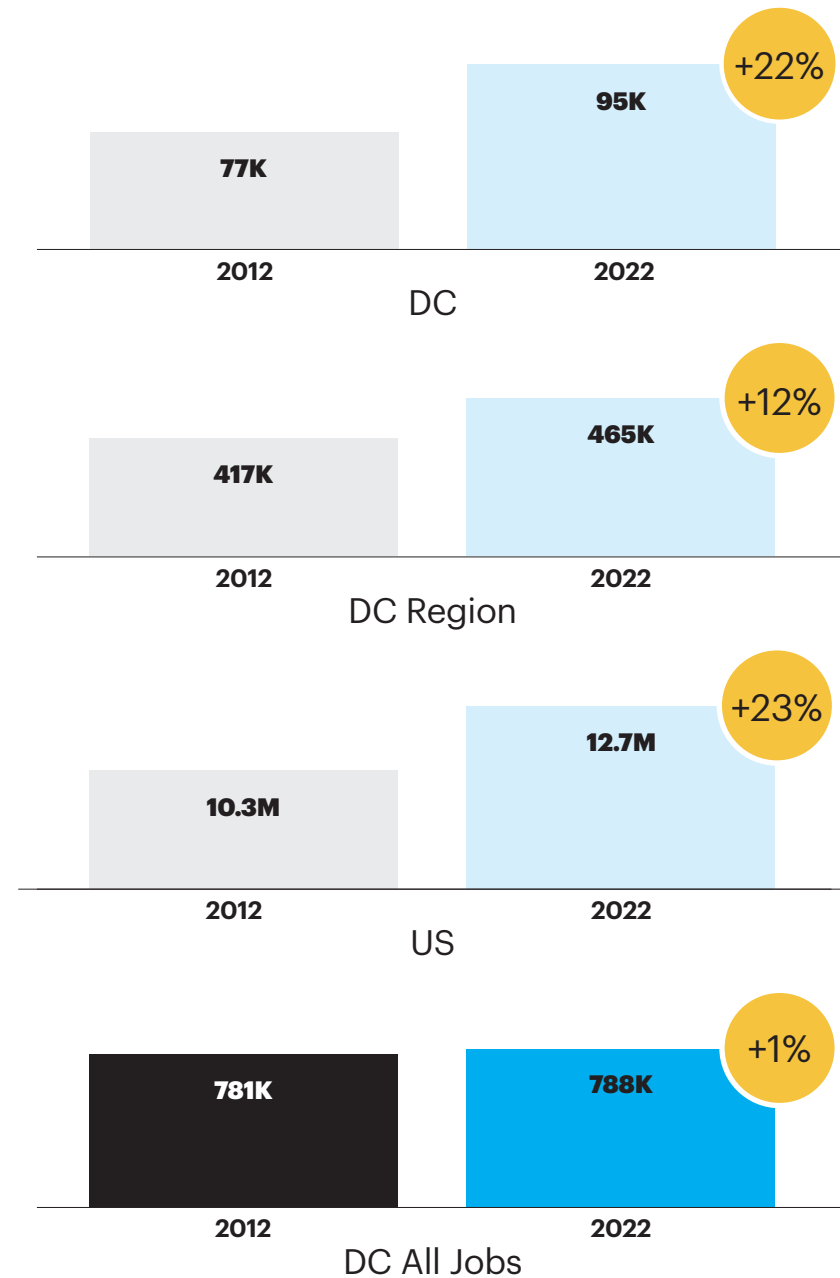
SOURCE: LIGHTCAST, 2022

DC's tech ecosystem is more racially diverse than the nation's—48% of DC's tech ecosystem workers are non-white compared to 32% in the US.

Racial Distribution of Jobs 2022

Legend: White, Black, Latino, Asian, Other

	White	Black	Latino	Asian	Other
DC High-Tech	47%	28%	6%	16%	3%
DC Tech Ecosystem	52%	25%	7%	11%	5%
All DC Workers	48%	31%	10%	7%	4%
US Tech Ecosystem	68%	9%	9%	13%	1%

Gender Distribution of Jobs 2022

Legend: Women, Men

	Women	Men
DC High-Tech	33%	67%
DC Tech Ecosystem	38%	62%
All DC Workers	55%	45%
US Tech Ecosystem	34%	66%
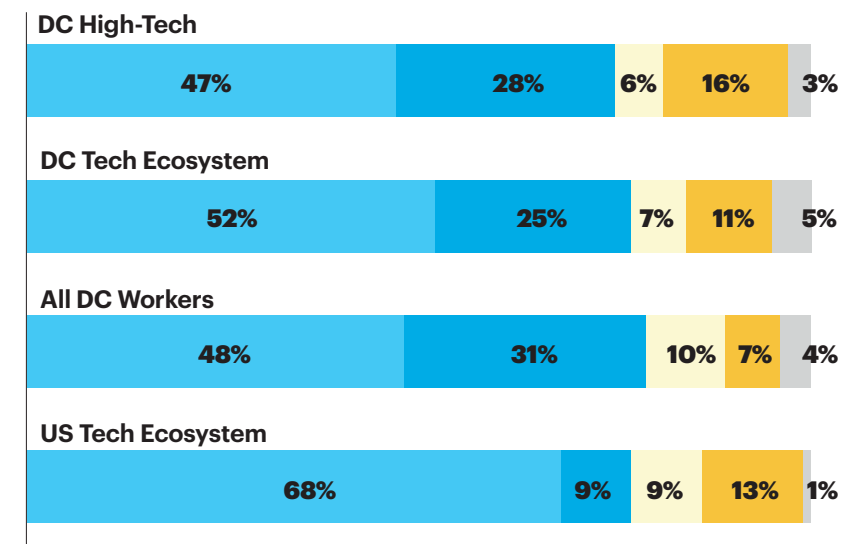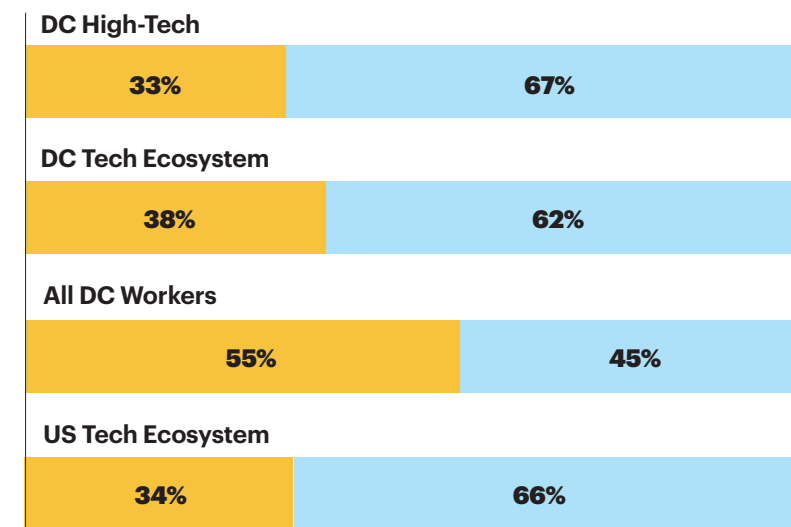
SOURCE: LIGHTCAST, 2022.

DIVERSITY IN THE TECH ECOSYSTEM
The District's tech ecosystem is more racially diverse than the country's—a solid foundation on which to build as DC continues to make progress towards representation that aligns with its population.

While the District's tech ecosystem is more diverse than the national tech workforce, its demographics do not yet match the demographics of the city's workforce as a whole. The chart to the left shows that Black and Latino workers make up 32% of workers in the tech ecosystem, while they account for 41% in the total DC workforce. Further, women account for 38% of tech ecosystem workers in DC but 55% of the overall DC workforce.

In subsequent sections, this report offers recommendations to help close the 9% representation gap of Black and Latino workers and the 13% representation gap of women workers.

HIGHER-PAYING OCCUPATIONS

The tech ecosystem offers significant opportunities for career advancement and wealth-building due to higher average salaries and job growth expectations, particularly in high tech occupations. There are 4,300 more Black and Latino workers in high tech jobs in 2022 than there were in 2012. The tech ecosystem has made the greatest strides with women—7,700 more women hold high tech jobs in 2022 than in 2012. This should be built upon by increasing diversity in high-paying occupations.

The chart to the right includes the 10 largest tech ecosystem occupations in DC by number of workers, organized by median hourly wages, ranging from $37/hour to $70+/hour.

Black workers make up 25% of tech ecosystem workers and 31% of all DC workers. They are generally overrepresented in relatively lower-paying occupations (under $60/hour), and are underrepresented in the two highest-paid occupations, holding 22% of those jobs. The latter is almost on par with their representation in the tech ecosystem overall, but short of their overall share of the workforce.

Latino workers are fairly well-dispersed across these occupations, with representation ranging between 6% to 9% among the top 10 occupations. By comparison, overall, they represent 7% of all tech ecosystem workers and 10% of the DC workforce as a whole.

Women represent 38% of the DC tech workforce and 55% of the city's entire workforce, and are over-represented in lower-paid operations, such as research analyst positions and statistician occupations. Women also comprise 39% of workers in general and operation manager occupations,

Representation of Black, Latino, and Women Workers in 10 Largest Tech Ecosystem Occupations in DC
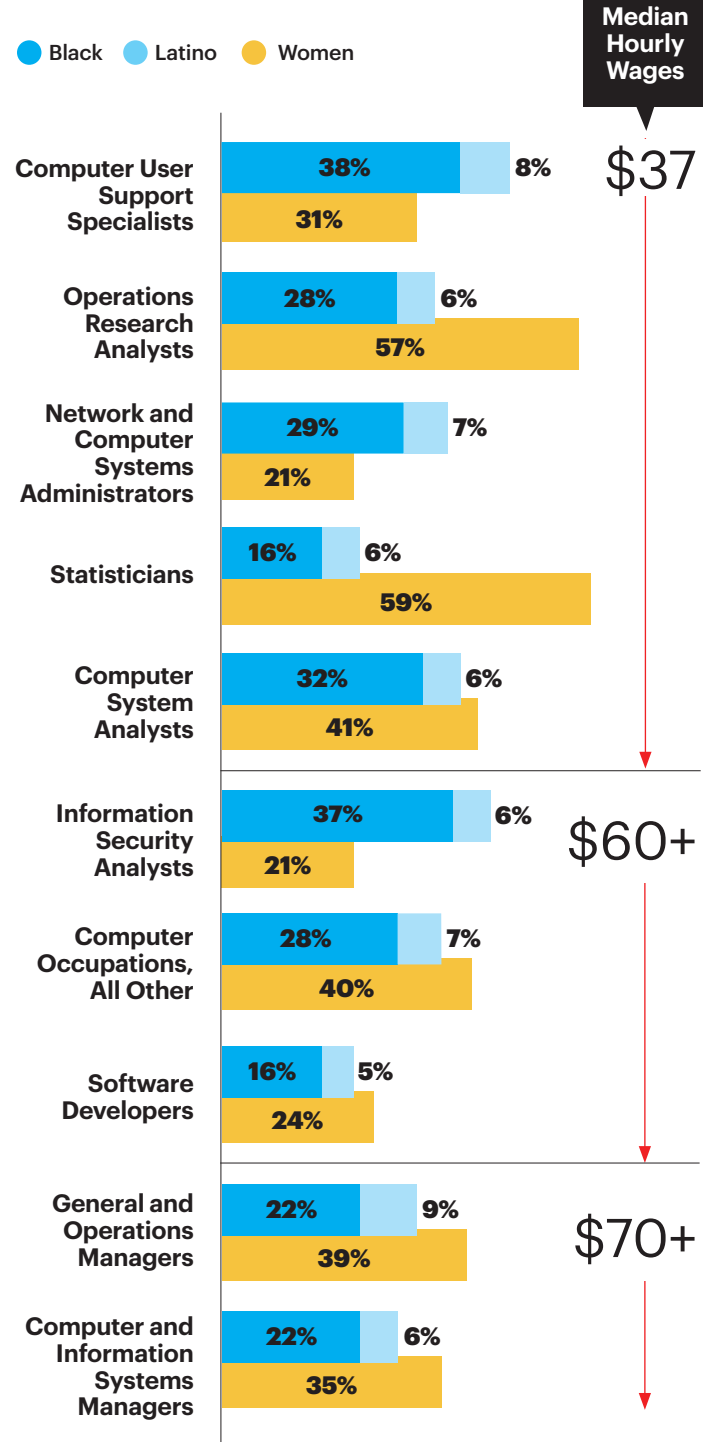
SOURCE: LIGHTCAST, 2022.

Change in DC Jobs by Race and Gender 2012-2022
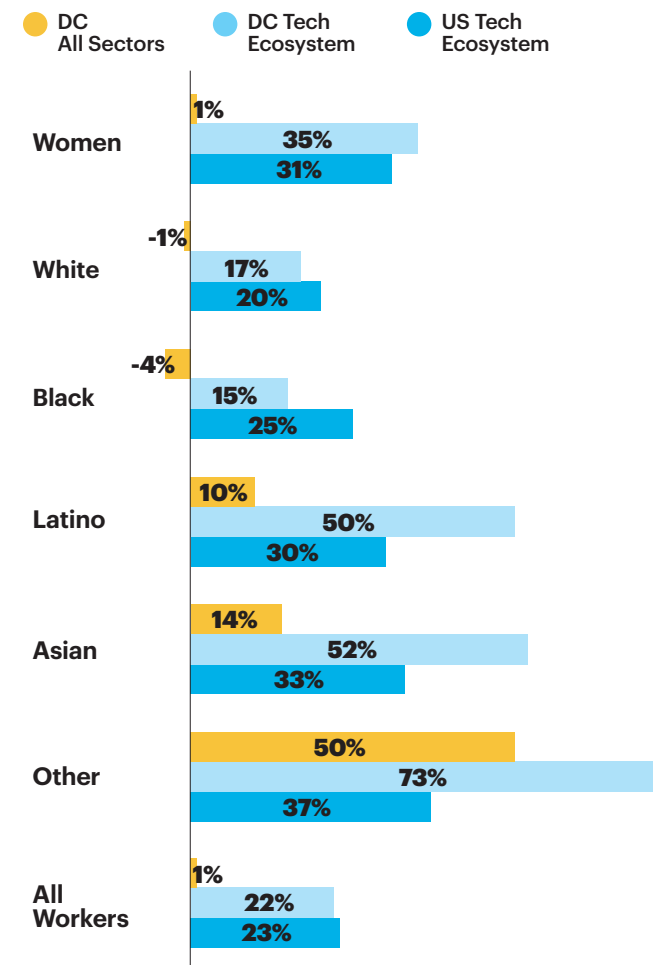
SOURCE: LIGHTCAST, 2022.

one of the top two highest paying occupations in the tech ecosystem. This is on par with their representation in the tech ecosystem overall, but short of their representation in the DC workforce.

Representation in management occupations is important not only to provide higher paying jobs opportunities to diverse workers, but to pave the way to success for more junior talent. Recommendations in this report identify strategies not just to connect diverse talent to the tech ecosystem, but to promote pathways for advancement and growth.

JOB GROWTH BY RACE

Over the past 10 years, growth in Black, Latino and women workers in the tech ecosystem outpaced their total growth across all sectors in DC-reflecting that jobs in DC overall only increased by 1%, driven by job losses in certain service sectors during COVID. This suggests that tech ecosystem jobs were a more resilient source of employment for diverse workers during the pandemic.

As shown on the chart to the left, in DC between 2012-2022, the number of Black tech ecosystem workers increased by 15%, the number of Latino workers increased by 50%, and the number of women workers increased by 35%, outpacing their growth across DC jobs as a whole. Moreover, growth of Latino and women workers in the tech ecosystem outpaced the 22% growth of the tech ecosystem overall. Tthe growth in Black workers, however, did not keep pace with overall tech ecosystem growth. Despite this growth, Black, Latino, and women workers' representation across the tech ecosystem has remained relatively flat due to the significant growth in white, "other race"[6] (including many biracial workers), and male workers. In other words, the overall growth of the tech ecosystem has generated more jobs for diverse workers, but intentional efforts to create a more diverse talent pipeline are still needed to create a tech ecosystem workforce that is reflective of the demographics of DC's population as a whole.

Growth in tech ecosystem for women was driven by growth in tech-in-non-tech jobs. This can partially be attributed to the concentration of those jobs in federal government, which generally has stronger diversity and inclusion hiring practices than the private sector and can provide good benefits and quality of life for workers. These jobs, however, are generally lower paying than jobs in the private sector. Growth in Black and Latino workers was more dispersed across the ecosystem.

THE TECH ECOSYSTEM SENTIMENT SURVEY REVEALED THAT DEI IS A PRIORITY FOR WORKERS AND BUSINESSES.

A Tech Ecosystem Sentiment Survey captured the perspectives of DC tech professionals on the state of diversity, equity and inclusion.[7] The digital survey was developed and distributed broadly via WDCEP, DMPED, community partners, local media and social media. While respondents expressed support for DEI, respondents of color had greater concerns than white respondents about conditions today and future progress.

ABOUT THE RESPONDENTS

- Survey respondents included tech professionals who live in the District and/or work for a company with a physical presence in the District. Respondents worked for a variety of companies, including traditional tech companies, start-ups and technical support providers.

- Over 40% of the respondents were founders/entrepreneurs, 17% a senior manager/director, and 17% an analyst/associate.

- 38% of respondents identified as Black or African American, 8% as Latino, 7% as Asian, 3% as American Indian or Alaska Native, and 1% as Native Hawaiian or other Pacific Islander.

- 57% of respondents who indicated their gender identified as female and 43% identify as male.

- 10% of respondents were 18–29, 28% were 30–39, 13% were 40–49, 14% were 50–59, and 14% were 50+ years old.

87%

of respondents stated that DEI in the tech ecosystem is personally important to them.

In your view, is the District of Columbia's tech ecosystem becoming more or less diverse, equitable, and inclusive?

- % All Respondents
- % Respondents of Color
- % White

RESPONSES BY RACE

	More diverse, equitable, and inclusive	Neither more nor less	Less diverse, equitable, and inclusive
% All Respondents	26%	49%	25%
% Respondents of Color	32%	39%	29%
% White	29%	65%	6%
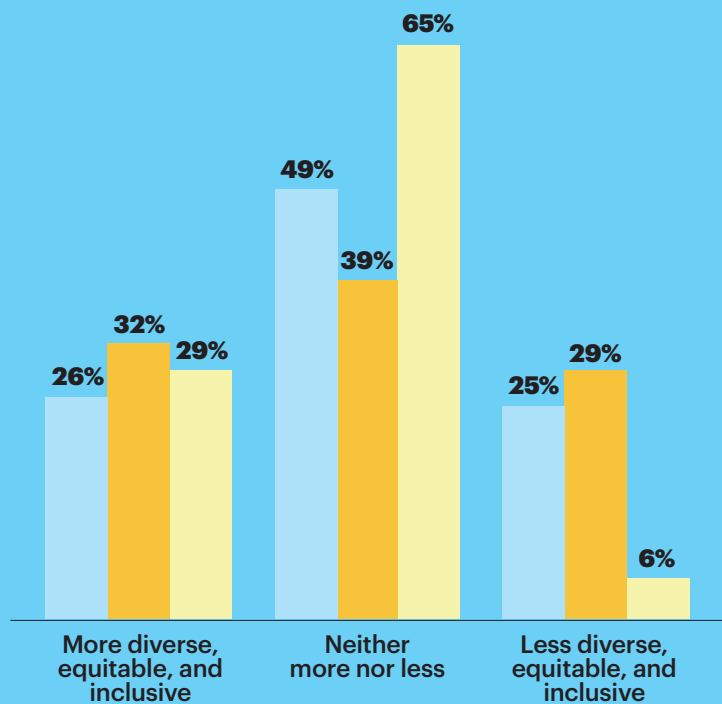
In your view, which of the following best describe the tech ecosystem in the District of Columbia?

Competitive	31%
Diverse	25%
Exclusive	24%
Thriving	22%
Innovative	22%
Supportive	19%
Stagnant	19%
Elitist	19%
Inclusive	18%
Well-Rounded	13%
Equitable	6%
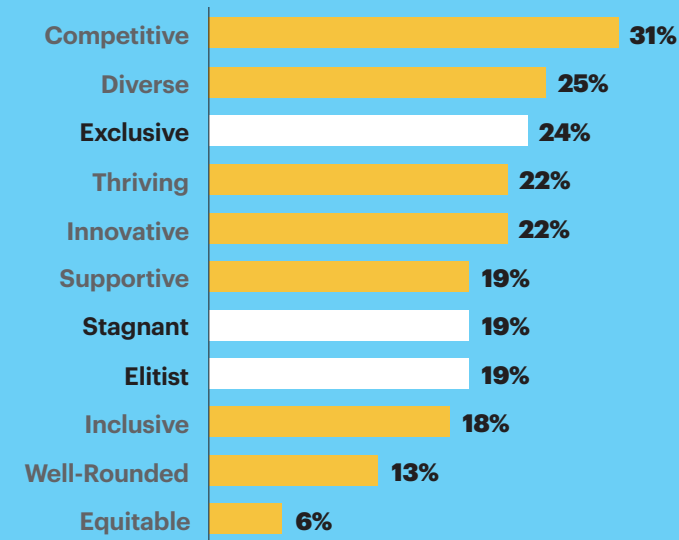
RESPONSES BY RACE:

Respondents of color were more likely to describe the tech ecosystem as **"Stagnant"** and **"Elitist"** than white respondents..

How much of a priority, if at all, is it to the company/organization that you work for to address issues of diversity, equity and inclusion within the workplace?

A top priority — 64%

An important but not top priority — 28%

Not too important a priority — 7%

Not a priority at all — 1%
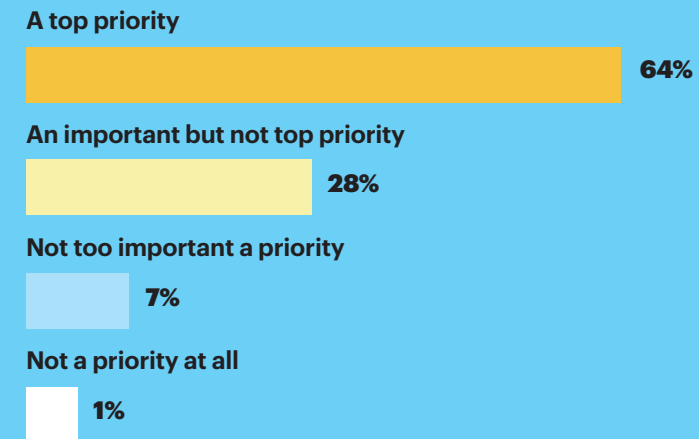
RESPONSES BY RACE:

71% of respondents of color and **41%** of white respondents indicated that issues of diversity, equity and inclusion were top priorities in their place of work.

How specific, if they exist at all, are the plans for increasing diversity, equity and inclusion at the company/organization for which you work?[6]

41% General plans, but not very specific

10% I am not aware of plans

49% Very specific plans

90% of firms have plans
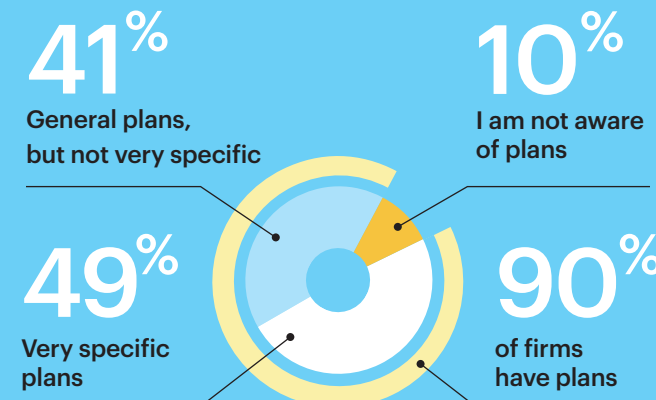
RESPONSES BY RACE:

60% of respondents of color were aware of specific plans at their place of work for increasing diversity, equity, and inclusion, but only **41%** of white respondents were aware of specific plans.

Black, Latino, and women workers' under-representation and lower pay in the tech ecosystem results in $713M dollars of foregone income.

THE TECH ECOSYSTEM GAP

The large number of "missing" diverse workers is compounded by the earnings gap experienced by workers of color and women compared to their white and male counterparts.

Missing Workers

While DC's tech ecosystem is more diverse than the nation's, it is not yet representative of the District's workforce. This report quantifies the number of "missing" workers as the number of diverse workers that would need to be added in order for the tech ecosystem to be representative of DC's overall workforce. This includes 12,500 missing women workers, 5,000 missing Black workers and 3,400 missing Latino workers. These numbers offer targets for intentional efforts to create a more inclusive tech ecosystem in DC.

Our analysis also estimates there are 900 missing LGBTQIA+ workers and 5,000 missing workers with disabilities–although these numbers are likely to be underestimates. (The data available on the overall size of DC's LGBTQIA+ workforce counts only those living in a same-sex household and does not capture other members of the LGBTQIA+ community.) DC's workers with disabilities are similarly undercounted in available data sources. DC is actively working to increase workers with disabilities' representation in tech. Through the SBA Community Navigators Pilot, the National Disability Institute is working with local DC organizations like 2Gether-International to strengthen outreach to businesses owned by individuals with disabilities for the purposes of collecting data and connecting these small businesses to critical resources and assistance.

Income Gap

The DC tech ecosystem **income gap** captures the additional earnings Black, Latino and women workers would receive in aggregate if the earnings and representation gaps in tech were eliminated. (The **income gap** is the sum of the **earnings gap** and **representation gap**.

- The **earnings gap** is based on the difference between diverse workers' wages and white or male workers' wages. We multiplied the gap in wages received by Black, Latino and women workers by the total number of Black, Latino and women workers currently in the ecosystem, respectively, to estimate the earning gap. This gap is $146 million for Black workers, $33 million for Latino workers, and $225 million for women workers.

- The **representation gap** estimates the total additional wages that would go to diverse workers if the "missing" Black, Latino and women workers were hired into the ecosystem. The representation gap is $72 million for Black workers, $44 million for Latino workers, and $193 million for women workers. (The earnings and representation gaps are much lower for Latino workers because they comprise a smaller share of the overall workforce.)

If the number of Black, Latino and women workers in tech were representative of DC's workforce as a whole, and if all Black, Latino, and women workers in the tech ecosystem were compensated on par with white and male workers, an additional $713 million would go towards wealth-building among these diverse workers. The size of this **$713 million income gap** demonstrates the economic opportunity that could be created by intentional efforts to achieve both representation and pay equity in the tech ecosystem.

DC Tech Ecosystem Missing Workers

How many workers must be added to create a tech workforce representative of DC's as a whole?

12,500
Women Workers

5,000
Black Workers

3,400
Latino Workers

DC Tech Ecosystem Income Gap

What would be the additional income to Black, Latino and women workers if the wage and representation gaps in tech were eliminated?

$218M
Black Workers

$77M
Latino Workers

$418M
Women Workers

SOURCE: LIGHTCAST, 2022; PUMS 2019.

Up to 130,000 DC residents, primarily in Wards 5, 7 and 8, are hindered from accessing and/or effectively using high-speed internet in their homes.

BROADBAND

High-speed internet access is essential 21st century infrastructure and a prerequisite to economic inclusion. Powered by federal and local investments, DC is committed to ensuring all its residents have equitable access to affordable, high-speed and reliable internet, and are empowered with the devices, tech support, digital literacy and skills to effectively use it.

The importance of broadband has become particularly apparent during the COVID-19 pandemic. Access to broadband is increasingly necessary for accessing economic opportunity—including access to education, workforce development, employment, and social and government services. In fact, there is a strong correlation between broadband availability, jobs and GDP growth. Nationwide, a increase in broadband access in 2014 by 10 percentage points would have resulted in more than 875,000 additional US jobs and $186 billion in additional economic output in 2019—an average increase of 175,000 jobs and $37.2 billion in output per year.[8]

The District is hard at work to address the range of barriers to digital equity, including the adoption gap (lack of subscriptions to

Adoption Gap:

53K DC households (18% of total households), with 100K residents, lack subscriptions to high-speed internet.

Affordability:

Residents in **47K households** would need to pay more than 2% of their gross income for a $40/month subscription.

Devices Gap:

26K DC residents live in households without any internet-enabled device (such as a smartphone, laptop or tablet), and an additional 44K only have a smartphone.

Digital Literacy Gap:

76K DC residents lack the digital literacy skills to engage in basic online tasks (such as searches, e-health, and accessing government benefits).

DC Adoption Gaps

Adoption gaps-lack of subscription to high speed internet-disproportionately impact lower income, Black, Latino and Asian households.

Income

● Internet Subscription   ● No Subscription

< 100%	< 101–200%	< 201–300%	> 300%	Federal Poverty Line
35% / 65%	24% / 76%	12% / 88%	5% / 95%	
46K	45K	38K	181K	Residents

Race

White	Black	Latino	Asian	
3% / 97%	18% / 82%	12% / 88%	7% / 93%	
236K	290K	73K	25K	Households

SOURCE: ACS, 2021

As shown on the charts to the left, 35% of residents with incomes below the federal poverty line (FPL) lack an internet subscription, as compared to 5% at 3x or more the FPL. Moreover, 82% of DC's Black residents have internet subscriptions compared to 97% of white residents. These inequitable adoption gaps extend past access to broadband but could also mean less reliable and slower service.

There is also a significant affordability gap, as residents of 47,000 DC households would need to pay more than 2% of their gross income for the average cost of an internet subscription.

However, the District is actively working to address these challenges and has launched several programs over the past few years to offer low-cost and no-cost broadband access, as described on the following page.

Device and digital literacy gaps are also significant for many residents. 28,000 DC residents live in a household that lacks an internet-enabled device, and an additional 44,000 only have a smartphone. Further, 76,000 DC residents lack the digital literacy skills to engage in basic online tasks.

high speed internet),
affordability gap, devices gap (lack of internet-enabled devices) and digital literacy gaps.

Overall, 53,000 DC households–18% of all households, impacting 100,000 residents–lack subscriptions to high-speed internet. Analysis reveals that digital adoption gaps in DC disproportionately impact lower-income households and households of color.

Connect Potomac Gardens provides the 700 residents of Potomac Gardens with free high-speed Wi-Fi service in their apartments and common areas. SOURCE: Tech Together.

SPOTLIGHT ON DC DIGITAL INCLUSION EFFORTS
The District is actively working to close the digital divide in DC.

Highlighted as a goal of the DC Comeback Plan, the District is committed to ensuring all DC residents have equitable access to affordable and reliable high-speed internet. The plan will also empower residents with the devices, tech support, digital literacy and skills to effectively use the internet. Led by the State Broadband and Digital Equity Office, which is housed in the Office of the Chief Technology Officer (OCTO), DC's inclusion efforts are predicated on three key points:
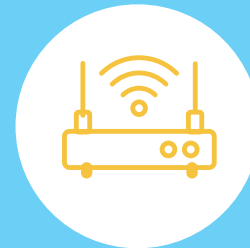
Achieving high-speed, affordable, and highly accessible broadband is a prerequisite to economic inclusion.

Digital literacy training programs and skills development are needed to navigate the job market and access information online in the 21st century economy.

Pathways to higher-wage tech jobs and internship opportunities are necessary to improve economic outcomes for DC residents.

To improve DC's digital inclusion and accessibility efforts during the COVID-19 pandemic, the District focused on improving broadband. In the summer of 2020, Mayor Bowser and OCTO launched Tech Together DC. This initiative includes a broad range of partners: broadband service providers, tech companies, workforce development organizations, the DC Public Library, universities and community colleges.

In the fall of 2020, Mayor Bowser launched **Internet for All** to provide in-home internet free-of-charge to households with PK3–12th grade students attending DC public and charter schools, including adult charter schools. Between the launch and September 2022, over 5,000 eligible residents received free high-speed internet in their homes. Building on this work, in May 2022, the District announced the **DC Community Internet Program**, which offers internet service providers access to place equipment on city-owned rooftops at no cost if providers commit to offering reduced- or no-cost internet service to qualifying households. That same month, the District launched a pilot program to provide free high-speed Wi-Fi service at DC Housing Authority properties. By the end of 2022, 1,000 residents at three properties (Potomac Gardens, Hopkins Apartments and Greenleaf Senior Apartments) were receiving free Wi-Fi service.

The Bowser Administration views broadband and digital equity as essential steps to ensure that every resident and business in all eight wards of DC can live, work, and thrive in the digital age, without bias or barriers. Currently, OCTO is researching and planning transformative, equitable and sustainable investments that will provide all residents with access to high-quality, affordable broadband and enable them with devices and digital skills to effectively use it. Over the next four years, DC has the potential to receive at least $120 million in federal funds (from the Bipartisan Infrastructure Law; Broadband Equity, Access and Deployment Program; Digital Equity Act; American Rescue Plan Act: Capital Projects Fund) to invest towards that vision.

CHALLENGES AND OPPORTUNITIES

DC Startup Week 2022. SOURCE: DC Startup Week 2022

Since 2016, DC has made strides towards creating a more equitable tech ecosystem across each level of the pyramid—New Venture Development, Career Pathways and Talent Development. However, people of color, women, LGBTQIA+ individuals and people with disabilities still face barriers to starting and scaling tech businesses and to finding tech jobs. They also face hurdles advancing in tech careers and adopting tech-related skills.

For this report, trends and strategies to promote greater diversity, equity and inclusion–and build upon existing successes–are outlined across the following four aspects of the tech ecosystem:

ECOSYSTEM-WIDE
Cross-Cutting Ecosystem Dynamics

NEW VENTURE DEVELOPMENT
Innovation, Entrepreneurship, Market Capital

CAREER PATHWAYS
Talent, Advancement, Retention

TALENT DEVELOPMENT
Education and Skills Development,
Early Exposure and Socialization

In each of these categories, there are three types of access that must be available to diverse tech ecosystem participants, which represent this report's assessment of areas for improvement:

FOCUS AREAS

INFORMATION
Access to education and information from formal and informal networks that facilitates full participation in the tech ecosystem.

FUNDING
Access to financial resources to create start-ups and to support programming that promotes equity and inclusion.

RELATIONSHIPS AND GATEKEEPERS
Access to professional and mentor networks, as well as individuals who control access to resources and opportunities.

Finally, this section identifies existing successes in the District to build upon to create a more equitable tech ecosystem.

SUCCESSES AND NEEDS

ECOSYSTEM-WIDE

Cross-Cutting Ecosystem Dynamics

SOURCE: iStock/Goodboy Picture Company

Advances that can underpin a more diverse and equitable tech ecosystem have been made since the 2016 report, including hiring DC's first Chief Equity Officer, increasing the number of VC funds led by diverse individuals and launching new organizations that support women in tech. Obstacles to an inclusive and diverse tech ecosystem, however, remain in DC, including the need to reinforce DC's nascent tech brand, improve metrics tracking and convene a tech community that can collectively advocate for equity.

SUCCESSES TO BUILD ON

ADVANCES SINCE THE 2016 PATHWAYS REPORT

The District's first Chief Equity Officer was hired in April 2021. This provides an opportunity to develop and evaluate relevant government programs to ensure equitable outcomes and accountability.

The number of funds led by diverse individuals and capital secured by diverse entrepreneurs appears to have increased in the DC metro area. While data is not available, a number of stakeholders observed this trend anecdotally.

The number of organizations focused on supporting women in tech, such as Girls in Tech DC, an organization to help build and support a diverse and inclusive tech workforce, has grown. **Awareness of the importance of**

technology in creating equitable access to education, jobs, government services and other resources has grown due to COVID-19.

In the Tech Ecosystem Sentiment Survey, the three most-used descriptors of the ecosystem were "competitive," "diverse," and "inclusive."

Through the SBA Community Navigators Pilot, the National Disability Institute is working with local DC organizations like 2Gether-International to strengthen outreach to underserved businesses and collect data while connecting these small businesses to critical resources and assistance.

Mayor Bowser and Amber Hewitt, Director of the Mayor's Office of Racial Equity (ORE), released the District's first-ever Racial Equity Action Plan on November 16, 2022.
SOURCE: Executive Office of the Mayor, Courtesy of Khalid Naji Allah

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TECH ECOSYSTEM NEEDS

INFORMATION NEEDS

- A stronger DC tech brand
- Regular, coordinated public metric tracking

RELATIONSHIP AND GATEKEEPER NEEDS

- A more cohesive tech ecosystem that can coordinate to advance equity efforts

A stronger, nationally recognized "DC brand" for the tech sector that leverages the District's unique assets is needed. Stakeholders interviewed observed a lack of external clarity around the DC tech ecosystem's identity and strengths. This results in a lost opportunity for attracting founders and funding, which could–if improved–drive further growth, expanding the number of tech jobs for all, including diverse participants. The strong, unique concentration of the federal government, non-profits and NGO's within DC, foster innovation in government tech, civic tech, and health tech sectors. This was highlighted by some as DC's unique value proposition. There is an opportunity to better brand, promote and articulate this.

More robust data gathering and tracking–by a centralized ecosystem-building organization as well as by individual employers and service providers–is needed to monitor progress in creating a more equitable tech ecosystem. Better data creates a better sense of accountability in terms of training, hiring and retaining diverse talent, or funding to support diverse businesses. Creating a framework for tracking metrics consistently and repeatedly is important for meaningful impact. More granular data is also needed to analyze place-based disparities across the District (by Ward) to produce targeted strategies for increasing access to opportunities in the tech sector.

Stakeholders spoke of a need for greater interconnectedness in the District's tech ecosystem in order to support the growth of the sector. Stronger connections between funders, entrepreneurs and talent can help stakeholders advocate for the sector and build partnerships. For talent development, there is no intermediary organization convening, advocating or supporting the workforce development community. There is also no one-stop shop convener for Black entrepreneurs to build connections, access mentorships, raise funds or support accountability across the ecosystem. Many Black and brown entrepreneurs also flagged the lack of a physical convening space for them. A large convening organization could promote and advocate for the growth of the tech sector, with a mission of fostering equity in the tech ecosystem.

CHALLENGES AND OPPORTUNITIES

NEW VENTURE DEVELOPMENT

Innovation, Entrepreneurship, and Market Capital

DC's tech ecosystem must provide equitable access to the capital, mentorship and training that supports business development at all stages of growth. Diverse entrepreneurs face barriers to information about founding and growing a business as well as to funding relationships and mentoring. Expanding upon the work of existing DC organizations serving founders with disabilities, female founders and founders of color can help build a more inclusive entrepreneurial environment.

SUCCESSES TO BUILD ON

EXISTING INCLUSION-FOCUSED ACCELERATORS

2Gether-International, a startup accelerator in DC, is run by and for entrepreneurs with disabilities, providing resources, training and opportunities tailored to help founders create businesses. 2Gether-International recently announced a first-of-its-kind tech cohort exclusively focused on advancing opportunities for entrepreneurs with disabilities

in partnership with Google for Startups.

Street Entrepreneurs is a non-profit organization that supports small business founders through a community-driven accelerator that provides entrepreneurs with business education, mentorship and startup capital.

Techstars Washington DC
Powered By J.P. Morgan,
Fall 2022 Cohort
SOURCE: Techstars

TECH ECOSYSTEM NEEDS

INFORMATION NEEDS

- **Better access to information, mentorship, and resources for diverse founders to help them secure funding and grow**

Entrepreneurs of color and female entrepreneurs face significant barriers to fundraising due to implicit bias and lack of relationships with gatekeepers. Racial wealth gaps exacerbate this challenge, making it more difficult for founders of color to raise funds from friends and family.

Expanding accelerators, which support the growth of early-stage companies through education, mentorship and funding, is one way to address this challenge.

In particular, accelerators and programs with a mission of inclusivity would benefit from greater investment.

These organizations—such as Startup Boost, Halcyon, 2Gether-International, Seed Spot—support targeted populations of entrepreneurs by providing education, networking events and accelerator programs.

Some stakeholders also identified the need for more programming that specifically supports Black founders. Supporting and expanding upon the work of organizations like Black Girl Ventures and 1863 Ventures is necessary to decrease the significant fundraising gap between black and white tech entrepreneurs.

Stakeholders also expressed a need for a Black-led and Black-focused physical place to engage with other entrepreneurs, which inclusion-focused accelerators and incubators can provide.

RELATIONSHIP AND GATEKEEPER NEEDS

- **Access to the professional networks that are critical to growing, scaling and bringing visibility to a startup**

Lack of diversity in tech can make it challenging for diverse founders to build professional networks critical to growing, scaling and bringing visibility to a startup, including warm introductions to potential funders and mentors. Building stronger access to informal networks that can open doors to opportunities and connect founders to funding is essential to diverse founders' success. Stakeholders identified this as one of the most important barriers that needs to be addressed in the District's tech ecosystem.

In DC—and nationally—VC investment in Black, brown and women entrepreneurs falls far short of needs. DC, however, has a number of organizations focused on investing in diverse entrepreneurs.

SUCCESSES TO BUILD ON

INVESTING IN DIVERSE FOUNDERS

1863 Ventures is a DC-based national business development non-profit that supports diverse entrepreneurs through a variety of programming and funding. Announced in October 2021, 1863 Ventures administers the City's Inclusive Innovation Equity Impact Fund, with the first round of 16 recipients announced in May 2022. Additional funding from DC government, supported by private fundraising, is anticipated through 2024.

Mayor Bowser at DC Entrepreneur Showcase, WeDC House at SXSW. SOURCE: WDCEP

TECH ECOSYSTEM NEEDS

FUNDING NEEDS

• Equal access to VC funding for founders of color and women

In the Tech Ecosystem Sentiment Survey, 82% of respondents either agreed or strongly agreed that increasing access to capital was critical to increasing diversity in the District's tech ecosystem.

Black founders in particular struggle to raise venture capital. Nationwide, in 2016, Black founders raised $600 million, or 0.8%, of all VC funding. With the onset of the COVID-19 pandemic in 2020, VC funding for Black founders fell by almost 50%, indicating that Black entrepreneurs have greater challenges accessing capital in times of uncertainty. In the first half of 2021, Black founders raised $1.8 billion, two times more than previous years, but their overall share of funding remains only 1.2%.[9]

Below, data on venture investing in DC shows that the District is doing slightly better than other states, though a major gap remains. In the District, 3.5% of VC funding went to Black-founded companies between 2015 to 2020. Notably, this was a greater share than in New York, Masssachusetts or California, although the percentage of DC's Black workforce is also larger.[10]

Stakeholders noted positive efforts in the District, including an increase in the number of funds led by diverse individuals in the region, including Zeal Capital Partners, The Marathon Fund and Impact America Fund.

Women also have difficulty securing capital. The chart below demonstrates that in the US in 2022, $32.4 billion of VC funding was invested in women-founded companies, an increase of $9 billion since 2020. However, this was only 17% of total VC investment in 2022. Women's difficulty in securing funding is partly driven by gatekeeper and relationship barriers. Only 18% of VC investors are women, and 1% are Black women.[11]

VC Funding to Black-Founded Companies vs. Black Workforce 2015–2020

● Share of Total Funding to Black-Founded Companies
● Black Workforce %

	DC	NY	CA	GA	MA
Share of Total Funding	3.5%	3.1%	0.6%	4.9%	0.2%
Black Workforce %	33%	15%	6%	33%	8%

US VC Funding to Women-Founded Companies 2012–2022

● Deal Value ($B)   ● Proportion of Total VC $ Investment

	2012	2014	2016	2018	2020	2022
Deal Value	$5.2B	$9.9B	$10.8B	$20.1B	$23.4B	$32.4B
Proportion	14%	15%	14%	14%	15%	17%
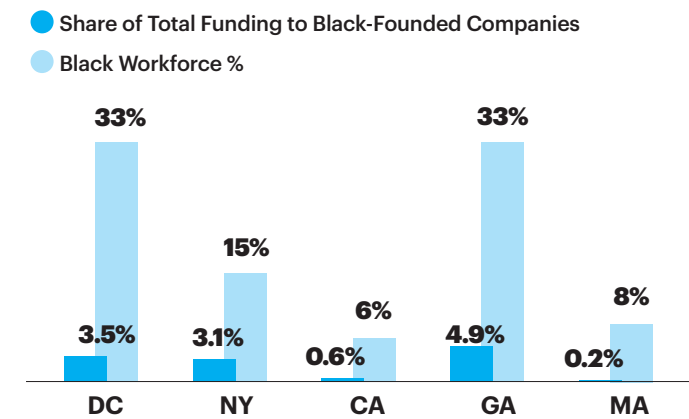
SOURCE: PITCHBOOK, 2022; CRUNCHBASE, 2021.
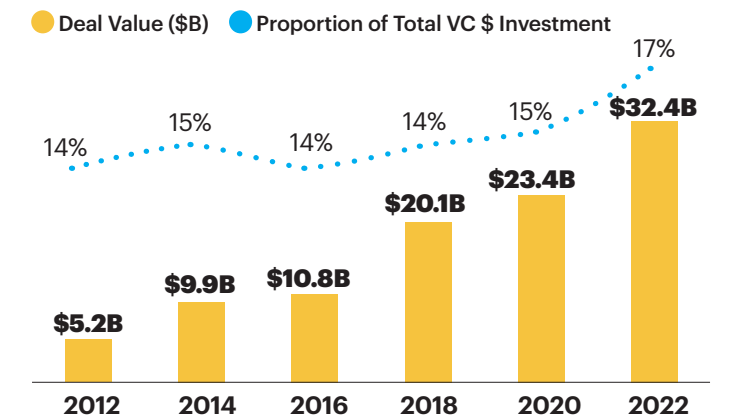
CHALLENGES AND OPPORTUNITIES

CAREER PATHWAYS

Talent, Advancement, Retention

Diverse candidates can struggle to access high-quality jobs in tech, pay equity with their peers and opportunities for advancement in their current organization. Challenges include educational barriers, degree requirements and a lack of transparency in compensation. Some corporations, however, such as Accenture and IBM, are eliminating degree requirements and publishing compensation scales.

SUCCESSES TO BUILD ON

HIRING NON-TRADITIONAL CANDIDATES

Major corporations, including Google, Apple, Bank of America and IBM, have eliminated degree requirements for applicants. Instead, many employers have started to offer bootcamps and other trainings to allow workers to gain hard technical skills without having to attend college. In 2022, the District and Google partnered to train 250 Ward 8 high school students through Google's certificate program for entry-level tech jobs.

DC's Bank on 100 Million Coalition from Mission: Launch, Inc. and the Department of Employment Services hosted the Future Ready Now: DC Hackathon in April 2023 to support employment for returning citizens. During the two-day event, stakeholders, including representatives from the U.S. Department of Labor and other federal agencies, discussed reentry and professional pathways for people who were previously incarcerated.

In DC, the tech ecosystem has higher barriers to entry: 83% of ecosystem jobs require a bachelor's degree, compared to 64% of US tech ecosystem jobs.

TECH ECOSYSTEM NEEDS

INFORMATION NEEDS

- **Decreased reliance on degree requirements that screen out diverse applicants**
- **Greater transparency in private sector salary and equity packages**

Nationally, although 60% of US workers do not have a four-year degree, many tech employers have made it a prerequisite for hiring. In tech, recent studies have found that almost 40% of all IT jobs[12]—a subset of tech ecosystem jobs—can be done without a college degree. While degree requirements remain a barrier for applicants to most tech jobs, some major national companies are removing requirements for tech roles.

In DC, the tech ecosystem has even higher barriers to entry: 83% of ecosystem jobs require a bachelor's degree, as opposed to 64% of US tech ecosystem jobs, as shown on the chart to the right. 60% of DC's population has a bachelor's degree or higher, but only 29% of the Black population and 48% of the Latino population meet this requirement. While women earn college degrees at a higher rate than men, fewer women opt for STEM (science, technology, engineering, and math) degrees than men.[13]

Once diverse candidates get in the door for an interview, however, lack of salary transparency and bias can seriously disadvantage them. Due to lack of representation at high levels, diverse talent may lack mentors who can advise on whether a salary and equity compensation package (i.e., non-cash shares, stocks, or options that represent ownership of the company) is on par with offers to peers. Furthermore, bargaining can impact diverse workers once they enter a role, with

repercussions for how they are treated. Studies indicate women who negotiate are viewed as less likeable and are less likely to get what they seek. Further, negotiating can sometimes backfire for Black candidates. Bargaining by Black professionals has been found to result in lower salaries because of implicit racial biases. In a University of Virginia study, job interviewers who scored high for racial bias penalized Black candidates for negotiating by granting fewer salary concessions as compared to white candidates who negotiated, likely because they believed these candidates should settle for less.[14]

Share of Jobs Requiring a Bachelor's Degree or Higher

DC High-Tech Jobs	95%
DC Tech Ecosystem	83%
DC Workforce	58%
US Tech Ecosystem	64%
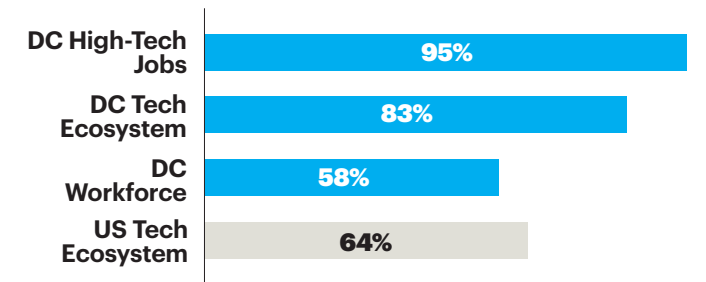
Share of DC Population with a Bachelor's Degree or Higher[15]

Black	29%
Latino	48%
Women	60%
Disabled	28%
All	60%
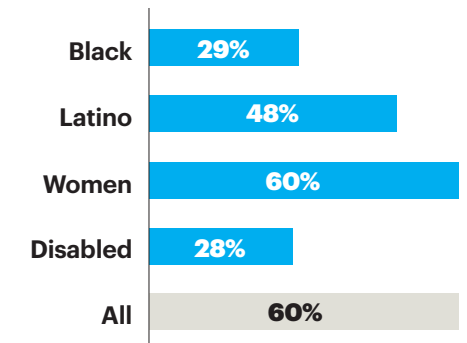
SOURCE: LIGHTCAST, 2022; PUMS, 2021.

Lack of diversity in senior positions and implicit bias prevent Black, Latino and women workers from climbing the career ladder in tech. Yet some private employers and conveners are leading the way in investing in the advancement of diverse talent.

SUCCESSES TO BUILD ON

RESOURCES FOR MANAGERS TO EXPAND INCLUSION AND DIVERSITY

Path for Progress was created by DC-based tech company Quorum to help small-and medium-sized businesses build inclusion and diversity programs. Organizations who sign the pledge to commit to the three-stage process outlined by the program gain access to free resources, events and mentorship opportunities.

BUILDING DIVERSE PROFESSIONAL NETWORKS

Tech, Rebalanced is a local organization that was founded to get more underrepresented genders (women, trans and non-binary folks) into tech and create an inclusive and safe space for this community to convene and build relationships.

TECH ECOSYSTEM NEEDS

RELATIONSHIP AND GATEKEEPER NEEDS

• **More diverse leadership that fosters the career advancement of women and people of color**

Lack of diversity in tech leadership positions, combined with implicit bias, makes it challenging for diverse workers to build professional networks, which are critical to career pathways and offer access to hiring managers, recruiters and mentors. Accordingly, 85% of respondents

to the Tech Ecosystem Sentiment Survey either agreed or strongly agreed that a lack of diverse representation in the leadership positions of local tech employers is a barrier to increasing diversity in the District's tech ecosystem. This barrier also perpetuates implicit bias in workplace culture. Even after diverse talent is hired, cultural and implicit bias in the tech industry can continue to hinder advancement. There is a need for programming to better elevate diverse tech leaders and foster more inclusive corporate cultures in order to pave the way for greater diversity.

DC Tech Ecosystem Sentiment Survey: Actions to Support DEI
Respondents indicated what actions would support more equitable workplaces and career pathways. Those deemed to have the greatest potential impact were changes to company culture and diverse employee retention and recruitment.

● Very impactful   ● Somewhat impactful   ● Not very impactful   ● Not at all impactful

Action	Very impactful	Somewhat impactful	Not very impactful	Not at all impactful
Building company cultures that are truly diverse, equitable and inclusive	82%	17%		1%
Retaining diverse employees	81%	15%		4%
Increasing the diversity of people in leadership positions	72%	23%	3%	2%
Recruiting diverse candidates	72%	23%	5%	
Getting executive leadership buy-in for DEI programs and/or initiatives	63%	22%	12%	3%
Funding DEI programs and/or initiatives	62%	20%	13%	5%
Joining peer network of companies building internal DEI programs/cultures	45%	35%	18%	2%
Example DEI frameworks/ strategies that have worked for similar companies/organizations	42%	44%	9%	5%
Connections to trusted DEI experts/advisors	42%	43%	12%	3%

SOURCE: DC Tech Ecosystem Survey, 2021.

Building on strong models in the region for apprenticeships for diverse workers, increased investment in internships and apprenticeships is needed.

SUCCESSES TO BUILD ON

TECH-FOCUSED APPRENTICESHIPS IN DC

BuildWithin is a software platform that employers can use to accelerate team member productivity utilizing apprenticeships, onboarding, training and upskilling. This DC-based startup also runs its own apprenticeship program to train IT talent and fill employment and skill gaps. Its cohort program is one of the first tech-focused apprenticeship programs to be registered with DC Department of Employment Services.

TECH-FOCUSED INTERNSHIPS IN THE REGION

Capital One hired 700 interns in 2021 for its Technology Internship Program. This internship is a paid, 10-week program in which interns work in a range of roles, including machine learning and mobile and software engineering. In addition to the internship opportunities, Capital One also offers a software training program—Capital One Development Academy—which is for non-computer science majors.

APPRENTICESHIP NETWORK FOR DIGITAL AND PROFESSIONAL SERVICES

The Greater Washington Apprenticeship Network's mission is to help employers in the region explore and develop an apprentice-based model of recruitment and training. With the leadership of Accenture and Aon, the Network aims to create 1,000 new apprenticeships in the region for employees to receive on-the-job training while still earning a living. This commitment could be a launching pad for the District to develop corporate partnerships that create apprenticeships.

73% of Tech Ecosystem Sentiment Survey respondents agreed that lack of commitment to diverse hiring was a barrier to diversity in the tech ecosystem.

TECH ECOSYSTEM NEEDS

FUNDING NEEDS

• Greater investment in internships and apprenticeships for diverse talent

Following the murder of George Floyd and summer of protests in 2020, some major corporations responded with commitments to invest in programs that support racial justice and economic opportunity for Black Americans. From May 25 to Oct. 31, 2020, individual commitments from the top 1,000 US companies nationally included:[16]

• 32% made statements in support of racial justice

• 22% made external commitments to promote equity through economic opportunities (e.g., donations, investments and changes to products/services)

• 18% made commitments to promote diversity and inclusion internally (e.g., requiring diverse candidate pools, increasing spending with Black suppliers)

DC employers can now build upon the execution and coalition building being seen in other cities and regions. For example, the statewide coalition, Washington Employers for Racial Equity, is committed to supporting a racially equitable future and has set specific, transparent goals to reach by 2030. In New York, 27 CEOs launched the New York Jobs CEO Council and committed to hiring 100,000 New Yorkers by 2030, including 25,000 from the City University of New York.

This moment might be leveraged to develop diverse hiring and funding partnerships with corporations— ideally including corporations in the broader region.

Corporations in the region should support diverse career pathways by expanding apprenticeship opportunities, hiring from tech training providers, and developing partnerships with local colleges and universities, such as the University of the District of Columbia (UDC). Apprenticeships are a preferred method for sector-based training since they offer an "earn and learn" model and allow candidates to hone soft skills that are best developed within the workplace. Internships on the other hand are not accessible to everyone given their lack of funding. According to one study, 43% of internships at for-profit companies are unpaid.[17] To minimize financial barriers to these opportunities, investment in paid internships is essential.

SOURCE: iStock.com/dragana991

CHALLENGES AND OPPORTUNITIES

TALENT DEVELOPMENT

Education and Skills Development, Early Exposure and Socialization

The District is actively making investments in digital inclusion, and access to computer science (CS) education in public schools has increased significantly in recent years. Access to tech and early exposure and socialization are critical to ensuring economic opportunity for DC youth.

SUCCESSES TO BUILD ON

GROWING ACCESS TO CS IN THE DISTRICT

Between the 2018–2019 and the 2021–2022 school years, the share of public schools offering CS more than doubled from 20% to 45%.[18] This demonstrates a clear intention by the District to expand CS education, though a citywide commitment could provide further momentum.

Mayor Muriel Bowser kicking off the Empowered Learner's Initiative with students at Van Ness Elementary School. SOURCE: DC Office of the Mayor

TECH ECOSYSTEM NEEDS

INFORMATION NEEDS

• **Increased CS curriculum access, standards and requirements**

• **Expanded opportunities for exposure to tech for underserved populations**

STEM and CS education are essential to preparing students for digital and tech careers. Early exposure to STEM and CS education have been linked with higher rates of college enrollment and improved problem-solving abilities.[19] Furthermore, the skills developed by this education are prerequisites for many well-paying careers beyond tech. CS education is even more impactful in preparing students for the workforce when coupled with access to broadband.

In recognition of the value of CS, the share of DC's public high schools offering CS education in public schools increased from 20% in the 2018-2019 school year to 45% in the 2021-2022 school year. Despite this progress, there are still racial gaps in access to CS education when compared to regional peers, as shown on the chart to the right: 51% of Black DC public school students have access to CS, compared to 91% in Maryland and 81% in Virginia; 67% of DC Latino students have access to CS compared to 92% and 91%, respectively, in those same states.

Available data shows that DC has stronger participation in CS education by female students compared to national trends. Of the 423 exams taken in AP Computer Science by DC high school students in 2020, 41% were taken by

female students, compared to only 31% nationally. The District should build on this momentum and continue efforts to recruit female students to STEM and CS educational programming.[20]

Continued investment in these programs can help to prepare the city's youth for upward mobility. As part of its efforts to expand CS education access, the District should establish district-wide standards and invest in teacher preparation programs. Schools will also require access to devices and internet access to support learning.

Share of DC Students Who Attend a Public School That Teaches CS 2021-2022

● DC ● MD ● VA

	White	Black	Latino	Asian
DC	76%	51%	67%	72%
MD	97%	91%	92%	98%
VA	88%	81%	91%	95%
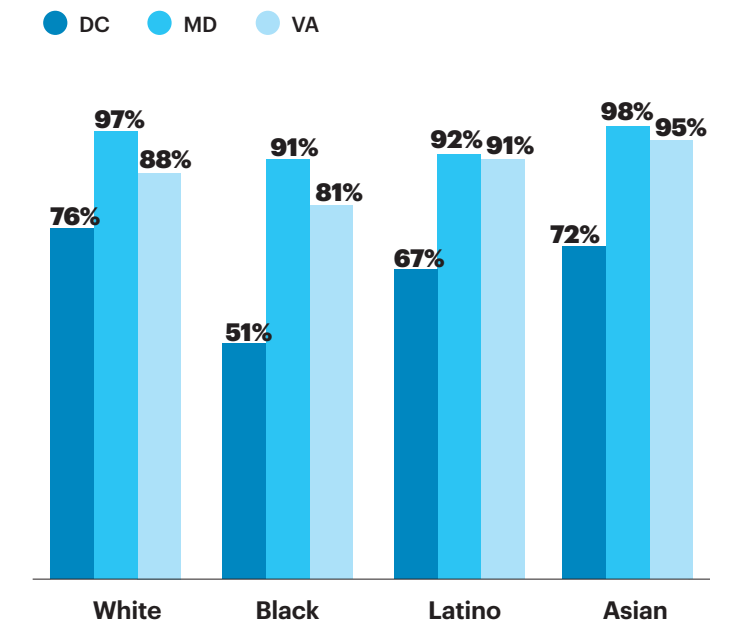
SOURCE: Code.org, 2022.

The DC region is home to several innovative workforce development partnerships. Greater coordination among all the stakeholders in the system could help to scale these successful efforts and strengthen existing assets.

SUCCESSES TO BUILD ON

INNOVATIVE WORKFORCE PARTNERSHIPS

The Greater Washington Partnership's **Capital CoLab**, started in 2018, is a partnership of business and academic institutions to build industry-aligned digital tech pathways that ensure inclusive growth. With the Capital CoLAB Digital Tech Credential (DTC), university students gain the digital skills needed for in-demand tech and tech adjacent jobs in the Capital Region. Students who complete coursework aligned with entry level jobs in Cybersecurity, Data Analytics, Machine Learning, and Generalist (or tech adjacent) roles are awarded a digital badge that employers recognize as a differentiator in the hiring process. Steps like this help the Greater DC area work towards achieving goals, such as "Increase diverse representation in STEM fields," as laid out in the Greater Washington Partnership's Preface Report to the Regional Blueprint for Inclusive Growth.

The **"Talent for Tomorrow Alliance"** is a collaboration of nationally recognized training providers (Year Up, Genesys Works, New Futures, Per Scholas and Capital Partners for Education) designed to close racial income and opportunity gaps. The five non-profit partners have co-located in DC to allow youth and young adults to take training courses in one location and support collaboration, clarity of resources and employer connections. Capitol One has not only invested in the program (along with the A. James and Alice B. Clark Foundation) but has made commitments to host interns and hire graduates.

The University of the District of Columbia (UDC), the only public university in DC and a Historically Black College and University (HBCU), is a major asset for developing talent, offering community college, undergraduate and graduate level courses. UDC offers trainings on a variety of tech skills including CompTIA+, Cloud Computing, and CAPM/Project Management. UDC's Division of Workforce Development and Lifelong Learning (WDLL) provides free training for DC residents in digital and tech skills and is assisting students with finding employment, apprenticeships and internships.

77% of tech ecosystem Sentiment Survey respondents agreed that there was a need for more robust workforce training programs with strong employer partnerships.

TECH ECOSYSTEM NEEDS

RELATIONSHIP AND GATEKEEPER NEEDS

• More robust coordination, collaboration, and connections across workforce development stakeholders

DC's workforce development organizations are critical resources for supporting equitable access to career pathways in tech. Better coordination and collaboration among workforce development stakeholders—including providers, employers, educators and funders—would help to scale the most successful and innovative strategies.

Unlike New York City, San Francisco, or Boston, DC lacks a tech-focused workforce development intermediary. Workforce intermediaries act as a broker between employers and job seekers to build programs that meet employer demands and place workers into jobs successfully. Their activities can build partnerships between stakeholders and ultimately build capacity for the ecosystem as a whole—through leveraging existing public funding streams, advocating, fundraising for private investment and researching trends in the sector. Such networks can help maximize the efforts of individual providers and create equitable access to career pathways in tech.

WeBuild Summit as part of National Apprenticeship Week in November 2022.
SOURCE: BuildWithin

More funding for tech training is needed—and the District is increasingly budgeting for Digital Inclusion initiatives.

SUCCESSES TO BUILD ON

INVESTMENT IN DIGITAL INCLUSION

The District is growing its spending to support a more diverse tech ecosystem: the District's FY 2022 budget included $4.35 million for Digital Inclusion initiatives, representing a $3.96 million increase over the previous fiscal year.

Further, over the next 4 years, DC has the potential to receive at least $120 million in federal funds, from the Bipartisan Infrastructure Law and American Rescue Plan Act, to invest towards that vision. The new State Broadband and Digital Equity Office will coordinate these local and federal investments. Projects include expanding the District-owned network as one way to increase access to high-speed internet for all DC residents.

Participants in Connect.DC, a DC Government digital inclusion program, in 2019.

TECH ECOSYSTEM NEEDS

FUNDING NEEDS

• **Increased funding for digital and tech training**

Research has indicated that sector-based training programs have better outcomes than non-sector specific workforce programs, including higher wages and greater access to jobs offering benefits.[21]

In DC, spending on workforce development more than doubled between 2019 and 2021. However, a portion of the District's workforce development budget remained unspent, highlighting an untapped resource and opportunity to expand participation. DC currently has 15 programs that focus on tech training. Increased funding could help to expand those programs or create new ones to fill training gaps for certain in demand tech skills and occupations.

Additional funding should be accompanied by a requirement for clear outcome metric tracking of participants, hiring and retention. Increased funding to support tech sector-specific training, in partnership with tech employers located in the District, would help support the growth of the local tech ecosystem and connect DC residents to jobs. Further, this would signal to the public, non-profits and the sector more broadly that DC is seeking to expand its homegrown tech talent.

DC Workforce Development Budget 2019–2021

- ● Workforce Program Budget Spent
- ○ Unused Budget

	2019	2020	2021
Total	$131.9M	$123.5M	$119.2M
Unused Budget	$88.1M	$26.2M	$18.7M
Budget Spent	$43.8M	$97.3M	$100.5M
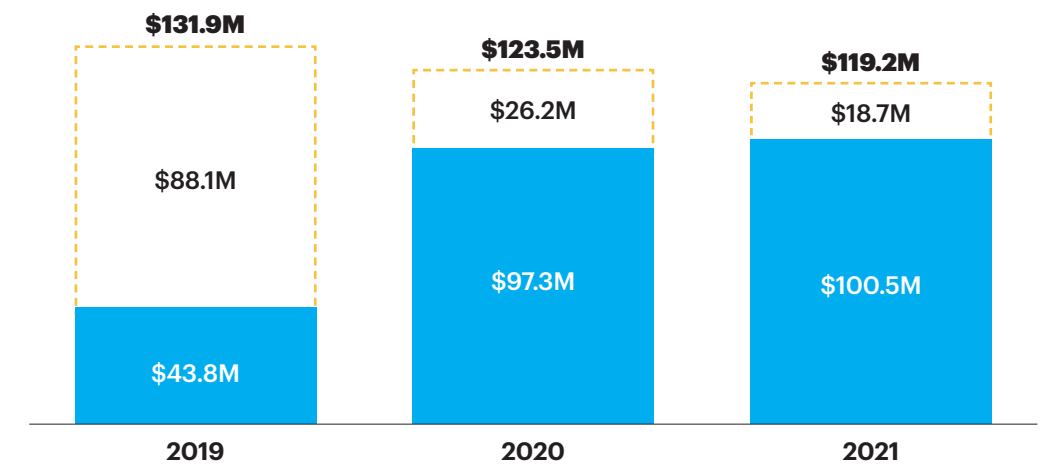
SOURCE: DC Workforce Investment Council, 2022.

DC Startup Week 2022. SOURCE: DCSW

RECOMMENDATIONS

SOURCE: iStock/JLco-Julia Amaral

For Washington, DC to achieve its goal of being an urban center that is a destination of choice for innovators, job creators and diverse workers, public and private stakeholders should come together to invest in policies and programs that foster a more inclusive tech ecosystem.

The following recommendations, based on local needs and national best practices, will build on DC's leadership as a national model of inclusivity.

These recommendations directly address some of the broad ecosystem-wide issues identified by stakeholders: a need for a more cohesive tech ecosystem that can coordinate to advance equity efforts, track transparent success metrics and ensure accountability. The recommendations also address equity needs across the Economic Development Pyramid with respect to New Venture Development, Career Pathways, and Talent Development. These interventions can accelerate

DC's efforts to support diverse learners, employees and entrepreneurs.

These recommendations support and expand upon the priorities and initiatives identified in DC's five-year economic development strategy, the DC Comeback Plan, published in early 2023. Goals in that strategy include creating 35,000 jobs in six high-growth sectors (including tech), increasing the share of minority-owned businesses, eliminating key amenity gaps across all neighborhoods (such as access to high-speed internet) and increasing Black median household income by $25,000.

RECOMMENDATION

1. **Create a tech ecosystem-building organization**

   `ECOSYSTEM-WIDE`

   1a. Advocate for strengthening tech equity in public spending

   `NEW VENTURE DEVELOPMENT`   `CAREER PATHWAYS`   `TALENT DEVELOPMENT`

   1b. Serve as an industry-led, tech-focused workforce development partner

   `CAREER PATHWAYS`   `TALENT DEVELOPMENT`

   1c. Produce a "state of the DC Tech Ecosystem" report

   `ECOSYSTEM-WIDE`

   1d. Develop a strong "DC brand" for tech

   `ECOSYSTEM-WIDE`

2. **Conduct an analysis of K-12 CS and STEM education**

   `TALENT DEVELOPMENT`

3. **Incentivize the creation and expansion of apprenticeship and other certification programs**

   `CAREER PATHWAYS`   `TALENT DEVELOPMENT`

4. **Increase funding to accelerators that support diverse, local founders**

   `NEW VENTURE DEVELOPMENT`

5. **Create a new private-sector led fund to support diverse tech founders**

   `NEW VENTURE DEVELOPMENT`

6. **Co-create and pilot tech-driven civic solutions with local DC communities**

   `NEW VENTURE DEVELOPMENT`   `TALENT DEVELOPMENT`

1. Create a tech ecosystem-building organization

1a. Advocate for strengthening tech equity in public spending

ECOSYSTEM WIDE

Create an organization focused on growing an equitable tech ecosystem by acting as a convener and implementer for tech equity and inclusion initiatives

Unlike other jurisdictions (e.g., TEDCO in Maryland, VIPC in Virginia) and cities (e.g. Tech:NYC), there is no current unified entity that supports DC's tech sector. Creating a dedicated ecosystem-building organization could drive growth and job creation in DC's tech sector by addressing multiple needs identified by this report. Acting as a convener to foster connectivity and networking, the organization could coordinate existing entrepreneur-support organizations and liaise across workforce development efforts. This entity could also create a unified tech sector policy agenda and advocate for public and private spending. The organization could develop and broadcast a DC tech brand and market DC as the nation's leading equity-driven tech ecosystem. Finally, the organization could implement this report's recommendations, track progress transparently and hold the ecosystem accountable for success.

Implementation would occur in a phased approach. The first step would be bringing together stakeholders (e.g., relevant DC government agencies, startups, established firms and entrepreneur support organizations) to discuss goals and governance structure. These conversations should produce a gap analysis, identify a list of activities or programs that the organization should focus on and determine the best structure and steps needed to effectuate the new entity. Stakeholders should also align on metrics for success and identify sustainable funding streams and/or opportunities for private fundraising.

After setting this foundation and establishing the organization, the additional recommended activities outlined in this report could follow, including advocacy, talent training and marketing the DC tech sector. By providing a unified voice, this organization would signal DC's value proposition to corporate, non-profit and philanthropic partners as well as private investors, thereby attracting talent, entrepreneurs and businesses from across the country to locate in DC.

EQUITY NEEDS ADDRESSED

RELATIONSHIP AND GATEKEEPER NEEDS

• A more cohesive tech ecosystem that can coordinate to advance equity efforts

• A stronger DC tech brand

• Regular and coordinated public metric tracking

Advocate for strengthening tech equity in public spending, including in education, broadband and workforce development

NEW VENTURE DEVELOPMENT
CAREER PATHWAYS
TALENT DEVELOPMENT

The new ecosystem-building organization would advocate for funding an equitable tech ecosystem by increasing integration of tech and digital programs into existing public funding streams in relevant categories, such as education, broadband, workforce development and entrepreneur support. It would advocate for diverse tech ecosystem stakeholders–including founders, investors, workforce development providers and educators–with one voice.

Activities	• Advocate on behalf of the entire tech ecosystem to City government to ensure tech equity is prioritized in relevant spending • Engage and coordinate where appropriate with the District's Workforce Investment Council (WIC) to support the deployment of public workforce funds • Coordinate partner organizations to make clear recommendations for public sector investments • Track clear and transparent metrics for success to hold the system accountable-including metrics in this report and/or new metrics to be determined by the ecosystem-building organization
Implementing Organizations	Tech ecosystem-building organization, tech training providers, CBOs, community foundations, education advocates, District government

EQUITY NEEDS ADDRESSED

FUNDING NEEDS

• Increased funding for digital and tech training

• Greater investment in internships and apprenticeships for diverse talent

• Equal access to VC funding for founders of color and women

INFORMATION NEEDS

• Increased CS curriculum access, standards and requirements

CREATE A TECH ECOSYSTEM-BUILDING ORGANIZATION

CREATE A TECH ECOSYSTEM-BUILDING ORGANIZATION

1b. Serve as an industry-led, tech-focused workforce development partner

1c. Launch a comprehensive "State of the DC tech ecosystem" report

CAREER PATHWAYS

TALENT DEVELOPMENT

Serve as an industry-led, tech-focused workforce development intermediary to coordinate, collaborate and build the capacity of the tech training ecosystem

Launch a comprehensive "State of the DC Tech Ecosystem" report to understand ecosystem drivers, strategic advantages, challenges and impacts of the sector on the overall economy

ECOSYSTEM-WIDE

The new tech ecosystem-building organization would bring together ecosystem partners to implement strategies that meet employers' and job seekers' needs. The intermediary would be demand-focused, aligning industry needs with tech training providers. This role would include facilitating partnerships between providers, the District's workforce agencies, employers and CBOs. Building capacity for the ecosystem through fundraising, advocacy and research is also a critical role. The intermediary could also engage small-and medium-sized businesses directly to develop and sustain apprenticeships. By creating transparency in the sector, job seekers would have stronger training, networks and information.

As DC seeks to create a more equitable tech ecosystem, it also must define the drivers, size and future potential of the sector. Understanding the size and impact of tech is crucial for properly targeting investments that grow the ecosystem. A stronger overall tech sector can lead to greater opportunities in higher-paying occupations that are less susceptible to automation—particularly when combined with the education, training and job-placement initiatives this report recommends. A new State of the Tech Ecosystem report could identify the top subsectors for growth, identify DC's comparative advantages and evaluate current tech-focused programs citywide to create policies that would foster and grow the sector. This study should also analyze the tech sector by District Wards and quantify the place-based disparities in access to tech education, career pathways and entrepreneurship opportunities.

EQUITY NEEDS ADDRESSED

RELATIONSHIP AND GATEKEEPER NEEDS

• More robust coordination, collaboration and connections across workforce development stakeholders

FUNDING NEEDS

• Greater investment in internships and apprenticeships for diverse talent

Activities	• Serve as collective voice of industry to inform stakeholders and provide data to make short-, medium- and long-term investments • Convene stakeholders to develop new opportunities and streamline services for talent seeking tech jobs or training • Collaborate with relevant government agencies to align efforts • Identify opportunities to expand and formalize partnerships that align the sector's efforts for training and hiring, which can be a vehicle for pooling resources and fundraising • Ensure small-to medium-sized companies have the resources and support to develop sustainable apprenticeship models
Implementing Organizations	Tech ecosystem-building organization, tech training providers, employers, District government and CBOs

Activities	• Build on analysis in this report and other reports, such as DC's Comeback Plan released in January 2023, to identify strong subsectors that can be key areas of growth and opportunity for DC • Engage stakeholders to further analyze DC's unique niche and strategic advantages • Estimate economic and fiscal impacts of the tech ecosystem • Identify recommendations that can drive sustainable growth for the entire tech sector
Implementing Organizations	Tech ecosystem-building organization, District government, DC public-private alliances

EQUITY NEEDS ADDRESSED

INFORMATION NEEDS

• A stronger DC tech brand

• Lack of public metric tracking

CREATE A TECH ECOSYSTEM-BUILDING ORGANIZATION

1d. Develop a strong 'DC brand' for tech

2. Conduct an analysis of K–12 CS and STEM education

ECOSYSTEM-WIDE

Promote a strong DC brand for tech to attract investment, business and talent as a way to increase opportunities for diverse participants.

Conduct a landscape analysis and feasibility study for the implementation of expanded access to CS and STEM education for all public K–12 students

TALENT DEVELOPMENT

This new tech ecosystem-building organization could identify and promote a clear DC tech brand and niche. For example, it might market DC as the home for civic tech, given the anchoring presence of the federal government. A strong brand would articulate a future vision for the District's tech ecosystem, differentiate DC from other cities and signal DC's value proposition to corporate, non-profit and philanthropic partners and investors. This can help attract talent, entrepreneurs and businesses from across the country to locate in DC. Growth in investment dollars and in tech jobs can, in tandem with intentional efforts to promote equity, increase opportunities for diverse entrepreneurs and workers to participate in the ecosystem. The branding efforts should include promotion of DC's diverse entrepreneurs to increase visibility to investors. This approach would also build on DC's existing brand as being the Capital of Inclusive Innovation, while also giving stakeholders an opportunity to further refine and perfect the brand.

To better understand how to support DC K–12 students and schools with CS and STEM education, DC could conduct a landscape analysis of national best practices as well as a feasibility study to understand the needs in the community and how to implement necessary reforms. Providing equitable access to digital and tech skills is essential for K–12 education, as such skills prepare students for careers not just in technology, but also for many well-paying careers beyond tech. These studies can help provide a better understanding of the funding, resources, timeline and policy changes needed to meet that critical need.

EQUITY NEEDS ADDRESSED

INFORMATION NEEDS

• A stronger DC tech brand

• A more cohesive tech ecosystem that can coordinate to advance equity efforts

Activities	• Convene entrepreneurs, investors and other stakeholders to identify DC tech's strengths and its unique strategic advantages • Assess and leverage existing assets of the District and opportunities to create a new, equitable vision for the tech ecosystem • Develop and promote a new DC tech brand and ensure diverse stakeholders support the brand • Create a marketing campaign that widely shares the District's new brand, working with and highlighting diverse founders
Implementing Organizations	Tech ecosystem-building organization, DC public-private alliances, diverse entrepreneurs

Activities	• Research national best practices in reforms to CS and STEM education in public school systems • Assess needs and identify implementation requirements specific to the DC public school system • Provide teachers and administrators with the tools, training and resources necessary to implement any reforms • Connect with ecosystem partners such as CS4All with resources for providing quality, accessible CS education for all DC students
Implementing Organizations	District government

EQUITY NEEDS ADDRESSED

INFORMATION NEEDS

• Increased CS curriculum access, standards and requirements

• Expanded opportunities for exposure to tech for underserved populations

3. Incentivize the creation and expansion of apprenticeship and other certification programs

4. Increase funding to accelerators that support diverse, local founders

CAREER PATHWAYS

TALENT DEVELOPMENT

Develop a diverse tech talent pipeline by incentivizing the public and private sectors to create and expand tech apprenticeship programs and other innovative workforce development models focused on certifying residents without a college degree

Apprenticeships are a best practice in workforce training that allow talent to earn wages and gain education and experience while creating a pathway to a middle-class job without a four-year degree. Apprenticeships are increasingly used by employers because they are cost-effective, grow a diverse talent pipeline and increase retention. Investments in talent—expanding the skills, knowledge and experience of an individual—can also improve productivity, spur innovation and provide pathways for upward mobility. Apprenticeships also help participants build networks, breaking down information and relationship needs.

EQUITY NEEDS ADDRESSED

INFORMATION NEEDS

- Decreased reliance on degree requirements that screen out diverse applicants
- Greater transparency in private sector salary and equity packages

FUNDING NEEDS

- Greater investment in internships and apprenticeships for diverse talent

Activities	
Activities	• Convene business and education leaders, with the workforce intermediary outlined in Recommendation 1 around a common vision, elevating apprenticeships as a core strategy • Consider a tax incentive or other mechanisms to offset costs of training and encourage apprenticeships • Leverage the District's procurement authority to incentivize contractors to adopt apprenticeships • Expand current public sector apprenticeships • Direct District funding to programs that expand apprenticeship opportunities for DC residents • Promote the availability of District funding, recruitment support and other resources to help tech employers develop certified tech apprenticeship programs
Implementing Organizations	District government, private sector employers

NEW VENTURE DEVELOPMENT

Increase funding for accelerators and incubators that support diverse entrepreneurs with a focus on access to capital and creating inclusive gathering places

Accelerators and incubators address multiple needs—information, relationships and funding—and are essential to supporting diverse entrepreneurs. DC has accelerators that specifically target local, diverse entrepreneurs, including 1863 Ventures, 2Gether-International, and Halcyon. Organizations like these are doing impactful work and would benefit from additional resources to scale their efforts. There is also a need to develop clear, transparent metrics for DC-based accelerators that will help track and demonstrate the growth of their alumni start-ups. While this recommendation calls for programs that serve diverse entrepreneurs overall (including people of color, women, LGBTQIA+ and people with disabilities), it also recommends funding for programming that specifically supports Black DC-based entrepreneurs, which was indentified specifically by many stakeholders.

Activities	
Activities	• Expand funding for accelerators and incubators to allow them to expand and scale their cohorts and activities, especially those that specifically serve underrepresented founders • Develop clear, transparent metrics for accelerators to share publicly that will help demonstrate success over time and justify investment in concert with the new tech ecosystem-building organization identified in Recommendation 1
Implementing Organizations	Philanthropy, investor community, District government, tech ecosystem-building organization

EQUITY NEEDS ADDRESSED

INFORMATION NEEDS

- Better access to information, mentorship and resources for diverse founders to help them secure funding and grow

RELATIONSHIP AND GATEKEEPER NEEDS

- Access to the professional networks that are critical to growing, scaling and bringing visibility to a startup

5. Create a new private-sector led fund to support diverse tech founders

6. Co-create and pilot tech-driven civic solutions with local DC communities

NEW VENTURE DEVELOPMENT

Convene philanthropy, private investors and the public sector to start a private sector investment fund to invest in tech startups led by diverse founders[22]

Empower residents to identify neighborhood concerns and engage with entrepreneurs to co-create tech driven solutions for community-identified challenges[23]

NEW VENTURE DEVELOPMENT

TALENT DEVELOPMENT

Across the country, including in DC, raising capital is an immense challenge for diverse entrepreneurs. Overcoming the funding problem with more leadership from the private sector is essential to creating an inclusive innovation ecosystem. The recently launched Inclusive Innovation Equity Impact Fund, which is administered by 1863 Ventures on behalf of the District, is designed to address the gap in capital for small businesses that would not otherwise receive early-stage funding through conventional financing. To complement this effort and serve businesses ready for the next stage of investment, a new fund focused on the tech sector should be created. This effort should be led by philanthropy and private investors, with the support of the public sector. The fund could work with DC accelerators to identify promising, diverse startups to invest in and grow. It could be managed by a private VC firm, the new ecosystem-building organization, or another non-profit financial organization with venture experience.

Develop a program to empower residents to identify neighborhood concerns and work with entrepreneurs to co-create community-driven solutions using technology. In addition to using their local knowledge to help solve community challenges, residents—both adults and youth—can learn and use tech skills in their communities, helping to build early exposure and socialization to technology and digital literacy. This program could be piloted in neighborhoods with the greatest digital inclusion needs.

Activities	• Create a private-led fund that directly invests in tech startups led by Black, Latino, women, LGBTQIA+ and/ or founders with disabilities • Expand the scale of the fund by raising resources from across sectors • Assign management of the fund to a private financial organization or the new tech ecosystem-building organization • Ensure the fund connects to the DC accelerators supporting local, diverse cohorts of founders
Implementing Organizations	Non-profits, philanthropy, CDFIs, other lenders, District government, tech ecosystem-building organization and/ or VC investors

Activities	• Pilot this concept in neighborhoods with the greatest digital inclusion needs • Convene residents to understand community concerns, partnering with CBOs to empower residents to design and implement solutions • Provide basic digital skills framed as a tool for addressing community concerns • Co-create solutions with residents and entrepreneurs to understand concerns and prototype solutions; test and grow technologies to solve them • Build on programs such as innoMaytion Hackathon, a DMPED-sponsored hackathon held in 2018 that had a focus on increasing the vitality and success of small businesses in the District; the Future Ready Now: DC Hackathon focused on innovation solutions by and for returning citizens; and the resident-centered design programs led by The Lab @ DC
Implementing Organizations	Relevant government agencies, CBOs, a trusted third-party to support data analysis and data-sharing and workforce training providers

EQUITY NEEDS ADDRESSED

FUNDING NEEDS

• Equal access to VC funding for founders of color and women

EQUITY NEEDS ADDRESSED

INFORMATION NEEDS

• Expanded opportunities for exposure to tech for underserved populations

CONCLUSION

Washington, DC has an immense opportunity to leverage its strengths as a diverse city and to become an urban center that is a destination of choice for innovators and job creators who provide access to opportunity for all residents. By highlighting and prioritizing diversity and equity, the District can build on progress to date to ensure that a more diverse array of residents benefit from the learning, employment and entrepreneurial opportunities offered by the tech sector, thereby showcasing to the nation what an inclusive tech ecosystem looks like.

Intentional efforts can remove or minimize barriers for diverse entrepreneurs and talent, including Black, Latino, women, LGBTQIA+ and residents with disabilities.

This work cannot be led by the public sector alone, but will be grounded in partnerships across a robust network of public, private, non-profit, and institutional stakeholders, to ensure a thriving and sustainable DC tech ecosystem.

SOURCE: iStock/LUNAMARINA

APPENDIX

THIS REPORT WAS COMMISSIONED BY:

Office of the Deputy Mayor for Planning and Economic Development (DMPED)

The Office of the Deputy Mayor for Planning and Economic Development (DMPED) assists the Mayor in the coordination, planning, supervision and execution of economic development efforts in the District of Columbia with the goal of creating and preserving affordable housing, creating jobs and increasing tax revenue. DMPED pursues policies and programs that create strong neighborhoods, expand and diversify the local economy, and provide residents with pathways to the middle class.

Washington DC Economic Partnership (WDCEP)

A non-profit, public-private organization, WDCEP works to cultivate the tools, infrastructure, workforce, accessibility and climate needed for DC businesses to flourish. WDCEP serves as the leading resource for doing business in DC.

THIS REPORT WAS PREPARED BY:

HRandA Advisors

HRandA Advisors has over 40 years of experience advising on complex economic development and real estate projects in cities across the world. HRandA's Urban Tech and Innovation Practice works with governments, technology companies, institutions, advocates and developers to leverage the technology and innovation economy to increase economic competitiveness, improve quality of life and broaden economic opportunity in cities. Firm clients include Google, Sidewalk Labs, Airbnb, WeWork, Industry City, CUNY, and the City of New York, as well as innovation districts and research parks across the US.

Rodney Sampson

Rodney Sampson is heralded as the leading pioneer in building diverse, equitable and inclusive technology, startup and venture ecosystems from the ground up. He is respected as a pioneer and innovator of streaming technologies at the start of the 21st century, and was the first Black co-founder of a technology startup to raise millions in venture capital throughout the Southeastern United States. Today, he serves as Chairman and CEO, Opportunity Hub; General Partner, 100 Black Angels and Allies Fund; Venture Partner, Draper Goren Holm; and CEO, Piksel Technology Corporation.

LaToya Thomas

LaToya Thomas is the Principal and Founder of Brick and Story, an urban consultancy practice focused on telling the stories of the built environment and the people who live, work and play within its spaces. In finding creative ways to tell these stories, Brick and Story provides engagement strategy and implementation, creative storytelling strategy, and planning and project management to government agencies, non-profit organizations and individuals working or participating in the built environment.

DEFINITIONS[24]

Accessibility

Accessibility means the design, construction, development and maintenance of facilities, information and communication technology, programs and services so that all people, including people with disabilities, can fully and independently use them.

Computer science (CS)

Computer science (CS) is the study of both computer hardware and software design, including theoretical algorithms, artificial intelligence and programming.

Digital divide

The gap between communities that have equitable access and use of digital literacy training, the Internet and Internet-connected devices and those who don't.

Digital equity

Digital equity is when everyone has access and use of digital literacy training, the Internet and Internet-connected devices to be successful in society, democracy and the economy regardless of their background, neighborhood or identity.

Diversity, equity and inclusion (DEI)

Diversity is the representation of all individuals, collective identities and differences (e.g., race, ethnicity, gender, disability, sexual orientation, etc.). Equity seeks to ensure fair treatment, equality of opportunity and fairness in access to information and resources for all. Inclusion builds a culture of belonging by actively inviting the contribution and participation of all people.

Digital inclusion

Digital inclusion means proactively ensuring everyone has access and use of digital literacy training, the Internet, Internet-connected devices and other digital inclusion resources and services.

Latino

A person of Latin American origin or descent.

LGBTQIA+

An abbreviation for lesbian, gay, bisexual, transgender, queer, intersex, and asexual communities. This term is often meant to refer to a full community of queer-and trans-spectrum identities, not just those that are listed.

People with disabilities

People with disabilities include anyone indicating a hearing, vision, cognitive, ambulatory, self-care or independent living difficulty.

Science, technology, engineering and math (STEM)

STEM skills and knowledge help students develop logic, problem solving and critical thinking skills that can be used in every discipline and that enable them to compete in the continually growing high-tech job sector.

Tech ecosystem

A tech ecosystem is a network of interconnected, physically proximate firms and institutions related to tech or with jobs that rely on tech and require tech talent—combined with enabling organizations such as investors, workforce training providers and entrepreneurial support groups.

Venture capital (VC)

A form of financing that investors aim towards start-ups and entrepreneurs that they believe have long-term growth potential, often in exchange for equity.

Women

People who self-identify as women.

SOURCE: Ford Foundation; White House; OSSE; Brookings; University of Connecticut Rainbow Center; Oxford Dictionary; OCTO.

UPDATES ON RECOMMENDATIONS IN THE 2016 PATHWAYS TO INCLUSION REPORT

The table below includes each recommendation from the 2016 Pathways to Inclusion report and an update on current status.

I. Foundation: Provide the groundwork to participate in the innovation economy		
1. Expand programs to offer low-cost computers to low-income residents	Ongoing	Creation of the State Broadband and Digital Equity Office (OCTO)
2. Partner with internet service providers to offer affordable, high speed broadband access to the district	Ongoing	Creation of the State Broadband and Digital Equity Office (OCTO); Tech Together partnership; DC Community Internet Program
3. Introduce mandatory computer science and related STEM curricula for young children	Started	The share of DC's public high schools offering CS education in public schools increased from 20% in the 2018-2019 school year to 45% in the 2021-2022 school year; 2023 Pathways to Inclusion Tech Equity report recommends conducting an analysis of K–12 CS and STEM education
4. Improve the quality of job training courses to meet employer standards	Ongoing	Talent for Tomorrow Alliance (nationally recognized tech-training providers collaboration); UDC sectoral and certification efforts with corporate partners such as Xcelerate Solutions; Capital One Developer Academy
5. Support coding training and job experience for underrepresented people	Ongoing	BuildWithin IT apprenticeship cohorts; Greater Washington Apprentice Network

II. Capacity: Develop opportunities for education and workforce development		
6. Support entrepreneurship and job training organizations seeking to work with persons with disabilities	Ongoing	2019 DMPED Inclusive Innovation Accelerator grant program funded 2gether International's first incubator program; the program now runs multiple cohorts a year
7. Offer unique and impactful professional development opportunities to STEM teachers	Started	2023 Pathways to Inclusion report recommends conducting an analysis of K–12 CS and STEM education
8. Launch an 'Adopt a School' program	Ongoing	Currently two tech partners: JMA Solutions at Amidon-Bowen Elementary School and Deloitte at McKinley Technology High School
9. Launch a Tech Hire program for returning citizens	Completed	Completed; DOES and DC's Bank on 100 Million Coalition are holding the Future Ready Now: DC Hackathon in April 2023 to support employment for returning citizens

10. Expand tech firm participation in the Summer Youth Employment Program	Ongoing	Summer Youth Employment Program includes technology and IT fields
11. Launch program to connect local tech employers and universities	Ongoing	Greater Washington Partnership Capital CoLab

III. Capital: Expand access to human, social and financial capital		
12. Create an inclusive hub for underrepresented entrepreneurs to launch and grow companies	Started	2019 DMPED Inclusive Innovation Accelerator grant program funded three accelerator programs that served diverse founders; 2023 Pathways to Inclusion report recommends increasing funding to accelerators that support diverse, local founders
13. Support physical infrastructure needs of entrepreneurs	Started	Creation of the State Broadband and Digital Equity Office (OCTO)
14. Support and fund a robust capital program for underrepresented people	Ongoing	DC's Inclusive Innovation Equity Impact Fund, administered by 1863 Ventures
15. Connect diverse entrepreneurial ecosystems	Ongoing	DC Startup Week; Tech, Rebalanced

IV. Awareness: Develop initiatives that highlight the ecosystem's diversity		
16. Create a marketing strategy that spotlights successful diverse entrepreneurs and STEM professionals	Ongoing	WeDC at SXSW
17. Build a suite of resources for companies at all stages of development	Ongoing	ObviouslyDC.com; DC Business Toolkit
18. Foster opportunity for diverse STEM professionals through blind, merit-based hiring that would reduce implicit bias	Started	2023 Pathways to Inclusion report recommends incentivizing the creation and expansion of apprenticeship programs to allow for greater access for diverse workers to tech jobs
19. Encourage inclusive hiring among DC contractors, including subcontractors/ CBEs that participate in inclusive job training programs	Started	Mayor Bowser announced FY23 SBE spending goal of $1.16 billion; DC Green Book: Small Business Opportunity Guide, which is online, searchable and interactive; allows small and local businesses to identify local government opportunities; DMPED released the District's first ever Disparity Study in April 2023

SUMMARY OF STAKEHOLDER ENGAGEMENT

In-Depth Interviews:	18 participants
Focus Groups:	42 participants
	• Talent Development (education and skills development; early exposure and socialization)
	• Talent (hiring, retention and advancement)
	• New Venture Development (innovation, entrepreneurship and market capital)
	• Innovation and Technology Inclusion Council (ITIC)
	• DC tech employers
Written Responses:	7 participants
Tech Ecosystem Sentiment Survey:	72 tech professional respondents

TECH ECOSYSTEM INDUSTRIES

The following industries were used to define the tech ecosystem in DC. These industries were used to define tech in tech and non-tech in tech jobs.

NAICS	DESCRIPTION
3341	Computer and Peripheral Equipment Manufacturing
3342	Communications Equipment Manufacturing
3344	Semiconductor and Other Electronic Component Manufacturing
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing
3364	Aerospace Product and Parts Manufacturing
4541	Electronic Shopping and Mail-Order Houses
5112	Software Publishers
5173	Wired and Wireless Telecommunications Carriers
5174	Satellite Telecommunications
5179	Other Telecommunications
5182	Data Processing, Hosting, and Related Services
5191	Other Information Services
5415	Computer Systems Design and Related Services
5417	Scientific Research and Development Services

SOURCE: BLS, 2021; EMSI, 2021.

TECH ECOSYSTEM OCCUPATIONS

The tech ecosystem includes the following tech occupations, which are present in both tech and non-tech industries. These occupations include:

Bolded occupations: high-tech occupations that are at the forefront of tech innovation and require highly technical skills, including knowledge of coding languages and network architecture, as well as a bachelor's degree.

Unbolded occupations: additional occupations that require less specialized tech-related skills.

SOCS	DESCRIPTION
11-3021	**Computer and Information Systems Managers**
15-1211	**Computer Systems Analysts**
15-1245	**Database Administrators and Architects**
15-1251	**Computer Programmers**
15-1256	**Software Developers and Software Quality Assurance Analysts and Testers**
15-1257	**Web Developers and Digital Interface Designers**
15-1212	**Information Security Analysts**
15-1231	**Computer Network Support Specialists**
15-1241	**Computer Network Architects**
15-1244	**Network and Computer Systems Administrators**
15-1221	**Computer and Information Research Scientists**
15-1232	**Computer User Support Specialists**
15-1299	**Computer Occupations, All Other**
15-2031	Operations Research Analysts
15-2041	Statisticians
17-1021	Cartographers and Photogrammetrists
17-2011	Aerospace Engineers
17-2031	Bioengineers and Biomedical Engineers
17-2041	Chemical Engineers
17-2061	Computer Hardware Engineers

SOCS	DESCRIPTION
17-2071	Electrical Engineers
17-2072	Electronics Engineers, Except Computer
17-2112	Industrial Engineers
17-3012	Electrical and Electronics Drafters
17-3021	Aerospace Engineering and Operations Technologists and Technicians
17-3023	Electrical and Electronic Engineering Technologists and Technicians
17-3024	Electro-Mechanical and Mechatronics Technologists and Technicians
17-3026	Industrial Engineering Technologists and Technicians
27-4011	Audio and Video Technicians
27-4012	Broadcast Technicians
27-4014	Sound Engineering Technicians
27-4032	Film and Video Editors
29-2018	Clinical Laboratory Technologists and Technicians
29-2031	Cardiovascular Technologists and Technicians
29-2032	Diagnostic Medical Sonographers
29-2033	Nuclear Medicine Technologists
29-2034	Radiologic Technologists and Technicians
29-2035	Magnetic Resonance Imaging Technologists
29-2055	Surgical Technologists
41-9031	Sales Engineers
49-2011	Computer, Automated Teller, and Office Machine Repairers
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers
49-2091	Avionics Technicians
49-2093	Electrical and Electronics Installers and Repairers, Transportation Equipment
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay
49-2096	Electronic Equipment Installers and Repairers, Motor Vehicles
49-2097	Audiovisual Equipment Installers and Repairers

SOURCE: BLS, 2021; EMSI, 2021.

Endnotes

1. Crunchbase, *2020 Crunchbase Diversity Spotlight Report*, 2021; Pitchbook, *Q3 NCVA Venture Monitor Summary*, 2022.
2. Crunchbase, *2020 Crunchbase Diversity Spotlight Report,* 2021.
3. The Economic Development Pyramid is a framework for economic development efforts grounded DEI. From the top downward, its components include: (1) Wealth and Job Creation; (2) New Venture Development: Innovation, Entrepreneurship, Market Capital; (3) Career Pathways: Talent, Advancement, Retention; (4) Talent Development: Education and Skills Development, Early Exposure and Socialization."
4. "Other" includes Manufacturing; Management of Companies and Enterprises; Administrative and Support and Waste Management and Remediation Services; Wholesale Trade; Educational Services; Other Services; Retail Trade; Construction; Utilities; Transportation and Warehousing; Arts, Entertainment, and Recreation; Mining, Quarrying, and Oil and Gas Extraction; Accommodation and Food Services; Unclassified Industry; and Agriculture, Forestry, Fishing and Hunting.
5. The Tech Tribune, *2022 Best Tech Startups in Washington, D.C.*, 2021.
6. In DC, and across the US, "two or more races" demographic grew by 12% in the past decade, partially due to changes in how the Census asks about race and ethnicity.
7. While there were 79 respondents to this survey, 7 of the respondents neither worked nor lived in the District and were removed from the sentiment outcomes.
8. Deloitte, "Broadband for all: charting a path to economic growth," 2021.
9. Crunchbase, *2020 Crunchbase Diversity Spotlight Report*, 2021.
10. Crunchbase, *2020 Crunchbase Diversity Spotlight Report*, 2021.
11. Pitchbook, *Q3 NCVA Venture Monitor Summary*, 2022; Kirby, *Where Did you Go to School?*, 2018.
12. CNBC, *The future of work won't be about college degrees, it will be about job skills*, 2018.
13. PUMS, 2019.
14. Harvard Law, *Counteracting Negotiation Biases Like Race and Gender in the Workplace*, 2022.
15. Data on educational attainment for LGBTIA+ DC residents is not available.
16. McKinsey, *When it comes to racial equity, some Fortune 1000 companies are walking the walk*, 2020.
17. Washington Post, *43 percent of internships at for-profit companies don't pay. This man is helping to change that.*, 2019.
18. Code.org Advocacy Coalition, *State of CS in Education*, 2022.
19. Brown and Brown, The Effect of Advanced Placement Computer Science Course Taking on College Enrollment, 2020; Salehi et al., Can Majoring in Computer Science Improve General Problem-solving Skills?, 2020.
20. Code.org Advocacy Coalition, *State of CS in Education*, 2020.
21. Center for American Progress, *Quality Workforce Partnerships: Strategies to create a More Equitable Workforce*, 2020. Aspen Institute, Aligning Talent and Opportunity, 2017; New America, *Growing Equity and Diversity through Apprenticeships*, 2021; Third Way, 2021.
22. Lindy Boggs National Center for Community Literacy, *Beyond Single Interests: Broad-Based Organizing as a Vehicle for Promoting Adult Literacy*, 2022.racia
23. Lindy Boggs National Center for Community Literacy, *Beyond Single Interests: Broad-Based Organizing as a Vehicle for Promoting Adult Literacy*, 2022.
24. Ford Foundation, *Disability Inclusion Toolkit*, 2022; White House, *FACT SHEET: President Biden and Vice President Harris Reduce High-Speed Internet Costs for Millions of Americans*, 2022; OSSE, *Computer Science Standards*, 2022; Brookings, *Can we better define what we mean by closing the digital divide?*, 2022; University of Connecticut Rainbow Center, *The University of Connecticut Rainbow Center's LGBTQIA+ Dictionary*, 2022; Oxford Dictionary, 2022; OCTO, Tech Together, 2022.

2023 PATHWAYS TO INCLUSION

Tech Equity in the District of Columbia

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