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Committee on Energy & Commerce
Subcommittee on Communications and Technology

Hearing on "Leveraging AI to Enhance American Communications"

November 14, 2023

Chair Latta, Ranking Member Matsui, and distinguished members of the House Energy &

Commerce Subcommittee on Communications and Technology, I want to thank you for the invitation to

testify on the important issue of how we can leverage artificial intelligence (AI) to enhance

communications and infrastructure nationwide. I am Nicol Turner Lee, Senior Fellow in Governance

Studies, and Director of the Center for Technology Innovation at the Brookings Institution. With a history

of over 100 years, Brookings is committed to evidence-based, nonpartisan research in a range of focus

areas. My research expertise encompasses data collection and analysis around regulatory and legislative

policies that govern telecommunications and high-tech industries, along with the impacts of digital

exclusion, artificial intelligence, and machine-learning algorithms on vulnerable populations. My

forthcoming book, *Digitally Invisible: How the Internet Is Creating the New Underclass*, will be published

by Brookings Press next spring, and explores in detail the U.S. digital divide.

I.   Introduction

The state of the communications infrastructure in the United States has been important to the

Biden-Harris administration and to this Congress, including the expansion of access to high-speed

broadband networks for all. This work is especially urgent after the COVID-19 pandemic demonstrated

the importance of being connected to the internet for critical services, including health care, education,

employment, remote work, and government services. Given the centrality of the internet to so much of

our lives, it is imperative that we enhance our nation's communications infrastructure, and do so in ways that promote equity and close the digital divide. Having "affordable, reliable, high-speed internet access," as well as equipment, digital skills, and financial resources, is a gamechanger, and for those without those things, it is an adverse determinant of their economic prosperity and quality of life.[1] As of May 2023, 8.3 million homes and businesses lacked access to high-speed broadband.[2] Consequently, life becomes more difficult to navigate as former activities that used to be done over analog communications are no longer easily available to everyday people, and the modern gateway to advanced communications systems requires broadband service, an internet-enabled device, and some type of general literacy on available digital resources.

In my testimony today, I address how artificial intelligence (AI) is being used to enhance American communications by suggesting that with the largest-ever, federal investment in high-speed broadband networks, we should be able to close the digital divide and do so in ways that AI helps to strengthen American communities through smart innovation, the delivery of government services, and the ability of users to fully engage in our democracy. However, the effectiveness of AI in these areas will be dependent on how digital infrastructure is used to protect the public interest from individual and community biases that can potentially under-value the importance of robust communications infrastructure in certain urban and rural communities, violate user privacy, and operate out of alignment with current calls for guidance, including those proposed through the White House Executive Order on AI. Considering that AI can either promote equity or contribute to exacerbate existing systemic inequalities, it is imperative that we consider its role in effectively redressing the digital divide or

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[1] Nicol Turner Lee, James Seddon, Brooke Tanner, and Samantha Lai, "Why the federal government needs to step up efforts to close the rural broadband divide," *Brookings*, October 4, 2022 https://www.brookings.edu/articles/why-the-federal-government-needs-to-step-up-their-efforts-to-close-the-rural-broadband-divide/

[2] David Shepardson, "US agency says 8.3 million homes, businesses lack access to high-speed broadband," *Reuters*, May 30, 2023 https://www.reuters.com/world/us/us-agency-says-83-million-homes-businesses-lack-access-high-speed-broadband-2023-05-30/

worsening the availability of communications if AI is integrated into decision making systems without accountability and oversight, which could spread more misinformation or disqualify communities from transformative innovation based on algorithmic suggestions.

II.   The digital divide and the use of AI are connected ideas

The Infrastructure Investment and Jobs Act (IIJA) of 2021 is a monumental investment of $1 trillion into our nation's infrastructure and vital to ensuring equal access for all. The IIJA's $65 billion toward expanding broadband access and closing the digital divide is the largest-ever federal investment in broadband expansion—$42.5 billion of which is directed through the Broadband Equity, Access, and Deployment (BEAD) Program.[3] In June, the National Telecommunications and Information Administration (NTIA) at the U.S. Department of Commerce announced the distribution of the BEAD funds to every U.S. state and territory, with every state guaranteed a minimum of $107 million.[4] NTIA, who is the federal agency in charge of the program, has directed states to develop and submit their Five-Year Action Plan proposals, which are becoming available on the NTIA's Internet for All website for public comment.[5]

BEAD program funds are also allocated to the Tribal Broadband Connectivity Program, which received $3 billion toward grants for high-speed internet deployment on Tribal lands. [6] The USDA's

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[3] "Broadband Equity Access and Deployment Program," BroadbandUSA [Accessed November 11, 2023] https://broadbandusa.ntia.doc.gov/funding-programs/broadband-equity-access-and-deployment-bead-program
[4] "Fact Sheet: Biden-Harris Administration Announces Over $40 Billion to Connect Everyone in America to Affordable, Reliable, High-Speed Internet," The White House, June 26, 2023 https://www.whitehouse.gov/briefing-room/statements-releases/2023/06/26/fact-sheet-biden-harris-administration-announces-over-40-billion-to-connect-everyone-in-america-to-affordable-reliable-high-speed-internet/
[5] "Timeline: Broadband Equity Access and Deployment," BroadbandUSA [Accessed November 11, 2023] https://broadbandusa.ntia.doc.gov/funding-programs/broadband-equity-access-and-deployment-bead-program/timeline
[6] "Fact Sheet: Biden-Harris Administration Announces Over $40 Billion to Connect Everyone in America to Affordable, Reliable, High-Speed Internet," The White House, June 26, 2023 https://www.whitehouse.gov/briefing-room/statements-releases/2023/06/26/fact-sheet-biden-harris-administration-announces-over-40-billion-to-connect-everyone-in-america-to-affordable-reliable-high-speed-internet/; "Tribal Broadband Connectivity Program," BroadbandUSA [Accessed November 11, 2023] https://broadbandusa.ntia.doc.gov/funding-programs/tribal-broadband-connectivity; "ReConnect Loan and Grant Program," U.S. Department of Agriculture

ReConnect Program received an additional $2 billion toward expanding high-speed internet

infrastructure in rural areas, and the Middle Mile Program was allocated $1 billion in funding for the

"middle mile" internet expansion—the backbone of broadband infrastructure.[7] Another element of

BEAD funding includes Digital Equity Act which will grant $2.75 billion to three programs that promote

digital equity and inclusion.[8]

      The BEAD program is not the only important initiative aimed at closing the digital divide. The

$14.2 billion Affordable Connectivity Program (ACP), which is administered by the Federal

Communications Commission (FCC) and whose funds are also appropriated from the IIJA, provides

crucial subsidies for eligible households to purchase internet access and an internet-connected device,

although the funds for this program are projected to run out by the middle of 2024. The White House

recently requested an additional $6 billon from Congress for the ACP as part of the Biden

administration's supplemental budget request for critical domestic activities.[9] In a recent blog, my

colleague, Jack Malamud, and I have suggested the reauthorization of the FCC's spectrum auction

authority to redirect some of the revenue proceeds to fully fund the program. [10]

      The proliferation of artificial intelligence carries both enormous potential and risk. Prudent AI

implementation can help keep our cities green, improve public transportation, make public services

more accessible for everyone, and help close the digital divide. However, we must also be careful to

mitigate the serious concerns of bias and privacy violations that this technology can bring, and that are

[Accessed November 11, 2023] https://www.usda.gov/reconnect; "Enabling Middle Mile Broadband Infrastructure Program," BroadbandUSA [Accessed November 11, 2023] https://broadbandusa.ntia.doc.gov/funding-programs/enabling-middle-mile-broadband-infrastructure-program; "Digital Equity Act Programs," BroadbandUSA [Accessed November 11, 2023] https://broadbandusa.ntia.doc.gov/funding-programs/digital-equity-act-programs

[7] Ibid

[8] Ibid

[9] Julia King, "Biden asks Congress to throw $6B lifeline to Affordable Connectivity Program," *Fierce Telecom*, October 26, 2023 https://www.fiercetelecom.com/broadband/biden-asks-congress-throw-6b-lifeline-acp

[10] Nicol Turner Lee and Jack Malamud, "Reinstating the FCC's auction authority could save the Affordable Connectivity Program," *Brookings*, August 31, 2023 https://www.brookings.edu/articles/reinstating-the-fccs-auction-authority-could-save-the-affordable-connectivity-program/

disproportionately felt by marginalized communities. We are already seeing the consequences of

algorithmic bias and a lack of transparency around the use of AI. This is an urgent moment that calls for

clear federal guidance and legislation.

III.   The advancement of artificial intelligence (AI)

While the nation is focused on expanding access to high-speed broadband, AI is being

incorporated into countless facets of daily life, and its ubiquity in use is only increasing among the public

and private sectors. For consumers, AI algorithms make determinations about what posts we see on

social media or through targeted advertising, recommend the movies that we watch, facilitate college

admission, diagnose diseases, and determine treatments, facilitate eligibility for financial investments

and loans, assist in the hiring and retention of employees, and have been used in the criminal justice

system to deploy police officers, conduct surveillance, investigate crimes, and determine criminal

sentences.[11] Among organizations, AI is being used to improve and optimizing the wireless capabilities of

5G technologies and deploying tools in traffic and congestion management over advanced

communications systems.[12]

The topic of AI has fueled an increased interest in Congress, among state and city council

legislatures, as well for regulatory agencies and civil society organizations in the United States and

abroad. To date, Congress has held multiple hearings on various issues that intersect with AI and U.S.

Senator Chuck Schumer has hosted six closed-door "AI Insight Forums" that have covered a range of

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[11] Jess Weatherbed, "Meta explains how AI influences what we see on Facebook and Instagram," *The Verge*, June 29, 2023 https://www.theverge.com/2023/6/29/23778068/meta-facebook-instagram-social-media-algorithms-ai-transparency; Netflix Research, "Machine Learning" [Accessed November 12, 2023] https://research.netflix.com/research-area/machine-learning; Kanadpriya Basu, Ritwik Sinha, Ajhui Ong, and Treena Basu, "Artificial Intelligence: How is It Changing Medical Sciences and Its Future?" *Indian Journal of Dermatology*, 2020 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7640807/; Molly Callahan, "Algorithms Were Supposed to Reduce Bias in Criminal Justice—Do They?" *The Brink – Boston University*, February 23, 2023 https://www.bu.edu/articles/2023/do-algorithms-reduce-bias-in-criminal-justice/
[12] Ericsson, "Employing AI techniques to enhance returns on 5G network investments," [Accessed November 13] 2023 https://www.ericsson.com/4ac65f/assets/local/ai-and-automation/docs/machine-learning-and-ai-aw-screen.pdf

issues from privacy to national security. [13] Federal agencies, such as the Food and Drug Administration,

Equal Opportunity and Employment Commission, the Federal Trade Commission have drafted guidance

on the use of AI for the companies under their respective jurisdiction.[14] Last month, the White House

released a sweeping executive order on the development and use of artificial intelligence, or the

Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence,

which followed up on their prior National Blueprint for an AI Bill of Rights.[15] The White House EO was

followed by draft guidance published for public comment from the Office of Management and Budget

(OMB) that is working to ensure safety, and security when used by federal agencies.[16] In many ways,

these current consultations are influenced by the AI Risk Management framework proposed by the

National Institute of Standards and Technology (NIST) earlier this year. Added to these flurries of

[13] David Shepardson, "Congress to hold new AI hearings as it works to craft safeguards," *Reuters*, September 8, 2023 https://www.reuters.com/technology/us-senate-panel-hold-ai-hearing-with-microsoft-nvidia-2023-09-08/; Gabby Miller, "US Senate AI 'Insight Forum' Tracker," *Tech Policy Press*, November 8, 2023 https://techpolicy.press/us-senate-ai-insight-forum-tracker/; Ferdous Al-Faruque, "FDA draft guidance allows AI/ML devices to evolve without requiring new submissions," *Regulatory Focus*, March 31, 2023 https://www.raps.org/News-and-Articles/News-Articles/2023/3/FDA-draft-guidance-allows-AIML-devices-to-evolve-w; Natasha Allen and Louis Lehot, "FTC Issues Guidance on AI-Powered Products," Foley & Lardner LLP, March 16, 2023 https://www.foley.com/en/insights/publications/2023/03/ftc-issues-guidance-ai-powered-products; Joseph R. Biden, Executive 14110: Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence," October 30, 2023 https://www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence/
[14] Michael Atleson, "Keep your AI claims in check," *Federal Trade Commission*, February 27, 2023 https://www.ftc.gov/business-guidance/blog/2023/02/keep-your-ai-claims-check; Food and Drug Administration, "Marketing Submisison Recommendations for a Predetermined Change Control Plan for Aritficial Intelligence/Machine Learning (AI/ML)-Enabled Device Software Functions," April 2023 https://www.fda.gov/regulatory-information/search-fda-guidance-documents/marketing-submission-recommendations-predetermined-change-control-plan-artificial; U.S. Equal Employment Opportunity Commission, "Select Issues: Assessing Adverse Impact in Software, Algorithms, and Artificial Intelligence Used in Employment Selection Procedures Under Title VII of the Civil Rights Act of 1964," May 18, 2023 https://www.eeoc.gov/laws/guidance/select-issues-assessing-adverse-impact-software-algorithms-and-artificial
[15] Joseph R. Biden, Executive 14110: Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence," October 30, 2023 https://www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence/
[16] Shalanda D. Young, "Proposed Memorandum for the Heads of Executive Departments and Agencies," Executive Office of the President: Office of Management and Budget, November 1, 2023 https://www.whitehouse.gov/wp-content/uploads/2023/11/AI-in-Government-Memo-draft-for-public-review.pdf

activities are also the voluntary commitments of a plethora of private sector companies who pledge to responsibly develop and deploy AI systems, and a new attention to "frontier AI models" that can undermine the public interest and public safety if left unchecked, including generative AI and it's known ability to embolden deep fakes and extract voice, image, and text for hyper-exploitation.

This month, the United Kingdom hosted a global summit on AI safety that welcomed the comments of Vice President Harris as part of the broader negotiation of the European Union's introduction and expansion of its proposed AI Act, which would be the world's first comprehensive AI law.[17]

IV.   AI and the nation's communications infrastructure

Much of the conversation in the public domain has been on AI and the public interest, and little attention has been focused on its use in motivating the design and deployment of civic communications infrastructure, including AI in smart city innovation, government, and consumer engagement.

A.   Smart City Innovation

The transformation of cities throughout the world has been a core goal of local and state legislators. I recently returned from the Smart City Expo World Congress 2023 in Barcelona, and there on the exposition floor were transformative demonstrations from across the world, including the deployment of miniscule Internet of Things (IOT) sensors to detect climate concerns, AI-enabled public transportation systems, and state-of-the-art intelligence insights for cities interested in analyzing a range of topics from pollution to public safety. Whereas the prior focus on smart cities primarily evolved around prior generations of IOT and other ways to systemize connections, modern-day AI is combining data analytics, high-speed processing, and more enhanced communications technologies, including

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[17] Adam Satariano and Megan Specia, "Global Leaders Warn A.I. Could Cause 'Catastrophic' Harm," *The New York Times*, November 1, 2023 https://www.nytimes.com/2023/11/01/world/europe/uk-ai-summit-sunak.html; Lisa O'Carroll, "EU 'in touching distance' of world's first laws regulating artificial intelligence," *The Guardian*, October 24, 2023 https://www.theguardian.com/technology/2023/oct/24/eu-touching-distance-world-first-law-regulating-artificial-intelligence-dragos-tudorache

video and audio, to improve the quality of life of residents, and deeply advantage the sophistication of machine learning algorithms, and other predictive and curated AI systems, including generative AI – which carry risk. One example is the work being done by researchers at MIT and the Amsterdam Institute for Advanced Metropolitan Solutions, who are working to develop a fleet of autonomous floating vessels to address waste management problems in Amsterdam, as well as monitor water quality within the city's famous canals.[18] Publicly integrated tools like this could help mitigate the harms of systemic issues, such as the dumping of waste, but can also disproportionately affect underprivileged communities through surveillance profiling, or economic development decisions of disinvestment.

In the United States, we are seeing countless other examples of AI's use in smart cities. Seattle is one of a dozen cities worldwide that has optimized its traffic signals using AI-powered analysis of traffic data.[19] Philadelphia, Mayor Jim Kenney signed a law in November 2023 that will enable public buses to use AI-powered cameras to issue tickets to vehicles illegally parked in bus lanes or at bus stops.[20] From traffic to the power grid, from the internet to public transportation, the integration of digital technology into our infrastructure networks has the potential to increase efficiency, save money, and improve people's lives. This also means that the nation will require a robust, resilient, and safe communications infrastructure that allows for the radical and universal use of AI technologies by the public and private sectors, as well as residents.

On the technical and operational sides, AI has also been used to bolster wireless capabilities, especially for 5G and other advanced communications tools that rely upon distributed intelligence like in

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[18] Waste Streams [Accessed November 11, 2023] https://senseable.mit.edu/waste-streams/
[19] Paresh Dave, "Google's AI Is Making Traffic Lights More Efficient and Less Annoying," *Wired*, October 10, 2023 https://www.wired.com/story/googles-ai-traffic-lights-driving-annoying/
[20] Beatrice Forman, "SEPTA will officially use AI to ticket cars parked illegally in bus lanes," *The Philadelphia Inquirer*, November 10, 2023 https://www.inquirer.com/transportation/septa-buses-ppa-ai-tickets-20231110.html

cable, fiber, and other wired networks where efficiency and measurement matter to both reasonable and steady network management and quality of service.[21]

B. **Government Use**

Getting government infrastructure in a bold place for rapid and/or thoughtful expansion is also critical to the expansion of the nation's communications infrastructure. Since the advent of open government, existing and emerging technology has been leveraged to make public services more efficient, effective, and accessible. For example, AI is being integrated into a variety of public benefit programs, including user qualification and attainment of unemployment benefits, and in doing so, public workers can redirect their time to more complicated cases through AI-powered chatbots could provide 24/7 guidance for benefits applicants, ameliorating long wait times on benefits hotlines.[22] The Internal Revenue Service (IRS) has begun capitalizing on AI's potential to investigate fraud and tax evasion, while firefighters in California are testing AI tools to help in the more rapid identification of forest fires to reduce response times.[23] In these and other cases in the United States and abroad, AI's use by government is supporting a much more efficient delivery of services that used to be administered in-person via analog systems – largely telephone.

C. **Consumer Engagement**

Another area where AI is becoming increasingly vital to the nation's available and advanced communications infrastructure is around the engagement of everyday people in a range of commercial

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[21] David A. Teich, "The Cable Industry Is Leveraging Artificial Intelligence To Manage And Maintain The Next Generation Of Service Levels," *Forbes*, October 22, 2020 https://www.forbes.com/sites/davidteich/2020/10/22/the-cable-industry-is-leveraging-artificial-intelligence-to-manage-and-maintain-the-next-generation-of-service-levels/?sh=61c15b67432e
[22] Jim Pugh, "AI Could Be a Godsend for Accessing Public Benefits—Or a Nightmare," *In These Times*, August 11, 2023 https://inthesetimes.com/article/ai-artificial-intelligence-food-stamps-snap-public-benefits
[23] Alan Rappeport, "I.R.S. Deploys Artificial Intelligence to Catch Tax Evasion," *The New York Times*, September 8, 2023 https://www.nytimes.com/2023/09/08/us/politics/irs-deploys-artificial-intelligence-to-target-rich-partnerships.html; Leila Fadel and Steve Inskeep, "Firefighters and researchers are turning to AI to help fight fires," *NPR*, July 25, 2023 https://www.npr.org/2023/07/25/1189901985/firefighters-and-researchers-are-turning-to-ai-to-help-fight-fires

and non-commercial products and services. AI has also been instrumental in encouraging participation

in local and civil society activities. By reducing some of the administrative burdens, the public can access

services more easily – at least when they are connected. While also known for its exploitative impacts,

generative AI is particularly well suited to this task, given the advanced capabilities it brings to

automated chatbots.[24] AI can also be used to classify and route requests from peoples seeking more

efficient connections to government information.[25] AI-powered analytical tools can also help process

input from community feedback, leading to more responsive and democratic local governments. This is

incredibly important because improving access to feedback mechanisms like this inherently allows more

diverse voices to be heard and acknowledged in the shaping of our communities.

Thus, when used responsibly and in use cases that serve to advance inclusion, the deployment

of AI tools can help make digital technologies more accessible and useful for everyday users. After all, a

high-speed broadband connection is only one step toward bridging the digital divide, along with digital

literacy and skills. The continued expansion of AI use has the potential to transform our society as we

know it, and the economy is no exception. One study suggests that AI may impact around 80% of the

workforce in the US.[26] The increased productivity enabled by AI-tools could help all workers be more

competitive and make digital skills more accessible, but if we fail to ensure that everyone receives the

necessary training and access, the gap between those with AI skills and those without will only widen

the digital divide – a point that I surface when discussing the risks of AI.

V.   Risks of Artificial Intelligence

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[24] Hila Mehr, "Artificial Intelligence for Citizen Services and Government," *Harvard Ash Center for Democratic Governance and Innovation*, August 2017
https://ash.harvard.edu/files/ash/files/artificial_intelligence_for_citizen_services.pdf
[25] *Ibid*.
[26] Tyna Eloundou, Sam Manning, Pamela Mishkin, and Daniel Rock, "GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models," April 5, 2023 https://ar5iv.labs.arxiv.org/html/2303.10130

There have been great concerns around the threats of AI when as it contributes to online biases that have sociological implications, data privacy infractions due to AI's reliance on large swaths of big and micro data to make innovation decisions, and the potential for other harms and abuses due to lack of federal and local guidance, including regulation.

A. Bias

As I mentioned, AI should not be untethered from digital divide threats. For example, in a city with a dearth of data about certain communities will result in the under-utilization and under-effectiveness of AI tools that are highly data-dependent to make intelligent decisions. That is, much is still unknown for how digital deserts are accounted for in sophisticated AI systems, and the extent to which the lack of data also intersects with other largely known social problems of housing discrimination, geographic rural isolation, or other unremedied challenges like pollution, and tainted brownfields in certain communities. In my forthcoming book, I consider such circumstances to impact a growing group of people that I consider to be "digitally invisible," given the under-representation of their experiences in advanced computational models.[27] My point is that AI is only as good as the data that feeds the systems, and that data can also be traumatized by settled histories, and repeated systemic abuses.

But failing to make the benefits of AI accessible to all communities creates potential dangers of its own – including the lack of ubiquity of advanced communications that are responsibly deployed and universally available. As the deployment of AI continues to transform the economy, it is vital to ensure that the fruits of this technology benefit everyone, instead of entrenching existing societal inequities. And because the nation's communications infrastructure is under the supervision of the United States

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[27] Turner Lee, Nicol. Digitally invisible: How the internet is creating the new underclass. Washington, DC: Brookings Institution.

government, these are critical issues of concern where proactive anticipation is both needed and welcomed.

Because AI tools are increasingly used to make critical decisions with significant impacts on people's lives, they must consistently be checked for bias. Algorithmic decision-making systems have been used to help determine the length of criminal sentences, admit students, make medical diagnoses, approve or deny loans, and assign credit scores.[28] AI-powered facial recognition technology (FRT) has been used for everything from unlocking your phone to accessing government benefits and investigating crimes.[29] When these systems exhibit bias—as they have been proven to do—the potential consequences are severe to individuals and communities. Not having sufficient and representative training data results in biases, like what was discovered in the foundational study around FRT use when researchers Joy Buolamwini and Timnit Gebru found that gender classifications algorithms based on facial analysis were less accurate for darker-skinned women than lighter-skinned men, and that unrepresentative training data may be partially to blame.[30] More recently, a pregnant, Black woman was misidentified and arrested under false pretense due to inaccurate and misinformed use of FRT by the Detroit Metropolitan Police.[31]

However, even when datasets are representative, they can still introduce bias into AI systems. That is because most data need to be cleaned, categorized, and labeled before being suitable for model training, and this task is often carried out by a human being, whose own biases may influence the decisions they make when labeling which faces look friendly, for example.[32] Datasets can also transmit

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[28] Basu et al., 2020; Callahan, 2023;

[29] Rebecca Heilweil, "New York's Chosen AI Keeps Users From Collecting Unemployment," *New York Focus*, June 16, 2023 https://nysfocus.com/2023/06/16/id-me-facial-recognition-unemployment-new-york

[30] Joy Buolamwini and Timnit Gebru, "Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification," *Proceedings of Machine Learning Research* 81:1-15, 2018 http://proceedings.mlr.press/v81/buolamwini18a/buolamwini18a.pdf

[31] Kelley Vaughen, "Detroit police plan facial recognition policy changes after false arrest lawsuit," *CBS Detroit*, August 9, 2023 https://www.cbsnews.com/detroit/news/detroit-police-plan-facial-recognition-policy-changes-after-false-arrest-lawsuit/

[32] Schwartz et al., 2022

bias if they capture information about situations that were created through biased historical decisions. Predictive policing software, for instance, prioritizes deploying police officers in areas where data show the most arrests are made, but those numbers are often based on historically biased, human decisions to heavily police certain neighborhoods.[33]

Eliminating bias from data is exceedingly difficult, especially when it is deeply embedded in back-end systems that direct the systems that support communications intelligence systems. These systems, like the ones previously described, can also pick up on "proxy variables," which are closely correlated with other characteristics like usage rates, speed, and traffic routes of network systems. Because of the opacity of AI in broadly used technological models, we may never account for the range of potential harms.

Like many risks of AI, biased algorithms are not merely a theoretical problem. They can cause harm that results in consequential decisions that may limit or inhibit the expansion of high-speed broadband networks in certain communities. Mitigation is technical, but also implicated by traditionally analog realities, like economic and social inequalities. For example, Baltimore was interested in dockless scooters enabled by AI as part of its effort to reduce traffic congestion, it required that a certain percentage of assets be placed in equity zones as a condition of business doing business with the city.[34]

B. Privacy

The proliferation of AI also carries numerous risks on data privacy – both at the consumer and community levels. AI depends on data: models, including emerging Large Language Models (LLMs), are trained on large datasets, and the advanced analytical powers of AI make data increasingly valuable.

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[33] Aaron Sankin, Dhruv Mehrotra, Surya Mattu, and Annie Gilbertson, "Crime Prediction Software Promised to Be Free of Biases. New Data Shows It Perpetuates Them," *The Markup*, December 2, 2021 https://themarkup.org/prediction-bias/2021/12/02/crime-prediction-software-promised-to-be-free-of-biases-new-data-shows-it-perpetuates-them
[34] Amy Donald, "What Baltimore Can Teach Us About E-Scooters and Equity During COVID-19," Kittelson & Associates [Accessed November 13, 2023] https://www.kittelson.com/ideas/what-baltimore-can-teach-us-about-e-scooters-and-equity-during-covid-19/

These factors, combined with a "radical decline in the cost of collecting, storing, processing, and using data in mass quantities," have fueled an exponential growth in the amount of data collected and stored.[35] My colleague, Cameron Kerry, has referred to this as the "information Big Bang."[36] As more and more data is collected, and as advances in AI make data increasingly valuable, data centers have become a target for hackers and scammers.[37] Since 2005, there have been over 20,000 data breaches in the US, impacting over 2 billion records.[38] It will be crucial to prioritize data security as AI continues to proliferate, or else these dangerous breaches will become even more common, especially as they direct the nation's communications infrastructure. And even if data centers remain secure, the mass aggregation of personal data poses its own privacy concerns, which can be broadly categorized into three types of data risks: data persistence, data repurposing, and data spillovers.[39]

Data Persistence

Data Persistence involves data being stored longer than its subject intended, expected, or is aware. This is a concern both because long-term storage increases the likelihood that data will be compromised and because people's privacy preferences change over time.[40] As people grow older, for example, they develop stronger preferences for withholding data, but weak restrictions on data persistence would force them to be bound by their younger self's preferences.[41]

Data Repurposing

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[35] Ginger Zhe Jin, "Artificial Intelligence and Consumer Privacy," The Economics of Artificial Intelligence: An Agenda, University of Chicago Press, May 2019 https://www.nber.org/system/files/chapters/c14034/c14034.pdf

[36] Cameron F. Kerry, "Protecting privacy in an AI-driven world," The Brookings Institution, February 10, 2020 https://www.brookings.edu/articles/protecting-privacy-in-an-ai-driven-world/

[37] Ginger Zhe Jin, "Artificial Intelligence and Consumer Privacy," The Economics of Artificial Intelligence: An Agenda, University of Chicago Press, May 2019 https://www.nber.org/system/files/chapters/c14034/c14034.pdf

[38] "Data Braches," Privacy Rights Clearinghouse [Accessed November 10, 2023] https://privacyrights.org/data-breaches

[39] Catherine Tucker, "Privacy, Algorithms, and Artificial Intelligence," The Economics of Artificial Intelligence: An Agenda, University of Chicago Press, May 2019 https://www.nber.org/system/files/chapters/c14011/c14011.pdf

[40] *Ibid*.

[41] *Ibid*.

Data Repurposing refers to the use of collected data for something other than its originally intended purpose. In one famous example, researchers found a correlation between Liking "Curly Fries" on Facebook and having a high IQ.[42] You might be willing to have data on your food preferences be recorded if you thought it would only be used to show you more relevant advertisements, but you might be less happy about it if you knew it could be used by a potential employer, for example, to predict your IQ.[43] The advancement of AI means that data is becoming inherently more invasive. AI tools can digest and analyze vast amounts of data; as their proliferation continues, data that once seemed mundane may be used to make increasingly personal inferences.

Data Spillovers

Data Spillovers refers to the collection of data on people other than the intended target. Many electric scooter rentals, for example, require you to submit a photograph of where you leave the scooter at the end of your trip: Depending on how you take the photo, it might other vehicles license plate numbers or other people, who did not consent to have their data recorded by the rental agency. Some types of data naturally result in spillovers. Data that predicts you may have a genetic predisposition to a certain medical condition, for example, could also be used to make the same prediction about your relatives, even though the choice to share your data was yours alone.[44]

Much is generally known about the surveillance systems that collect that data to the detriment of people's personal and community privacy. Smart city projects that improve urban infrastructure also involve surveillance systems that can jeopardize civil liberties. Last year, the District of Columbia approved a $309 million contract to convert the city's streetlights to "smart," LED lights with wireless

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[42] Michal Kosinski, David Stillwell, and Thore Graepel, "Private traits and attributes are predictable from digital records of human behavior," *PNAS*, February 12, 2013 https://www.pnas.org/doi/pdf/10.1073/pnas.1218772110
[43] Tucker, 2019.
[44] *Ibid*.

connectivity.[45] These smart streetlights have the potential to extend internet coverage and lower carbon emissions, but they also make it easy for cities to install cameras, microphones, and other surveillance technology that jeopardize everyone's right to privacy and disproportionately impact marginalized communities.[46] Currently, most cities do not have laws that require residents be notified of new surveillance equipment, and D.C.'s Data Policy does not require public approval before collecting and storing data.[47] We urgently need comprehensive, federal privacy legislation. Our current patchwork of state laws generates too much uncertainty for both developers, who are forced to comply with a variety of different requirements to do business nationwide, and citizens, whose privacy protections range from state to state. As my colleague, Cameron Kerry, has argued, privacy legislation could address many of the risks posed by artificial intelligence by providing algorithmic accountability and fairness requirements and creating clear guidelines for the "collection, use, and sharing of personal information."[48]

The White House Executive Order on AI calls out the need for a national data privacy standard as part of the identification and mitigation of AI risks, and rightfully so. Without data privacy as a national standard to balance AI innovation and growth, additional risks will be placed on American communications both on infrastructure and the resulting activities that are exercised over it.

C. **Workforce and worker implications**

Expanding American communications networks and protocols will require a massive labor investment. Even before the IIJA, the broadband industry estimated a need for 850,000 new broadband

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[45] Michael Silberman, "Streetlights as Spyware," *Tech Policy Press*, August 30, 2023 https://techpolicy.press/streetlights-as-spyware/
[46] Ibid.
[47] Sarah Holder, "The Shadowy Side of LED Streetlights," *Bloomberg*, March 8, 2018 https://www.bloomberg.com/news/articles/2018-03-08/led-streetlights-raise-new-opportunities-for-surveillance; Silberman, 2023.
[48] Cameron F. Kerry, "How privacy legislation can help address AI," *Brookings*, July 7 2023 https://www.brookings.edu/articles/how-privacy-legislation-can-help-address-ai/

jobs through 2025.[49] Last year, Secretary of Commerce Gina Raimondo predicted that the IIJA's $65 billion in broadband funding alone would create 200,000 new jobs.[50] Building an inclusive broadband workforce is an important aspect of digital equity, and a whole-sector approach will be needed to take advantage of this opportunity to create full-time, high-quality jobs.[51] While AI may be a tempting solution to address workforce shortages by mitigating labor force challenges, this strategy could have negative effects on the job market, and outsize workers in need of livable wage jobs from the burgeoning workforce. Likewise, employers that are increasingly using AI tools to monitor workers may also contribute to the problem as automated surveillance creates a negative impact on employee's mental health, and productivity.[52] In the end, AI systems that are leveraged for workforce development should properly train and place workers – even those without college degrees. Low-wage and frontline workers, who may be more likely subjected to employee surveillance should also be free from such invasive and opaque monitoring, especially if they are helping to fill roles that enable American communications networks. The White House EO sufficiently addresses these realities.

D. The need for federal guidance

With all the advisements that have recently occurred related to AI, the United States still sits behind other countries when it comes to both a national data privacy standard,[53] and comprehensive (as

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[49] Scott Jensen, Kelly Rogers, and Kate Finnerty, "Key Steps in Creating a Diverse Broadband Workforce," Route Fifty, March 28, 2023, https://www.route-fifty.com/workforce/2023/03/key-steps-creating-diverse-broadband-workforce/384537/

[50] Diana Goovaerts, "Commerce Chief: $65B in broadband funding will create 200,000 jobs," *Fierce Telecom*, February 1, 2022 https://www.fiercetelecom.com/broadband/commerce-chief-65b-broadband-funding-will-create-200000-jobs

[51] Nicol Turner Lee and Jack Malamud, "Workforce development is a crucial part of digital equity," *Brookings*, May 18, 2023 https://www.brookings.edu/articles/workforce-development-is-a-crucial-part-of-digital-equity/

[52] Aditi Shrikant, "Companies use AI to monitor workers—45% of empoyees say it has a negative effect on their mental health," *CNBC*, September 8, 2023 https://www.cnbc.com/2023/09/08/employers-using-ai-to-monitor-workers-has-negative-impact-on-employees.html

[53] Gai Sher and Ariela Benchlouch, "The privacy paradox with AI," *Reuters*, October 31, 2023 https://www.reuters.com/legal/legalindustry/privacy-paradox-with-ai-2023-10-31/

well as binding) AI guidance, including how the federal government procures AI products and services.[54]

While the recent Executive Order on AI is a step in the right direction, it stands in need of more

actionable and enforceable legislation, and it's vulnerable, especially if the next president were to

reverse it. At the state level, the patchwork system of both different privacy laws with different

requirements for companies and expectations of citizens, along with the increasing state approaches to

AI and specific technologies, including facial recognition, appear to be the writing on the wall when it

comes to ensuring universal and responsible access to these and future systems.

      In addition to both regulation and self-regulatory best practices, it will also be imperative to

identify technical and socio-technical risks as outlined in the NIST Risk Management Framework and

decide upon the appropriate transparency and measurement tools. Clear disclosure and guidance for

the use of AI will require comprehensive investigation of its reliability, but such research can only be

possible through increased transparency on the part of those deploying it, especially the federal

government and cities which the former will be addressed through the OMB request for comment on AI

use by federal agencies. Prioritizing public disclosure requirements for the use of artificial intelligence

tools—especially by the government—can encourage meaningful collaboration between cities and avert

the consequences of biased technologies that reinforce rather than transform existing ecosystems.

      Members of the public must also be informed about AI use in their communities, and more

broadly within American communications so that they opine on the implementation of these systems

that could affect their lives through misinformation, extracted cultural competence, and eroded

communications infrastructure. As cities across the United States pursue "smart city" projects that often

involve widespread implementation of cameras, microphones, and other sensors, their residents must

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[54] Darrell M. West, "Reforming federal procurement and acquisitions policies," *Brookings*, April 3, 2023
https://www.brookings.edu/articles/reforming-federal-procurement-and-acquisitions-policies/

be notified of any expanded surveillance measures and given the opportunity to respond, and having a national privacy standard as the foundation of such data collection can help with exploitative extraction.

VI.   Moving forward

The focus on AI to build, support, and sustain American infrastructure is both a welcomed and interesting inquiry by this Committee. As AI promises to transform the economy, its benefits should be readily available to everyone, and not contribute to the current digital divide that looms in the backdrop of universal access to high-speed broadband. This requires us to understand how the AI will create more livable places, promote easily accessible government resources, and center people in the design, deployment, and feedback. Simultaneously, the risks associated with existing and emerging technologies must prevail, and drive us to deliver more responsible, fair, and inclusive systems that do not erase or make invisible the experiences of individuals, and the value of their communities.

Congress should seriously consider the impact of AI on the digital divide and economy, and put their heft behind some of the active policy proposals to ensure that these systems for foreclose on opportunities for residents to fully and productively engage our democracy, including entertaining disclosures of AI-generated content to quell deep fakes through authenticated watermarking, although this technology needs further development and will only be one component of the AI-safety toolbox.[55] Further, Congress could institute immediate disclosure of any AI use by creators, licensees, and deployers of the technology when making critical socioeconomic determinations, which is something that I have discussed in my research. Utilizing the same structure of the 'energy-star rating,' which is widely used to assess the performance of consumer appliances, transparency and disclosure can be

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[55] Diane Bartz and Krystal Hu, "OpenAI, Google, others pledge to watermark AI content for safety, White House says," *Reuters*, July 21 2023 https://reuters.com/technology/openai-google-others-pledge-watermark-ai-content-safety-white-house-2023-07-21/; Makena Kelly, "Watermarks aren't the silver bullet for AI misinformation," *The Verge*, October 31, 2023 https://www.theverge.com/2023/10/31/23940626/artificial-intelligence-ai-digital-watermarks-biden-executive-order

actualized in a manner that is already widely understood by consumers.[56] One final note, which is not exhaustive of the range of policy solutions to mitigate AI risks, is the deliberate investigation into equitable AI – a point that is repeatedly called out in the Executive Order.

At Brookings, we have deployed the first AI Equity Lab to workshop pragmatic solutions that reconcile innovation, equitable and fair outcomes that are lawfully compliant with existing civil and human rights laws and offer plausible short- and long-term solutions that center public interest. With technology moving at rapid speed, it is imperative that the nation's communications infrastructure continue to be nimble enough to accommodate the explosive growth of technology, while making sure that the physical benefits are widely available, and the adverse consequences are not.

Thank you again to the Members of the Subcommittee on Communications and Technology for the opportunity to testify, and I look forward to your questions. I also want to thank Brookings researchers Eugenie Park, Xavier Freeman-Edwards, and Jack Malamud for their assistance in preparing my statement.

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[56] Nicol Turner Lee, "Mitigating Algorithmic Biases through Incentive-Based Rating Systems," *The Oxford Handbook of AI Governance*, ed. Justin B. Bullock, Yu-Che Chen, Johannes Himmelreich, Valerie M. Hudson, Anton Korinek, Matthew M. Young, and Baobao Zhang (Oxford: Oxford University Press, February 14 2022) https://academic.oup.com/edited-volume/41989/chapter-abstract/371700304?redirectedFrom=fulltext