

Alphabet

0 2 1

To our investors,

The pandemic continues to test the resilience of our communities and change the ways we work, learn, and find connection. As more people and businesses come online, greater amounts of information are being created than ever before; it's an exciting challenge for a company whose mission is to organize the world's information and make it universally accessible and useful.

In 2021, our teams approached this mission with new purpose and possibility, and continued to develop helpful technologies with a view toward empowering both people and businesses. A new advancement in AI called Multitask Unified Model improved searches for vaccine information in dozens of languages. We introduced new ways to search visually and express questions in more natural ways. On Maps, people found vaccination sites near them, used Live View to navigate through tricky indoor spaces like airports and malls, and located businesses that had wheelchair-accessible entrances.

We also built tools and features that help businesses collaborate more safely and securely. Smart canvas on Google Workspace is helping teams work together in a hybrid environment, and our Work Safer program provides Google Cloud customers with the highest level of security against cyber threats.

As cities and towns began to open up again, we supported their recovery. We met an ambitious goal to train 10 million people and businesses in digital skills in Europe, the Middle East, and Africa; invested in Black founders and entrepreneurs; and launched new Career Certificates focused on good-paying, high-growth fields. We also continued to make sure that technology benefits people everywhere. For example, we launched a new phone designed for India in partnership with Jio Platforms Ltd. and made a \$1 billion commitment to Africa to support connectivity and communities across the continent.

We made important progress on our goal of running our campuses and data centers on carbon-free energy 24/7 by 2030. In 2021, five of our data centers were operating near or above 90% carbon-free energy, and we continued to offer the cleanest cloud in the industry for customers. As part of our goal to

help 1 billion people make more sustainable choices, we launched a number of new efforts, including bringing carbon emissions information to Google Flights and a program to help people support clean energy from their Nest thermostats.

2021 marked two decades of AI and machine learning at Google. What began as a statistical ML effort to detect spam and suggest better spellings for web searches has developed into a foundational technology powering some of our most helpful products. It's what enables everything from the natural, free-flowing conversations with Google Assistant to the Real Tone technology that better represents all skin tones in photography. And to bring the best of AI and ML features to our phones, we developed our custom silicon Tensor chip, which is enabling powerful new experiences on Pixel.

By investing in advanced technologies we continue to push the boundaries of scientific discovery. For example, DeepMind's AlphaFold system reached a protein-folding breakthrough that solved a 50-year-old challenge of biology, and Google's quantum researchers observed a phenomenon called time crystals, a newly identified phase of matter that can forever cycle between states without consuming energy.

In the year ahead, we will continue to build on our advances in knowledge and computing to help people and communities everywhere. We will share more about our vision of this future when we bring developers together for I/O in May. In the meantime, I want to express my gratitude to everyone at Alphabet, for strong performance and making 2021 an extraordinary year. And to our investors, who believe in our mission as deeply as we do—thank you.



Sundar Pichai
CEO of Google and Alphabet

Contents

4 Helping the world respond to the pandemic

6 Building products to help in moments that matter

12 Earning user trust with safer experiences

14 Supporting our partners' resilience and success

18 Creating economic opportunity for job seekers, startups, and small businesses

24 Building a more equitable and inclusive world

28 Taking decisive action against the climate crisis

30 Other bets

32 Directors and executive officers

A year of resilience and adaptation

Around the world, 2021 brought new challenges to how we live, with each day carrying uncertainty and unpredictability. People, businesses, and communities were tested in profound ways but found the resilience they needed to endure in the face of these challenges. Alphabet endeavored to be there every step of the way. At Google, that meant harnessing the best of AI and new technologies to help the world face the pandemic, build helpful products, protect user trust and safety, and support our partners making an impact.

Helping the world respond to the pandemic



Year in Search

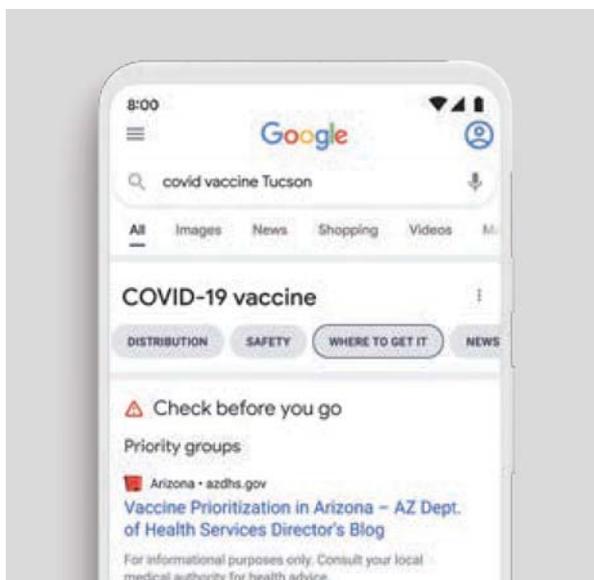
This year, the world searched "how to heal" more than ever before.

As the pandemic entered a new chapter, we knew that one of the most impactful ways we could help was to keep people informed with authoritative information and connect them with resources for care. COVID-19-related searches continued to surge, and as varying terminology and vaccine names proliferated, connecting people with the right information became increasingly complex. With Multitask Unified Model (MUM), our latest AI milestone, we were able to identify over 800 variations of vaccine names in more than 50 languages in a matter of seconds, applying them to Google Search to more rapidly help people find timely, high-quality information about COVID-19 vaccines worldwide. To ensure easy access to locally relevant vaccine information, we expanded our COVID-19 information panels on Search to more than 40 countries and dozens of languages.

We also worked with partners like VaccineFinder.org, government agencies, and retail pharmacies to gather vaccine location information and build it into Maps. People could find vaccination sites nearby with information like whether an appointment or referral was required, if access was limited to specific groups, or if it had a drive-through. To ensure access

to authoritative information, we conducted nearly 10,000 fact checks of sources appearing in Search and Google News, and we invested in organizations working to stop the spread of misinformation through Google News Initiative's COVID-19 Vaccine Counter-Misinformation Open Fund.

For public health authorities globally, getting vaccines to billions of people quickly presented a complicated challenge where we saw an opportunity to help. We committed more than \$100 million in ad grants for the CDC Foundation, the World Health Organization, and nonprofits to promote vaccine education public service announcements. To help accelerate the pace of vaccinations, Google Cloud worked with healthcare organizations, retail pharmacies, logistics companies, and public sector institutions to facilitate vaccine delivery and appointments. With disproportionately affected populations lacking equal access to vaccines, we heavily focused our efforts on vaccine equity, including \$5 million in Google.org grants to organizations addressing racial and geographic disparities and a partnership with Gavi, the Vaccine Alliance, to secure vaccines for 250,000 people and promote vaccine education for low- and middle-income countries. Fighting the pandemic won't end until the health of every community around the world is protected, and we are committed to helping make that possible.



Vaccine finder Search results

Search and Maps were updated to quickly connect people with nearby vaccination sites and essential information like current eligibility requirements.

10,000

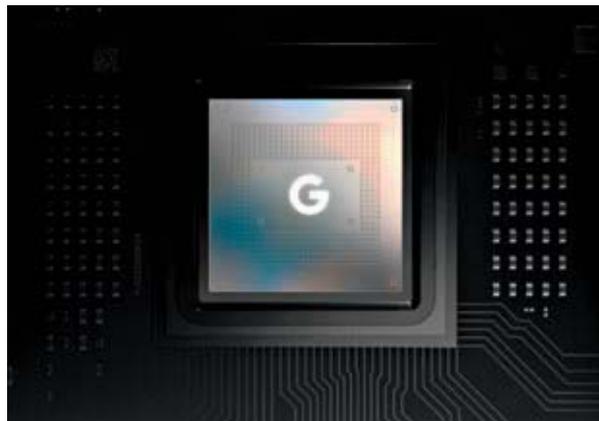
fact checks about
the pandemic across
our products.

Building products to help in moments that matter



Pixel 6

The newly redesigned Pixel 6 and Pixel 6 Pro—powered by the Google Tensor chip—is Google’s most powerful and personal phone yet.



Google Tensor

The new Google Tensor chip enables the Pixel 6 and Pixel 6 Pro to develop new capabilities over time by keeping pace with the latest advancements in machine learning.



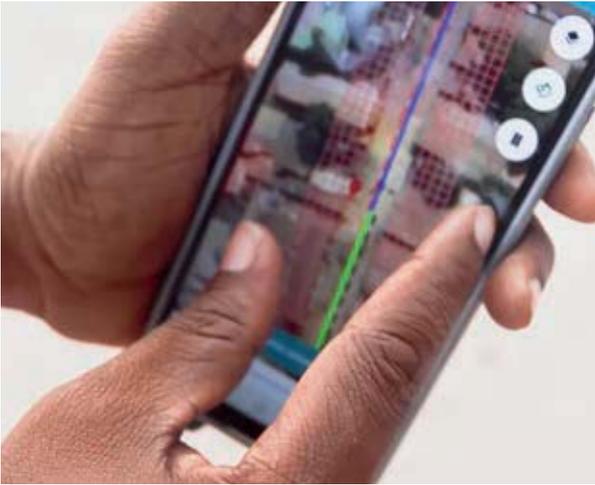
Google Meet

Meet's new, intuitive interactive interface allows participants to display up to 49 people at once and hide self-view to reduce meeting fatigue.

The world continued to work, learn, and play from home, so we made it our focus to give everyone tools that could keep them connected. One of the most significant improvements we made to Google Workspace is that anyone with a Google Account now has access to a more seamless, collaborative experience across Gmail, Chat, Calendar, Drive, Docs, Sheets, Meet, and more. Through features like presence indicators, expressive reactions, and smart canvas, they can have a richer, more helpful experience. With so many people relying on Meet for videoconferencing, we introduced new innovations, including automatic light adjustments and noise reduction, translated captions, and breakout rooms to help them more effectively come together.

In October, we released Pixel 6 and Pixel 6 Pro, the completely redesigned Google phones. Powered by Google Tensor, our custom system on a chip, and shipping with Android 12, these new Pixel phones are fast, smart, secure, and designed to adapt to you. Google Tensor enables entirely new capabilities, making Pixel 6 and Pixel 6 Pro more helpful and more personal.

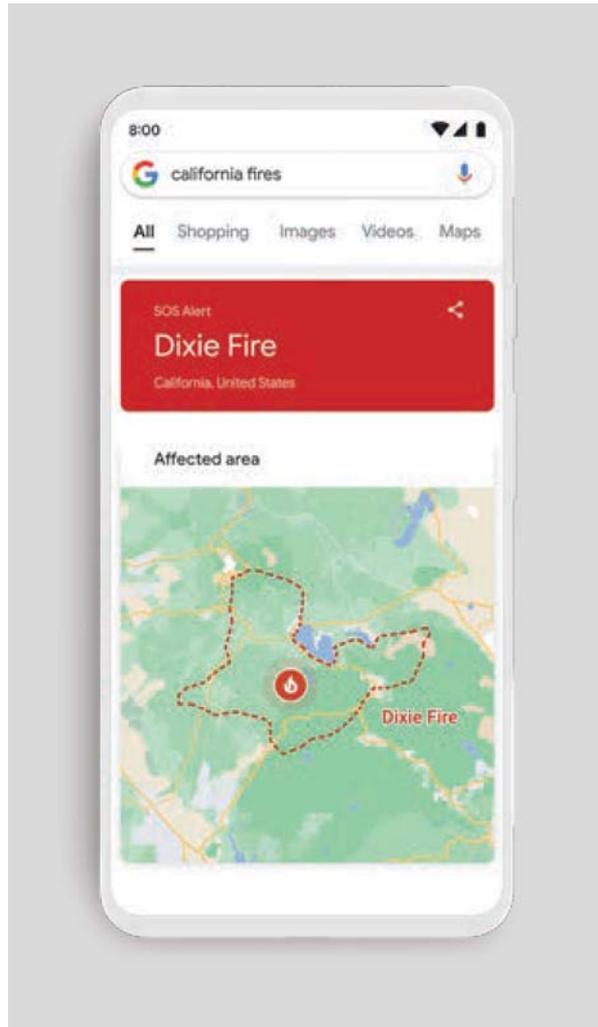
2021 was also a big year for Search: At I/O, we announced Multitask Unified Model, AI-powered information understanding technology that's enabling us to create entirely new ways to search. MUM is multimodal, which means it can process different types of inputs simultaneously. MUM will let people search an image with a text query alongside it, making it easier to find a favorite shirt print on socks as well. By combining different types of inputs into a single query, we're helping people express questions in more natural ways.



Plus Codes

Several billion people still don't have an address, making it difficult to do things many people take for granted, like voting, opening a bank account, applying for a job, or simply getting a package delivered. With our new, free Address Maker app, organizations like governments and NGOs can now use our open source system called Plus Codes to create unique, functioning addresses at scale, right from an Android app.

In Maps, we introduced new features to help keep people safe. Our new wildfire layer provides up-to-date details about multiple fires at once and links to local resources, allowing people to make quick, informed decisions during times of emergency. We also worked to address the fact that several billion people around the world still don't have an address, making it difficult to vote, apply for a job, or get a package delivered. We partnered with governments and NGOs to provide addresses to people around the world with our new, free Address Maker app, which uses our open source system called Plus Codes to create unique, functioning addresses at scale, right from an Android app. Through these improvements and more, we are working to give every community the tools it needs to thrive.



Maps wildfire layer

The new wildfire layer in Google Maps connects people with resources from local governments and, when available, important details about the fire, such as its containment and how many acres have burned.

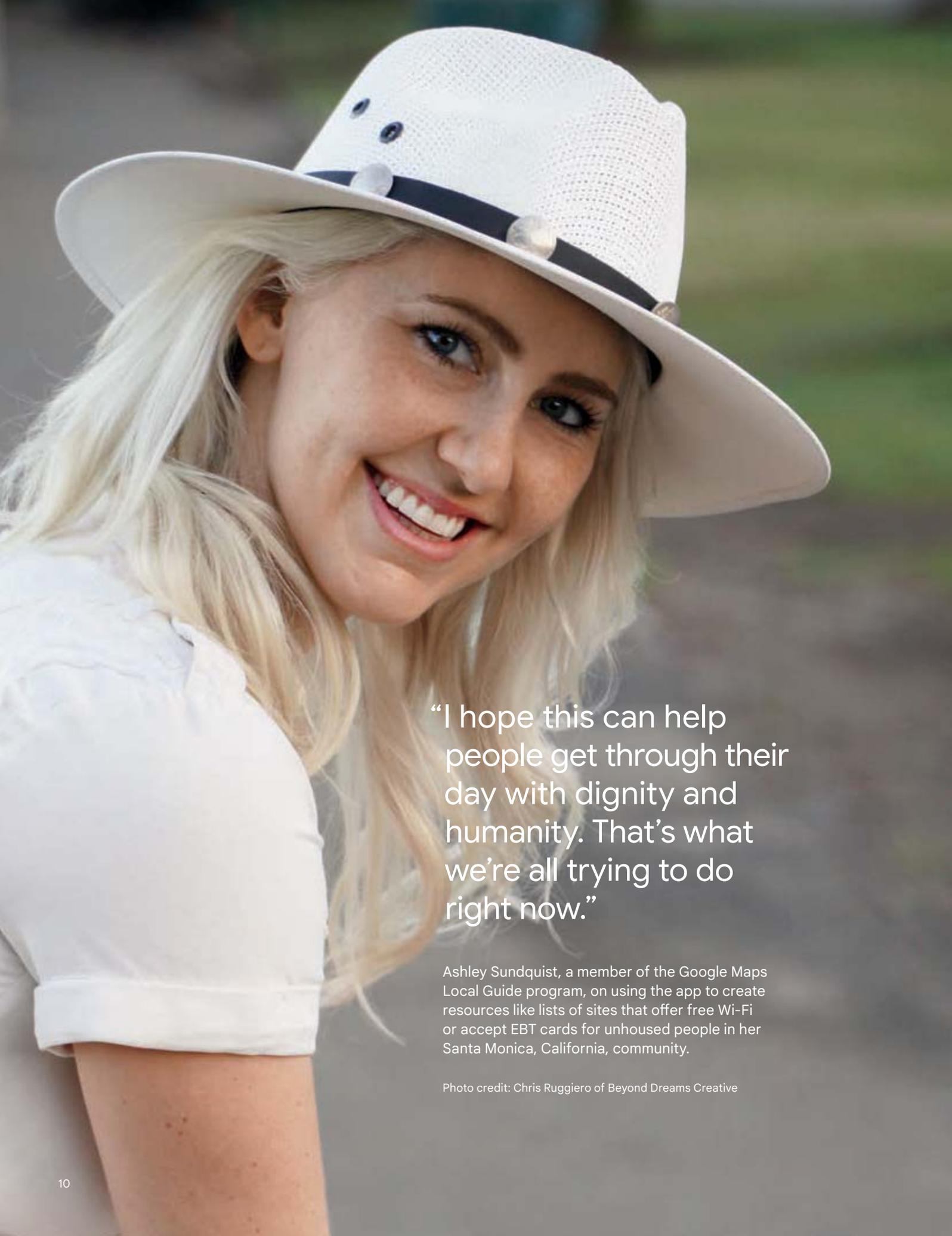


Quantum AI campus

In May, we opened our new Quantum AI campus in Santa Barbara, California. The campus is home to our first quantum data center, new research laboratories, and quantum processor fabrication facilities—core facets of our journey to build the first error-corrected quantum computer.

Project Starline

Project Starline will evolve how we video chat with an experience that simulates being face-to-face even when you're physically apart by applying research in computer vision, machine learning, spatial audio, and real-time compression.



“I hope this can help people get through their day with dignity and humanity. That’s what we’re all trying to do right now.”

Ashley Sundquist, a member of the Google Maps Local Guide program, on using the app to create resources like lists of sites that offer free Wi-Fi or accept EBT cards for unhoused people in her Santa Monica, California, community.

Photo credit: Chris Ruggiero of Beyond Dreams Creative



Youth Resources in Los Angeles

By Ashley Sundquist • 24 places

These locations provide resources for youth who are experiencing homelessness in Los Angeles. You are not forgotten. You are not alone. You are loved.

If you need immediate assistance, please call the free/confidential California Youth Crisis Line at 1-800-843-5200 or the 211 Hotline at 1-800-339-6993.



The Village Family Services

3.3 ★★★★★ (15)

Association or organization • 2 mi

Open • Closes 7PM



Earning user trust with safer experiences

4B

photos encrypted by Google Photos daily.

100M

phishing attempts blocked by Gmail daily.

100B

installed apps utilizing security scans run by Google Play Protect daily.

Our products and services are only as helpful as the safeguards that protect them, which became even more critical as more of our lives moved online. Over the year, we made investments and developed new innovations so that every day people are safer with Google.

With businesses transitioning to hybrid work, cyber and ransomware attacks became an increased threat, making it that much more essential for people to trust that our products are secure by default. As more and more organizations chose Google Cloud to drive their digital transformation, we formed the Google Cybersecurity Action Team to support our customers in making the most of our tools and achieving cyber-resilience preparedness. We also announced that over the next five years, we will invest \$10 billion to strengthen cybersecurity, including expanding zero-trust programs, helping secure the software supply chain, and enhancing open source security.

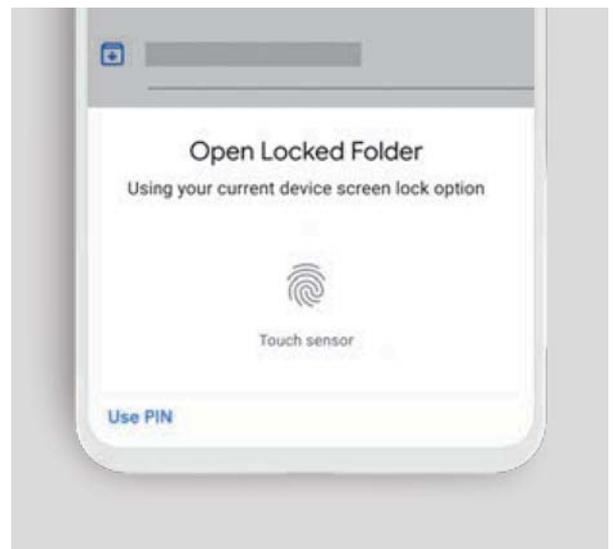
For consumers, one of the biggest risks they continuously face is their reliance on passwords, which are frequently vulnerable to attack. We made significant updates to Password Manager to help keep this threat at bay: We added a new tool that makes it easy to import passwords from other managers and deepened integrations with Chrome, and on supported sites and apps, people can change a compromised password with a single tap.

Trust and safety work only when people have control over their data. To that end, we launched a new “quick delete” option to delete the last 15 minutes of your Search history with a single tap from the Google Account Menu. We also launched Locked Folder in Photos, a password-protected option to keep your photos private. In Android 12, we introduced industry-leading transparency and permission features, including a new Privacy Dashboard, where people will see a timeline of when apps accessed their camera, microphone, or device location. With these features we want people to know that their data is just that—theirs.



Kid and teen safety

Across our products we made a number of updates to keep kids and teens safer online. We announced that on YouTube, the default upload setting will be the most private option available for teens ages 13–17 and on Search, SafeSearch will be the default setting for users under 18.



Locked Folder

With Locked Folder, people can create a passcode-protected space where they can save photos separately, so they won't show up as they scroll through Google Photos or any other apps on their device.

Supporting our partners' resilience and success

Our success is made possible by our partners' success, and even early on in 2021, we were heartened by strong signs of recovery and growth. We continued to make hundreds of improvements to Google Ads each quarter to help businesses more effectively connect with their customers and make the most out of their marketing spend. For instance, it's now even easier for businesses to claim their Business Profile on Search and Maps and we know building an online presence makes a difference: In Germany, completed Business Profiles receive an average of over five times more calls than those that aren't finished.

On YouTube, more people created content than ever before, and the number of YouTube channels that made at least \$10,000 in revenue increased more than 40%. YouTube Shorts saw especially dramatic growth, with over 15 billion views each day globally. Through Shorts and the YouTube Partner Program—which now provides 10 different ways to monetize content—our creator community is growing and connecting with audiences in new ways.

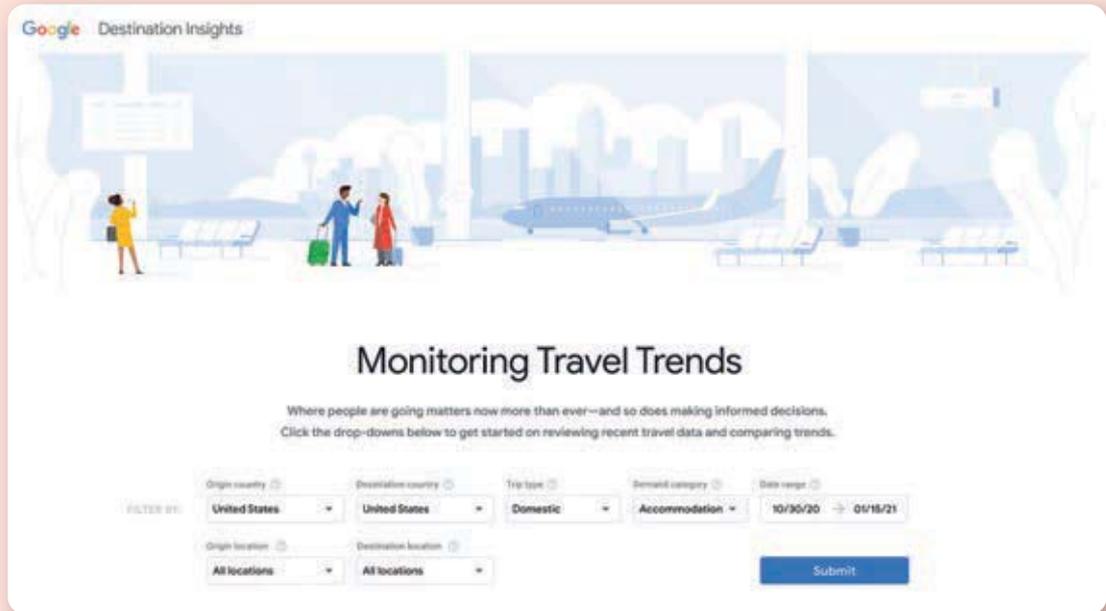
At Google Cloud, we helped customers take on the new challenges and opportunities of a digital, AI-first world. We embarked on a first-of-its-kind, six-year partnership with Ford to use Cloud, Android, and other Google apps and services to transform its business and reimagine the connected vehicle experience.

We also worked to help consumers and businesses adapt with better shopping experiences. Our expanded partnerships with third-party partners like Shopify and WooCommerce enabled millions of merchants to feature their products across Google in just a few clicks. For shoppers, we introduced a

new, more visual shopping experience on Search and continued to leverage our AI-enhanced model—Shopping Graph, which analyzes variables to connect shoppers with the most relevant products as they search. On YouTube, we introduced new elements like product feeds and live commerce to make it even easier for shoppers to buy what they see.

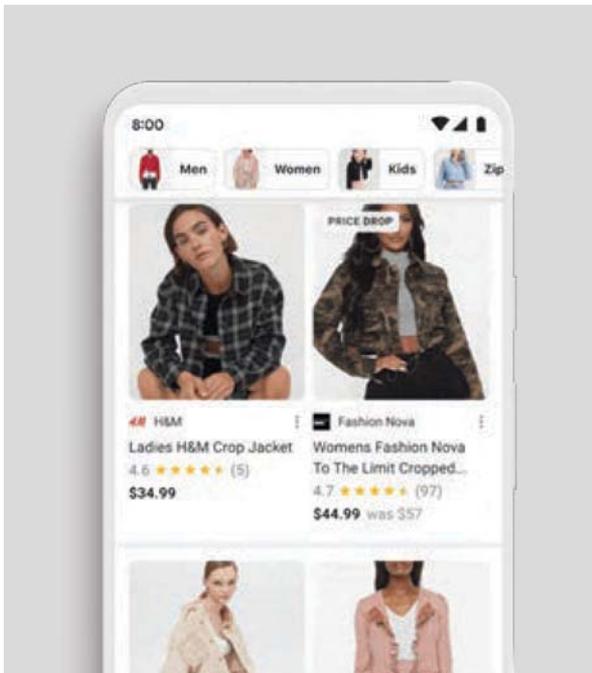
Supporting the future of journalism remains a crucial priority; in 2021, our publisher partners earned more than ever from our network and Google remained one of the world's biggest financial supporters of news through our services and through our direct funding of news organizations. In 2020, we announced Google News Showcase, a product experience and licensing program designed to connect readers with curated panels by publishers featuring important stories and insights. In 2021, participating publishers created over 1 million News Showcase panels and readers tapped the Follow button on panels to stay up to date with their favorite publishers over 1.8 million times.

Back in 2020 we announced a \$4.5 billion investment in Jio Platforms Ltd., the first and largest investment from the Google for India Digitization Fund. With this partnership, we set out to address the gaps in usability and affordability that have kept millions of people in India from attaining smartphones—often the primary way to access the internet. In 2021, we were excited to preview the resulting smartphone developed in collaboration with Jio, custom-made to meet the needs of India's new smartphone users. We also announced a partnership between Jio and Google Cloud to help advance 5G in enterprise and consumer segments in India, a crucial step toward their digital future.



Travel trends

Our new Travel Insights tool helps partners in the U.S. and select countries in APAC and EMEA get a clear picture of where demand is coming from in real time.



Shopping

Google's Shopping Graph, a comprehensive, real-time data set of products, inventory, and merchants with more than 24 billion listings, helps people browse products right from Search.

1B

There are now over 1 billion shopping sessions per day across Google.

“Speed is imperative, but our reputations are staked on the accuracy of our reporting.”

The Boston Globe’s quick-strike investigative team was awarded the 2021 Pulitzer Prize for investigative reporting. “Blind Spot” revealed multiple state governments’ failures to share information to keep dangerous drivers off the road. Pinpoint, a tool that uses the best of Google’s AI and machine learning technology, helped the team quickly go through troves of files, like court documents, photos, handwritten files, and spreadsheets, with precision. “Speed is imperative, but our reputations are staked on the accuracy of our reporting,” said reporter Vernal Coleman. Pinpoint is supported in seven languages.





Creating economic opportunity for job seekers, startups, and small businesses



Career Certificates participants

Through the Grow with Google Career Certificates program, job seekers around the world can gain skills in in-demand fields like data analytics and project management.

\$617B

Google advertising tools helped provide \$617 billion of economic activity for millions of American businesses, nonprofits, publishers, creators, and developers.

20M+

Over 20 million U.S. businesses received direct connections to their customers from Google.

\$7B+

Google invested over \$7 billion in data centers and offices across the U.S.

156,500

employees worldwide.

While the world was reshaped by unprecedented shifts, we sought to help people weather turbulent economies by creating opportunity. The small business sector continued to be one of the hardest hit, so to help them accomplish more and connect with their customers, we added new features to our products. In Search and Maps, businesses can now tailor their profiles in more ways, like noting specific services.

Google's commitment of \$185 million enabled Opportunity Finance Network (OFN) to establish the Grow with Google Small Business Fund and OFN's Grant Program funded by Google.org. The fund delivered low-interest loans to over 50 community development financial institutions (CDFIs), which in turn provided loans to tens of thousands of underserved small businesses. Over the last two years, the loans and grants were disbursed to OFN-member CDFIs, including \$50 million to support



U.S. SMB

Small business support: To help small businesses more effectively connect with customers, their Business Profile on Search and Maps can now show what services they offer and what's in stock. Additionally, we made it free for every business on Shopify, WooCommerce, GoDaddy, and Square to show their products across Google.

Black-owned businesses. We also announced a \$75 million investment in international partnerships to support small businesses outside of the U.S., including our \$15 million commitment to fund small and micro businesses in India.

Throughout the year, we saw searches like "great jobs without a degree" and "online courses with certificates" increase dramatically as people sought new roles. To help job seekers gain skills in high-growth fields, we expanded our online Career Certificates program to make it free for all U.S. community colleges and Career and Technical Education (CTE) high schools. The 70,000 graduates in the U.S. gained access to a 150-company employer consortium, and 75% of graduates reported a positive career impact within six months of completion.

In the U.S., business began to rebound from 2020, and it was important for us to continue to play a part in its recovery. We announced plans to invest over \$7 billion in offices and data centers across the U.S. and create at least 10,000 new full-time Google jobs in the U.S. in 2021. We added thousands of roles in Atlanta, Washington, D.C., Chicago, and New York, which helped us bring more jobs and investment to diverse communities.

Beyond the U.S., we announced significant investments to support key growing economies. With the Digital Future Initiative, we made a \$1 billion, five-year commitment in Australia, including initiatives to strengthen digital infrastructure, develop Australian technology and talent, and solve global and local challenges. At our Google for Africa event, we announced a \$1 billion commitment in Africa over five years to cover a range of initiatives, from improved connectivity to investments in startups. And in Germany, we announced a €1 billion commitment between 2021 and 2030 to support the transition to a digital and sustainable economy. Through these commitments, we hope to create abundant economic opportunity for all.

St. John’s Terminal

The St. John’s Terminal site at 550 Washington Street, which we currently lease and expect to open by mid-2023, will be one part of the already sizable investment we’ve made in New York—and Google’s largest office outside California.

Rendering credit: COOKFOX Architects





A person is seen from the side, sitting at a table and writing in a notebook with a black pen. The background is a blurred interior of a shop, featuring a bright yellow modern chair, a potted plant with purple flowers, and a window with decorative glass. The lighting is soft and natural, suggesting an indoor setting with large windows.

“Particularly for smaller businesses, Google Ads is the key for visibility and findability online. We would never have reached so many suitable new customers without the advertisements.”

Manon Weßels, owner of the German small business *das schöne leben*, a store that specializes in exceptional food and designer products for everyday living. When the pandemic hit, the founders of the store started advertising online alongside their in-store sales and set up a Business Profile on Google Search and Maps to help existing and potential customers find them. *Das schöne leben* now has customers of all ages throughout Germany and has tripled its direct online orders with its first in-house Search campaign.

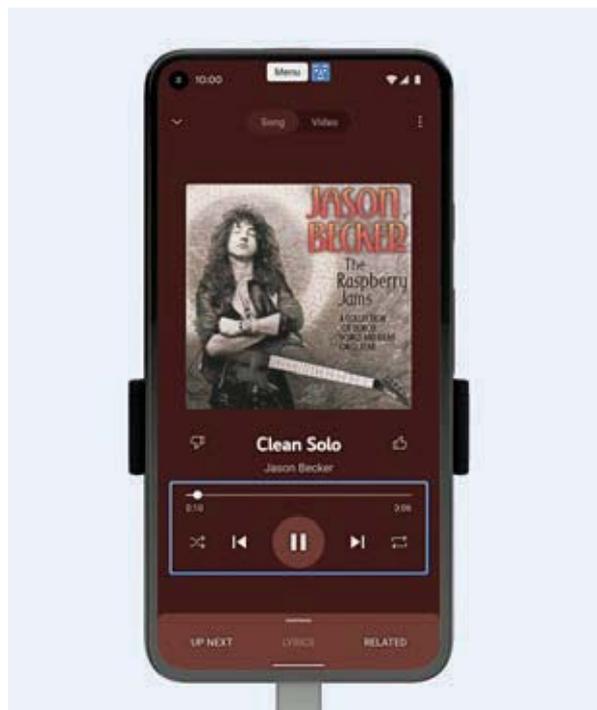


Building a more equitable and inclusive world



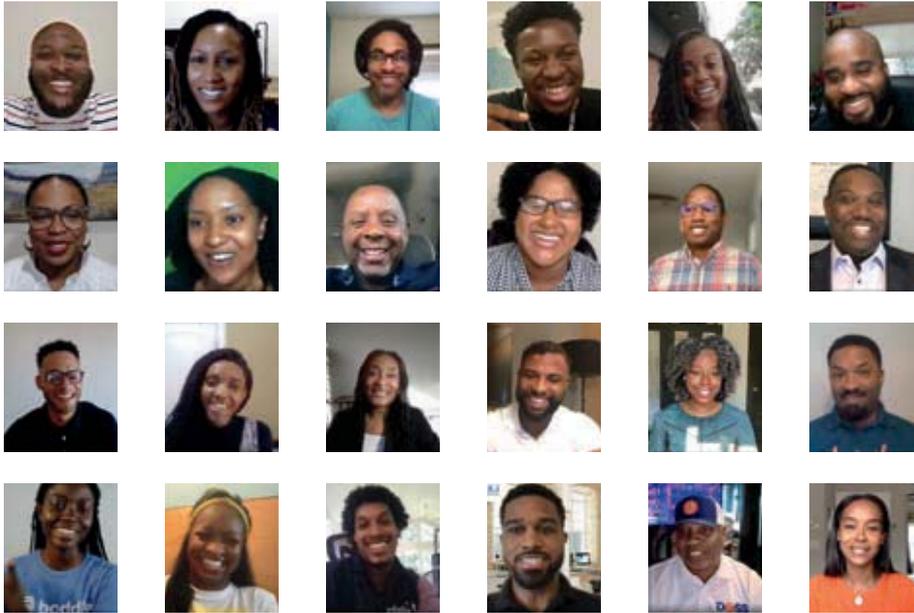
\$1.5B

We surpassed our goal to spend \$1 billion with diverse-owned suppliers in 2021 by spending nearly \$1.5 billion.



Camera Switches

We expanded the Android Accessibility Suite with Camera Switches, a new feature in Switch Access that turns your phone's camera into a new type of switch that enables you to navigate your phone with facial gestures. Here, a user selects music controls using eye movements.



Black Founders Fund

To help expand access to opportunity, the Black Founders Fund provided \$100,000 to entrepreneurs, including the ones shown here. Of participating founders, 78% report that the fund immediately helped grow their revenues.

Building an equitable and inclusive world for all is central to our mission, and over the course of the year, we deepened our efforts to drive meaningful change both within our own workplace and in the world beyond. In 2020, we announced a number of commitments to build a more inclusive and equitable workplace at Google, and we've made significant progress toward those goals. We set out to improve leadership representation of Black+, Latinx+, and Native American+ Googlers in the U.S. by 30% by 2025. Within one year, we've already reached our goal, and we're on track to double the number of Black+ Googlers at all other levels in the U.S. by 2025. Because it's critical for us to not just attract but also retain underrepresented employees, we piloted a new onboarding program designed to foster community and targeted support, including pairing new Black+ hires in the U.S. with mentors. We've seen positive results: So far, 80% of respondents said they would recommend the pilot.

3X retention investment

We expanded our Retention & Progression team and tripled our investment in their work.

Our responsibility to help build an inclusive world is why we aim to build products for everyone. With the launch of Pixel 6 and Pixel 6 Pro we unveiled a more equitable camera with Real Tone, software to more accurately represent people of color. We also launched Camera Switches, a new Android feature that improves accessibility by making it possible for anyone to use facial gestures to navigate their phone.

To promote equity and inclusion beyond Google, we made commitments to broaden access to opportunity. We granted \$50 million in unrestricted funding to Historically Black Colleges and Universities (HBCUs) so these institutions could invest in their communities, and we expanded the Grow with Google Career Readiness Program to bring digital skills training to students and job seekers across the U.S. The Google for Startups Black Founders Fund and Latino Founders Fund helped high-potential founders grow their businesses, and we're already seeing promising impact: The first \$10 million in awards created a powerful halo effect, helping those Black founders raise an additional \$75 million in venture capital. Recognizing that COVID-19 was quickly widening the gender equity gap, Google.org committed \$25 million to support 34 organizations lifting up women and girls around the world. With these efforts we sought to create immediate change and build the groundwork for a more equitable future.

“Pictures are a big part of how we see each other and the world around us, and historically racial bias in camera technology has overlooked and excluded people of color.”

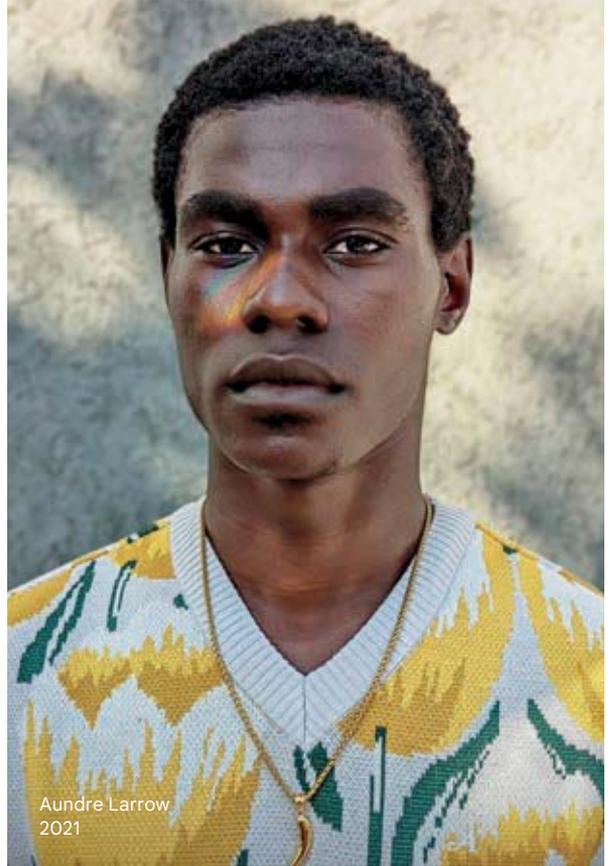
Florian Koenigsberger, Google Image Equity Lead on Real Tone, a series of key improvements for the Pixel 6 and Pixel 6 Pro across our face detection, camera, and editing products. In this effort to make more equitable camera and imaging products, Google partnered with a diverse range of image experts renowned for their beautiful and accurate imagery of people of color.

Photo credit: Noémie Tshinanga

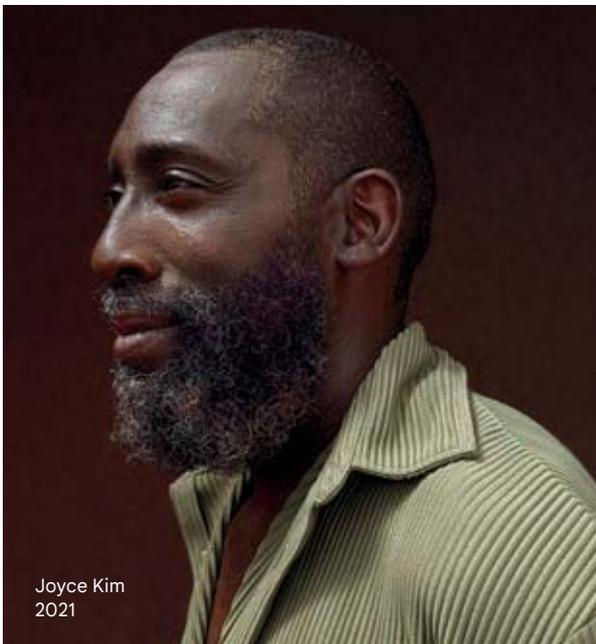




Sam Robinson
2021



Aundre Larrow
2021



Joyce Kim
2021

Real Tone

The Pixel 6 and Pixel 6 Pro cameras debuted Real Tone, software to address long-standing issues with how cameras represent people of color and create a more equitable tool.

Taking decisive action against the climate crisis

The climate crisis remains the greatest challenge of our time, one that we take on with ambitious thinking, new innovations, and sustained action. In 2021, we committed to achieve net-zero emissions by 2030 across all our operations and value chain, and as part of that, we have a goal to operate 24/7 on carbon-free energy for all our data centers and campuses by the end of the decade. That means we aim to deliver every search, every email, and every YouTube video without emitting carbon. It's a moonshot we're starting to make real—five of our data center sites are now operating near or at 90% carbon-free energy. Additionally, we've been innovating technology to optimize clean energy use and storage across data centers to run the cleanest cloud in the industry. Beyond these efforts, we signed contracts to purchase nearly a gigawatt of new carbon-free energy around the world, making Google the largest corporate purchaser of renewable energy on an annual basis.

Our new Bay View campus in Mountain View, California, embodies our aspiration to create workplaces that exceed the highest standards of sustainability. In order to help us reach our carbon-free energy goal, we needed to prioritize alternate sources of energy for the campus. Our dragonscale solar panels are one such innovation, a striking combination of form and function that envelops the roofs to power an estimated 40% of the campus.

In our products, we've launched new features to help a billion people make sustainable choices every day. Now, in addition to showing the fastest route, Google Maps will also display the one that's the most fuel efficient when the ETA is similar. In Google Flights, we introduced carbon emissions information so that people can see estimated carbon emissions per seat for nearly every flight and consider emissions right alongside cost and timing. At home, Nest thermostats now have a service called Nest Renew (currently in beta): Compatible Nest thermostats can help people automatically shift electricity usage for heating and cooling to times when energy is cleaner or less expensive.

For our partners, we supported their efforts to build a more sustainable future with our technology. Our Environmental Insights Explorer tool empowers city planners and policymakers with actionable climate-focused data, and in 2021, we expanded its Tree Canopy Insights. Trees help fight climate change by providing shade, lowering temperatures, and contributing cleaner air; this tool uses aerial imagery and advanced AI capabilities to identify places in a city that are at the greatest risk of experiencing rapidly rising temperatures. In expanding this tool to 100 cities, we helped city planners around the world take action to protect their communities.

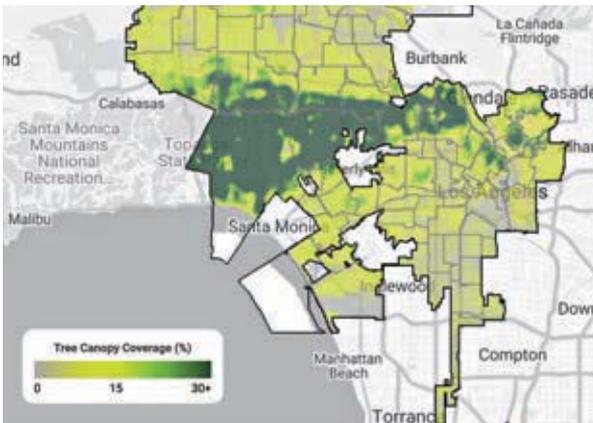


Solar panels

Our ambition to operate 24/7 on carbon-free energy requires substantial investment in clean energy sources, including this solar farm in Rødby, Denmark.

\$4B

As of April 2021, we have committed a total of \$4 billion to purchase clean energy from more than 50 wind and solar projects globally through 2034.



Tree Canopy

With Tree Canopy Insights in our Environmental Insights Explorer, city planners can monitor tree coverage in urban environments to determine where more trees are needed most to help fight climate change.

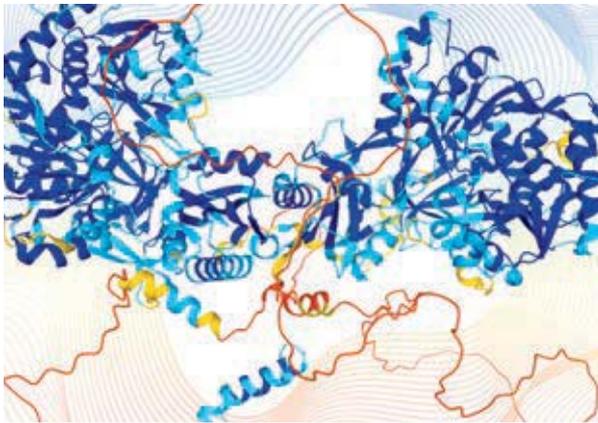


Dragonscale

Google's new Bay View campus in Mountain View embodies our commitment to operate sustainably, with dragonscale solar power roofs that serve as one of the main energy sources for the campus.

Photo credit: Christopher McAnney, Heatherwick Studio

Other bets



DeepMind

DeepMind released the AlphaFold Protein Structure Database in partnership with the European Molecular Biology Laboratory, more than doubling the number of high-accuracy human protein structures available to researchers. The database is already helping over 400,000 researchers across a huge variety of fields to accelerate their work, and now DeepMind plans to add over 100 million structures—almost every sequenced protein known to science.



Wing

Wing unveiled a new model for drone delivery that will allow expansion into densely populated metropolitan areas. Delivery drones will be staged at retail locations, ready to fly directly to customers. Wing has launched the model in Australia, and in the U.S., Walgreens will be the first retailer to use it.



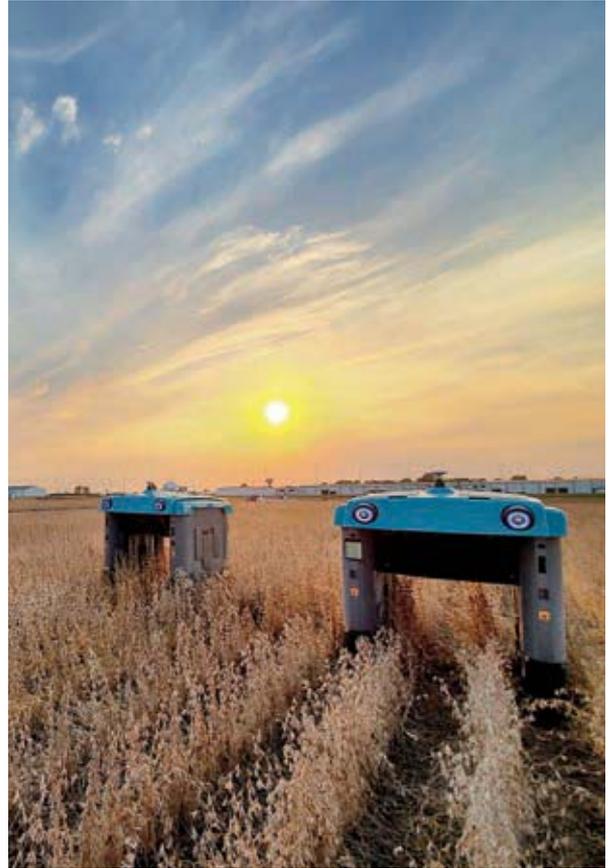
Waymo

2021 marked the one-year anniversary of Waymo One, Waymo's fully autonomous ride-hailing service in metro Phoenix that's served tens of thousands of rider-only trips to thousands of paying customers. Waymo also welcomed its first riders in San Francisco through the Waymo One Trusted Tester program, and throughout the year, Waymo Via delivered freight autonomously for key industry players, including J.B. Hunt and UPS.



Isomorphic Laboratories

We launched a new Alphabet company, Isomorphic Laboratories, a commercial venture that will take an AI-first approach to reimagining the entire drug discovery process from first principles, as well as modeling and understanding some of the fundamental mechanisms of life.



X

X continues to produce a compelling range of options for Alphabet's long-term future. These include Intrinsic, a new Alphabet company developing software tools to make industrial robots easier to use, less costly, and more flexible. Ambitious projects still in development include Taara, which is delivering high-speed, high-capacity connectivity over long distances, and moonshots for the electric grid (Tapestry), sustainable agriculture (Mineral), and ocean health (Tidal).

Directors and executive officers as of January 2022

Directors

Larry Page
Co-Founder

Sergey Brin
Co-Founder

Sundar Pichai
Chief Executive Officer,
Google and Alphabet

John L. Hennessy
Chair of the Board of Directors
Former President, Stanford University

Frances H. Arnold
Linus Pauling Professor of Chemical
Engineering, Bioengineering, and
Biochemistry, California Institute
of Technology

L. John Doerr
General Partner, Kleiner Perkins

Roger W. Ferguson Jr.
Former President and
Chief Executive Officer, TIAA

Ann Mather
Former Executive Vice President and
Chief Financial Officer, Pixar

Alan R. Mulally
Former Chief Executive Officer and
President, Ford Motor Company

K. Ram Shriram
Managing Partner, Sheralo Ventures

Robin L. Washington
Former Executive Vice President and
Chief Financial Officer, Gilead Sciences

Executive officers

Sundar Pichai
Chief Executive Officer,
Google and Alphabet

Ruth M. Porat
Senior Vice President and Chief Financial
Officer, Google and Alphabet

Philipp Schindler
Senior Vice President and
Chief Business Officer, Google

Prabhakar Raghavan
Senior Vice President,
Knowledge and Information, Google

J. Kent Walker
President, Global Affairs and
Chief Legal Officer, Alphabet and Google,
and Corporate Secretary, Alphabet

Stockholder information

For further information about
Alphabet Inc., contact:

Investor Relations

Alphabet Inc.
1600 Amphitheatre Parkway
Mountain View, CA 94043
investor-relations@abc.xyz

You may also reach us by visiting the
investor relations portion of our website at:
abc.xyz/investor/

Alphabet's stock (GOOG, GOOGL) trades
on the NASDAQ Global Select Market

Transfer Agent and Registrar

First-class/registered/certified mail:
Computershare Investor Services
P.O. Box 505000
Louisville, KY 40233-5000

Courier services:
Computershare Investor Services
462 South 4th Street, Suite 1600
Louisville, KY 40202-3467

Shareholder services numbers:
(866) 298-8535 (toll-free within the USA,
U.S. territories, and Canada) or
(781) 575-2879

Investor Centre™ Portal:
computershare.com/investor

Independent Registered Public
Accounting Firm
Ernst & Young LLP

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, D.C. 20549

FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2021

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
OR
For the transition period from _____ to _____.

(State or other jurisdiction of incorporation or organization) (Exact name of registrant as specified in its charter) Commission file number: (I.R.S. Employer Identification No.)
(Address of principal executive offices, including zip code) (Registrant's telephone number, including area code)

ALPHABET INC.

Delaware

1600 Amphitheatre Parkway
Mountain View, CA 94043
(650) 253-0000

001-37580

61-1767919

SECURITIES REGISTERED PURSUANT TO SECTION 12(B) OF THE ACT:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Class A Common Stock, \$0.001 par value	GOOGL	Nasdaq Stock Market LLC (Nasdaq Global Select Market)
Class C Capital Stock, \$0.001 par value	GOOG	Nasdaq Stock Market LLC (Nasdaq Global Select Market)

SECURITIES REGISTERED PURSUANT TO SECTION 12(G) OF THE ACT:

Title of each class
None

Indicate by check mark	Alphabet Inc.	
	YES	NO
• if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.	Large accelerated filer <input checked="" type="checkbox"/> Accelerated filer <input type="checkbox"/> Non-accelerated filer <input type="checkbox"/> Smaller reporting company <input type="checkbox"/> Emerging growth company <input type="checkbox"/>	
• If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.	<input type="checkbox"/>	
• whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C.7262(b)) by the registered public accounting firm that prepared or issued its audit report.	<input checked="" type="checkbox"/>	
• whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).	<input checked="" type="checkbox"/>	

As of June 30, 2021, the aggregate market value of shares held by non-affiliates of the registrant (based upon the closing sale prices of such shares on the Nasdaq Global Select Market on June 30, 2021) was approximately \$1,451.1 billion. For purposes of calculating the aggregate market value of shares held by non-affiliates, we have assumed that all outstanding shares are held by non-affiliates, except for shares held by each of our executive officers, directors and 5% or greater stockholders. In the case of 5% or greater stockholders, we have not deemed such stockholders to be affiliates unless there are facts and circumstances which would indicate that such stockholders exercise any control over our company, or unless they hold 10% or more of our outstanding common stock. These assumptions should not be deemed to constitute an admission that all executive officers, directors and 5% or greater stockholders are, in fact, affiliates of our company, or that there are not other persons who may be deemed to be affiliates of our company. Further information concerning shareholdings of our officers, directors and principal stockholders is included or incorporated by reference in Part III, Item 12 of this Annual Report on Form 10-K.

As of January 25, 2022, there were 300,754,904 shares of the registrant's Class A common stock outstanding, 44,576,938 shares of the registrant's Class B common stock outstanding, and 315,639,479 shares of the registrant's Class C capital stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the 2022 Annual Meeting of Stockholders are incorporated herein by reference in Part III of this Annual Report on Form 10-K to the extent stated herein. Such proxy statement will be filed with the Securities and Exchange Commission within 120 days of the registrant's fiscal year ended December 31, 2021.

Alphabet Inc.
Form 10-K
For the Fiscal Year Ended December 31, 2021

Table of Contents

NOTE ABOUT FORWARD-LOOKING STATEMENTS	ii
PART I	
ITEM 1. BUSINESS	1
ITEM 1A. RISK FACTORS	6
ITEM 1B. UNRESOLVED STAFF COMMENTS	20
ITEM 2. PROPERTIES	20
ITEM 3. LEGAL PROCEEDINGS	20
ITEM 4. MINE SAFETY DISCLOSURES	20
PART II	
ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES	21
ITEM 6. [RESERVED]	23
ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS	24
ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK	38
ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA	40
ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE	82
ITEM 9A. CONTROLS AND PROCEDURES	83
ITEM 9B. OTHER INFORMATION	84
ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS	85
PART III	
ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE	86
ITEM 11. EXECUTIVE COMPENSATION	86
ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS	86
ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE	87
ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES	87
PART IV	
ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES	88
ITEM 16. FORM 10-K SUMMARY	91
SIGNATURES	92

NOTE ABOUT FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. These include, among other things, statements regarding:

- the ongoing effect of the novel coronavirus pandemic (“COVID-19”), including its macroeconomic effects on our business, operations, and financial results;
 - the growth of our business and revenues and our expectations about the factors that influence our success and trends in our business;
 - fluctuations in our revenue growth rate and operating margin and various factors contributing to such fluctuations;
 - our expectation that the continuing shift from an offline to online world will continue to benefit our business;
 - our expectation that the portion of our revenues that we derive from non-advertising revenues will continue to increase and may affect our margins;
 - our expectation that our traffic acquisition costs (TAC) and the associated TAC rate will fluctuate, which could affect our overall margins;
 - our expectation that our monetization trends will fluctuate, which could affect our revenues and margins;
 - fluctuations in our revenue growth, as well as the change in paid clicks and cost-per-click and the change in impressions and cost-per-impression, and various factors contributing to such fluctuations;
 - our expectation that we will continue to periodically review, refine, and update our methodologies for monitoring, gathering, and counting the number of paid clicks and impressions;
 - our expectation that our results will be affected by our performance in international markets as users in developing economies increasingly come online;
 - our expectation that our foreign exchange risk management program will not fully offset our net exposure to fluctuations in foreign currency exchange rates;
 - the expected variability of gains and losses related to hedging activities under our foreign exchange risk management program;
 - the amount and timing of revenue recognition from customer contracts with commitments for performance obligations, including our estimate of the remaining amount of commitments and when we expect to recognize revenue;
 - fluctuations in our capital expenditures;
 - our plans to continue to invest in new businesses, products, services and technologies, systems, land and buildings for data centers and offices, and infrastructure, as well as to continue to invest in acquisitions and strategic investments;
 - our pace of hiring and our plans to provide competitive compensation programs;
 - our expectation that our cost of revenues, research and development (R&D) expenses, sales and marketing expenses, and general and administrative expenses may increase in amount and/or may increase as a percentage of revenues and may be affected by a number of factors;
 - estimates of our future compensation expenses;
 - our expectation that our other income (expense), net (OI&E), will fluctuate in the future, as it is largely driven by market dynamics;
 - fluctuations in our effective tax rate;
 - seasonal fluctuations in internet usage and advertiser expenditures, underlying business trends such as traditional retail seasonality, which are likely to cause fluctuations in our quarterly results;
 - the sufficiency of our sources of funding;
 - our potential exposure in connection with new and pending investigations, proceedings, and other contingencies;
 - the sufficiency and timing of our proposed remedies in response to decisions from the European Commission (EC) and other regulators and governmental entities;
 - our expectations regarding the timing, design, and ongoing phased implementation of our new global enterprise resource planning (ERP) system;
 - the expected timing, amount, and effect of Alphabet Inc.’s share repurchases;
 - our long-term sustainability and diversity goals;
- as well as other statements regarding our future operations, financial condition and prospects, and business strategies. Forward-looking statements may appear throughout this report and other documents we file with the Securities and Exchange Commission (SEC), including without limitation, the following sections: Part I, Item 1 “Business;” Part I, Item 1A “Risk Factors;” and Part II, Item 7 “Management’s Discussion and Analysis of Financial Condition and Results of Operations.” Forward-looking statements generally can be identified by words such as “anticipates,” “believes,” “estimates,” “expects,” “intends,” “plans,” “predicts,” “projects,” “will be,” “will continue,” “may,” “could,” “will likely result,” and similar expressions. These forward-looking statements are based on current expectations and assumptions that are subject to risks and uncertainties, which could cause our actual results to differ materially from those reflected in the forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those discussed in this Annual Report on Form 10-K, and in particular, the risks discussed in Part I, Item 1A, “Risk Factors” of this report and those discussed in other documents we file with the SEC. We undertake no obligation to revise or publicly release the results of any revision to these forward-looking statements, except as required by law. Given these risks and uncertainties, readers are cautioned not to place undue reliance on such forward-looking statements.
- As used herein, “Alphabet,” “the company,” “we,” “us,” “our,” and similar terms include Alphabet Inc. and its subsidiaries, unless the context indicates otherwise.
- “Alphabet,” “Google,” and other trademarks of ours appearing in this report are our property. This report contains additional trade names and trademarks of other companies. We do not intend our use or display of other companies’ trade names or trademarks to imply an endorsement or sponsorship of us by such companies, or any relationship with any of these companies.

● PART I

— ITEM 1. BUSINESS

Overview

As our founders Larry and Sergey wrote in the original founders' letter, "Google is not a conventional company. We do not intend to become one." That unconventional spirit has been a driving force throughout our history, inspiring us to tackle big problems and invest in moonshots like artificial intelligence (AI) research and quantum computing. We continue this work under the leadership of Sundar Pichai, who has served as CEO of Google since 2015 and as CEO of Alphabet since 2019.

Alphabet is a collection of businesses — the largest of which is Google. We report Google in two segments, Google Services and Google Cloud; we also report all non-Google businesses collectively as Other Bets. Other Bets include earlier stage technologies that are further afield from our core Google business. We take a long-term view and manage the portfolio of Other Bets with the discipline and rigor needed to deliver long-term returns. Alphabet's structure is about helping each of our businesses prosper through strong leaders and independence.

Access and technology for everyone

The Internet is one of the world's most powerful equalizers; it propels ideas, people and businesses large and small. Our mission to organize the world's information and make it universally accessible and useful is as relevant today as it was when we were founded in 1998. Since then, we have evolved from a company that helps people find answers to a company that also helps people get things done.

We are focused on building an even more helpful Google for everyone, and we aspire to give everyone the tools they need to increase their knowledge, health, happiness, and success. Every year, there are trillions of searches on Google, and 15% of the searches we see every day are new. We continue to invest deeply in AI and other technologies to ensure the most helpful search experience possible. YouTube provides people with entertainment, information, and opportunities to learn something new. And Google Assistant offers the best way to get things done seamlessly across different devices, providing intelligent help throughout a person's day, no matter where they are.

We are continually innovating and building new product features that will help our users, partners, customers, and communities. We have invested more than \$100 billion in R&D over the last five years. In addition, with the onset of the pandemic, we have focused in particular on features that help people in their daily lives and that support businesses working to serve their customers. For example, we have added live busyness trends in Google Maps that help users instantly spot when a neighborhood or part of town is near or at its busiest. We have also helped businesses navigate uncertainty during an uneven economic recovery, and we have worked to address the complex challenge of distributing critical information about COVID-19 vaccines to billions of people around the world. Importantly, we have made authoritative content a key focus area across both Google Search and YouTube to help users find trusted public health information.

Other Bets also remain focused on innovation through technology that can positively affect people's lives. For instance, Waymo is working toward our goal of making transportation safer and easier for everyone and Verily is developing tools and platforms to improve health outcomes.

Moonshots

Many companies get comfortable doing what they have always done, making only incremental changes. This incrementalism leads to irrelevance over time, especially in technology, where change tends to be revolutionary, not evolutionary. People thought we were crazy when we acquired YouTube and Android and when we launched Chrome, but those efforts have matured into major platforms for digital video and mobile devices and a safer, popular browser. We continue to look toward the future and to invest for the long term within each of our segments. As we said in the original founders' letter, we will not shy away from high-risk, high-reward projects that we believe in, as they are the key to our long-term success.

The power of AI

Across the company, investments in AI and machine learning are increasingly driving many of our latest innovations and have enabled us to build products that are smarter and more helpful. For example, in May of 2021, we introduced Multitask Unified Model — or MUM — which has the potential to transform how Google helps with complex tasks. MUM is trained across 75 different languages, which means that it can learn from sources written in one language and help bring that information to people in another. It is also multimodal, so it understands information across text and images and, in the future, can expand to more modalities like video and audio. We are currently experimenting with MUM's capabilities to make searching more natural and intuitive and even enable entirely new ways to search.

DeepMind also made a significant AI-powered breakthrough, solving a 50-year-old protein folding challenge, which will help the world better understand one of life's fundamental building blocks, and will enable researchers to tackle new and difficult problems, from fighting diseases to environmental sustainability. DeepMind has since shared its new AlphaFold protein structure database, which doubled the number of high-accuracy human protein structures available to researchers.

Google

For reporting purposes, Google comprises two segments: Google Services and Google Cloud.

Google Services

SERVING OUR USERS

We have always been a company committed to building helpful products that can improve the lives of millions of people. Our product innovations have made our services widely used, and our brand one of the most recognized in the world. Google Services' core products and platforms include ads, Android, Chrome, hardware, Gmail, Google Drive, Google Maps, Google Photos, Google Play, Search, and YouTube, each with broad and growing adoption by users around the world.

Our products and services have come a long way since the company was founded more than two decades ago. Rather than the ten blue links in our early search results, users can now get direct answers to their questions using their computer, mobile device, or their own voice, making it quicker, easier and more natural to find what they are looking for.

This drive to make information more accessible and helpful has led us over the years to improve the discovery and creation of digital content both on the web and through platforms like Google Play and YouTube. With the continued adoption of mobile, people are consuming more digital content by watching more videos, playing more games, listening to more music, reading more books, and using more apps than ever before. Working with content creators and partners, we continue to build new ways for people around the world to find great digital content.

Fueling all of these great digital experiences are extraordinary platforms and hardware. That is why we continue to invest in platforms like our Android mobile operating system, Chrome browser, and Chrome operating system, as well as growing our family of hardware devices. We see tremendous potential for devices to be helpful and make people's lives easier by combining the best of our AI, software and hardware. This potential is reflected in our latest generation of hardware products such as Pixel 5a 5G and Pixel 6 phones, the Fitbit Charge 5, Chromecast with Google TV, and the new Google Nest Cams and Nest Doorbell. Creating products that people rely on every day is a journey that we are investing in for the long run.

The key to building helpful products for users is our commitment to privacy, security, and user choice. We protect user privacy and security with products that are secure by default and private by design, and that keep users in control of their data. Our privacy-preserving technologies safeguard individual privacy and enhance data protection. As the Internet evolves, so does our approach to privacy and security. We continue to enhance our anti-malware features in Chrome and drive improvements such as auto-delete controls that automatically delete web and app searches after 18 months. And we continue to keep users and their passwords safe through advances like our built-in password manager.

HOW WE MAKE MONEY

We have built world-class advertising technologies for advertisers, agencies, and publishers to power their digital marketing businesses. Our advertising solutions help millions of companies grow their businesses through our wide range of products across devices and formats, and we aim to ensure positive user experiences by serving the right ads at the right time and by building deep partnerships with brands and agencies.

Google Services generates revenues primarily by delivering both performance and brand advertising that appears on Google Search & other properties, YouTube and Google Network partners' properties ("Google Network properties"). We continue to invest in both performance and brand advertising and seek to improve the measurability of advertising so advertisers understand the effectiveness of their campaigns.

- **Performance advertising** creates and delivers relevant ads that users will click on, leading to direct engagement with advertisers. Performance advertising lets our advertisers connect with users while driving measurable results. Our ads tools allow performance advertisers to create simple text-based ads.
- **Brand advertising** helps enhance users' awareness of and affinity for advertisers' products and services, through videos, text, images, and other interactive ads that run across various devices. We help brand advertisers deliver digital videos and other types of ads to specific audiences for their brand-building marketing campaigns.

We have allocated substantial resources to stopping bad advertising practices and protecting users on the web. We focus on creating the best advertising experiences for our users and advertisers in many ways, including filtering out invalid traffic, removing billions of bad ads from our systems every year, and closely monitoring the sites, apps, and videos where ads appear and blocklisting them when necessary to ensure that ads do not fund bad content.

We continue to look to the future and are making long-term investments that we expect to grow revenues beyond advertising, including revenues from Google Play, hardware, and YouTube non-advertising.

- **Google Play** generates revenues from sales of apps and in-app purchases and digital content sold in the Google Play store.
- **Hardware** generates revenues from sales of Fitbit wearable devices, Google Nest home products, Pixel phones, and other devices.
- **YouTube non-advertising** generates revenues from YouTube Premium and YouTube TV subscriptions and other services.

Google Cloud

Google was a company built in the cloud. We continue to invest in infrastructure, security, data management, analytics, and AI. We see significant opportunity in helping businesses utilize these strengths with features like data migration, modern development environments, and machine learning tools to provide enterprise-ready cloud services, including Google Cloud Platform and Google Workspace. Google Cloud Platform enables developers to build, test, and deploy applications on its highly scalable and reliable infrastructure. Google Workspace collaboration tools — which include apps like Gmail, Docs, Drive, Calendar, Meet and more — are designed with real-time collaboration and machine intelligence to help people work smarter. Because more and more of today's digital experiences are being built in the cloud, Google Cloud products help businesses of all sizes take advantage of the latest technology advances to operate more efficiently.

- **Google Cloud Platform** generates revenues from infrastructure, platform and other services.
- **Google Workspace** generates revenues from cloud-based collaboration tools for enterprises, such as Gmail, Docs, Drive, Calendar and Meet.

Our cloud services are generally provided on either a consumption or subscription basis and may have contract terms longer than a year.

Other Bets

Across Alphabet, we are also using technology to try to solve big problems that affect a wide variety of industries. Alphabet's investment in the portfolio of Other Bets includes emerging businesses at various stages of development, ranging from those in the R&D phase to those that are in the beginning stages of commercialization, and our goal is for them to become thriving, successful businesses in the medium to long term. While these early-stage businesses naturally come with considerable uncertainty, some of them are already generating revenue and making important strides in their industries. Revenues from Other Bets are generated primarily from the sale of health technology and internet services.

Other Bets operate as independent companies and some of them have their own boards with independent members and outside investors. We are investing in the portfolio of Other Bets and being very deliberate about the focus, scale, and pace of investments.

Competition

Our business is characterized by rapid change as well as new and disruptive technologies. We face formidable competition in every aspect of our business, including from:

- General purpose search engines and information services, such as Baidu, Microsoft's Bing, Naver, Seznam, Yahoo, and Yandex.
- Vertical search engines and e-commerce providers, such as Amazon and eBay (e-commerce), Booking's Kayak (travel queries), Microsoft's LinkedIn (job queries), and WebMD (health queries). Some users will navigate directly to such content, websites, and apps rather than go through Google.
- Social networks offered by ByteDance, Meta, Snap, and Twitter. Some users increasingly rely on social networks for product or service referrals, rather than seeking information through traditional search engines.
- Other online advertising platforms and networks, such as Amazon, AppNexus, Criteo, and Meta, that compete for advertisers that use Google Ads, our primary auction-based advertising platform.
- Other forms of advertising, such as billboards, magazines, newspapers, radio, and television. Our advertisers typically advertise in multiple media, both online and offline.
- Companies that design, manufacture, and market consumer hardware products, including businesses that have developed proprietary platforms, such as Amazon, Apple, and Microsoft.
- Digital assistant providers, such as Amazon and Apple.
- Providers of enterprise cloud services, such as Alibaba, Amazon, Microsoft, and Salesforce.
- Providers of digital video services, such as Amazon, Apple, AT&T, ByteDance, Disney, Hulu, Meta, and Netflix.
- Other digital content and application platform providers, such as Amazon and Apple.

- Providers of workspace connectivity and productivity products, such as Meta, Microsoft, Salesforce, and Zoom.

Competing successfully depends heavily on our ability to develop and distribute innovative products and technologies to the marketplace across our businesses. Specifically, for advertising, competing successfully depends on attracting and retaining:

- users, for whom other products and services are literally one click away, largely on the basis of the relevance of our advertising, as well as the general usefulness, security, and availability of our products and services;
- advertisers, primarily based on our ability to generate sales leads, and ultimately customers, and to deliver their advertisements in an efficient and effective manner across a variety of distribution channels; and
- content providers, primarily based on the quality of our advertiser base, our ability to help these partners generate revenues from advertising, and the terms of our agreements with them.

For additional information about competition, see Risk Factors in Item 1A of this Annual Report on Form 10-K.

Ongoing Commitment to Sustainability

We believe that every business has the opportunity and obligation to protect our planet. Sustainability is one of our core values at Google, and we strive to build sustainability into everything we do. We have been a leader on sustainability and climate change since Google's founding over 20 years ago. These are some of our key achievements over the past two decades:

- In 2007, we became the first major company to be carbon neutral for our operations.
- In 2017, we became the first major company to match 100% of our annual electricity use with renewable energy, which we have achieved for four consecutive years.
- In 2020, we issued \$5.75 billion in sustainability bonds—the largest sustainability or green bond issuance by any company in history at the time. The net proceeds from the issuance are used to fund environmentally and socially responsible projects in the following eight areas: energy efficiency, clean energy, green buildings, clean transportation, circular economy and design, affordable housing, commitment to racial equity, and support for small businesses and COVID-19 crisis response. As of December 31, 2020, we have allocated \$3.47 billion of the net proceeds, as outlined in our Sustainability Bond Impact Report published in 2021.
- Also in 2020, we compensated for our legacy carbon footprint, making Google the first major company to be carbon neutral for its entire operating history.

Our sustainability strategy is focused on three key pillars: accelerating the transition to carbon-free energy and a circular economy, empowering everyone with technology, and benefiting the people and places where we operate.

To accelerate the transition to a carbon-free economy, in 2020, we launched our third decade of climate action, and we are now working toward a new set of ambitious goals. By 2030, we aim to:

- achieve net-zero emissions across all of our operations and value chain;
- become the first major company to run on carbon-free energy 24 hours a day, seven days a week, 365 days a year;
- enable 5 gigawatts of new carbon-free energy through investments in our key manufacturing regions; and
- help more than 500 cities and local governments reduce an aggregate of 1 gigaton of carbon emissions annually.

To accelerate the transition to a circular economy, we are working to maximize the reuse of finite resources across our operations, products, and supply chains and to enable others to do the same. We are also working to empower everyone with technology by committing to help 1 billion people make more sustainable choices by the end of 2022 through our core products.

To benefit the people and places where we operate, we have set goals to replenish more water than we consume by 2030 and to support water security in communities where we operate. We will focus on three areas: enhancing our stewardship of water resources across Google office campuses and data centers; replenishing our water use and improving watershed health and ecosystems in water-stressed communities; and sharing technology and tools that help everyone predict, prevent, and recover from water stress.

We remain steadfast in our commitment to sustainability, and we will continue to lead and encourage others to join us in improving the health of our planet. We are proud of what we have achieved so far, and we are energized to help move the world closer to a more sustainable and carbon-free future for all.

More information on our approach to sustainability can be found in our annual sustainability reports, including Google's Environmental Report and Alphabet's 2021 Sustainability Bond Impact Report, which outlines the allocation of our net proceeds from our sustainability bonds. The contents of our sustainability reports are not incorporated by reference into this Annual Report on Form 10-K or in any other report or document we file with the SEC. For additional information about risks and uncertainties applicable to our commitments to attain certain sustainability goals, see Risk Factors in Item 1A of this Annual Report on Form 10-K.

Culture and Workforce

We are a company of curious, talented, and passionate people. We embrace collaboration and creativity, and encourage the iteration of ideas to address complex challenges in technology and society.

Our people are critical for our continued success, so we work hard to create an environment where employees can have fulfilling careers, and be happy, healthy, and productive. We offer industry-leading benefits and programs to take care of the diverse needs of our employees and their families, including opportunities for career growth and development, resources to support their financial health, and access to excellent healthcare choices. Our competitive compensation programs help us to attract and retain top candidates, and we will continue to invest in recruiting talented people to technical and non-technical roles, and rewarding them well. We provide a variety of high quality training and support to our managers to build and strengthen their capabilities—ranging from courses for new managers, to learning resources that help them provide feedback and manage performance, to coaching and individual support.

At Alphabet, we are committed to making diversity, equity, and inclusion part of everything we do and to growing a workforce that is representative of the users we serve. More information on Google's approach to diversity can be found in our annual diversity reports, available publicly at diversity.google. The contents of our diversity reports are not incorporated by reference into this Annual Report on Form 10-K or in any other report or document we file with the SEC.

As of December 31, 2021, Alphabet had 156,500 employees. We have work councils and statutory employee representation obligations in certain countries, and we are committed to supporting protected labor rights, maintaining an open culture and listening to all employees. Supporting healthy and open dialogue is central to how we work, and we communicate information about the company through multiple internal channels to our employees.

When necessary, we contract with businesses around the world to provide specialized services where we do not have appropriate in-house expertise or resources, often in fields that require specialized training like cafe operations, content moderation, customer support, and physical security. We also contract with temporary staffing agencies when we need to cover short-term leaves, when we have spikes in business needs, or when we need to quickly incubate special projects. We choose our partners and staffing agencies carefully, and review their compliance with Google's Supplier Code of Conduct. We continually make improvements to promote a respectful and positive working environment for everyone — employees, vendors, and temporary staff alike.

Government Regulation

We are subject to numerous United States (U.S.) federal, state, and foreign laws and regulations covering a wide variety of subject matters. Like other companies in the technology industry, we face heightened scrutiny from both U.S. and foreign governments with respect to our compliance with laws and regulations. Many of these laws and regulations are evolving and their applicability and scope, as interpreted by the courts, remain uncertain.

Our compliance with these laws and regulations may be onerous and could, individually or in the aggregate, increase our cost of doing business, make our products and services less useful, limit our ability to pursue certain business models, cause us to change our business practices, affect our competitive position relative to our peers, and/or otherwise have an adverse effect on our business, reputation, financial condition, and operating results.

For additional information about government regulation applicable to our business, see Risk Factors in Item 1A, Trends in Our Business and Financial Effect in Part II, Item 7, and Legal Matters in Note 10 of the Notes to Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K.

Intellectual Property

We rely on various intellectual property laws, confidentiality procedures and contractual provisions to protect our proprietary technology and our brand. We have registered, and applied for the registration of, U.S. and international trademarks, service marks, domain names and copyrights. We have also filed patent applications in the U.S. and foreign countries covering certain of our technology, and acquired patent assets to supplement our portfolio. We have licensed in the past, and expect that we may license in the future, certain of our rights to other parties. For additional information, see Risk Factors in Item 1A of this Annual Report on Form 10-K.

Available Information

Our website is located at www.abc.xyz, and our investor relations website is located at www.abc.xyz/investor. Our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and our Proxy Statements, and any amendments to these reports, are available through our investor relations website, free of charge, after we file them with the SEC. We also provide a link to the section of the SEC's website at www.sec.gov that has all of the reports that we file or furnish with the SEC.

We webcast via our investor relations website our earnings calls and certain events we participate in or host with members of the investment community. Our investor relations website also provides notifications of news or announcements regarding our financial performance and other items that may be material or of interest to our investors, including SEC filings, investor events, press and earnings releases, and blogs. We also share Google news and product updates on Google's Keyword blog at <https://www.blog.google/>, that may be material or of interest to our investors. Further, corporate governance information, including our certificate of incorporation, bylaws, governance guidelines, board committee charters, and code of conduct, is also available on our investor relations website under the heading "Other." The contents of our websites are not incorporated by reference into this Annual Report on Form 10-K or in any other report or document we file with the SEC, and any references to our websites are intended to be inactive textual references only.

— ITEM 1A. RISK FACTORS

Our operations and financial results are subject to various risks and uncertainties, including but not limited to those described below, which could harm our business, reputation, financial condition, and operating results, and affect the trading price of our Class A and Class C stock.

Risks Specific to our Company

We generate a significant portion of our revenues from advertising, and reduced spending by advertisers, a loss of partners, or new and existing technologies that block ads online and/or affect our ability to customize ads could harm our business.

We generated more than 80% of total revenues from the display of ads online in 2021. Many of our advertisers, companies that distribute our products and services, digital publishers, and content providers can terminate their contracts with us at any time. These partners may not continue to do business with us if we do not create more value (such as increased numbers of users or customers, new sales leads, increased brand awareness, or more effective monetization) than their available alternatives. Changes to our advertising policies and data privacy practices, as well as changes to other companies' advertising and/or data privacy practices have in the past, and may in the future, affect the advertising that we are able to provide, which could harm our business. In addition, technologies have been developed that make customized ads more difficult or that block the display of ads altogether and some providers of online services have integrated technologies that could potentially impair the availability and functionality of third-party digital advertising. Failing to provide superior value or deliver advertisements effectively and competitively could harm our reputation, financial condition, and operating results.

In addition, expenditures by advertisers tend to be cyclical, reflecting overall economic conditions and budgeting and buying patterns. Adverse macroeconomic conditions have affected, and may in the future affect, the demand for advertising, resulting in fluctuations in the amounts our advertisers spend on advertising, which could harm our financial condition and operating results.

We face intense competition. If we do not continue to innovate and provide products and services that are useful to users, customers, and other partners, we may not remain competitive, which could harm our business and operating results.

Our business environment is rapidly evolving and intensely competitive. Our businesses face changing technologies, shifting user needs, and frequent introductions of rival products and services. To compete successfully, we must accurately anticipate technology developments and deliver innovative, relevant and useful products, services, and technologies in a timely manner. As our businesses evolve, the competitive pressure to innovate will encompass a wider range of products and services. We must continue to invest significant resources in R&D, including through acquisitions, in order to enhance our technology and new and existing products and services.

We have many competitors in different industries. Our current and potential domestic and international competitors range from large and established companies to emerging start-ups. Some competitors have longer operating histories and well established relationships in various sectors. They can use their experience and resources in ways that could affect our competitive position, including by making acquisitions, continuing to invest heavily in R&D and in talent, aggressively initiating intellectual property claims (whether or not meritorious), and continuing to compete aggressively for users, advertisers, customers, and content providers. Further, discrepancies in enforcement of existing laws may enable our lesser known competitors to aggressively interpret those laws without commensurate scrutiny, thereby affording them competitive advantages. Our competitors may also be able to innovate and provide products and services faster than we can or may foresee the need for products and services before us.

Our operating results may also suffer if our products and services are not responsive to the needs of our users, advertisers, publishers, customers, and content providers. As technologies continue to develop, our competitors may be able to offer experiences that are, or that are seen to be, substantially similar to or better than ours. This may force us to compete in different ways and expend significant resources in order to remain competitive. If our competitors are more successful than we are in providing compelling products and services or in attracting and retaining users, advertisers, publishers, customers, and content providers, our operating results could be harmed.

Our ongoing investment in new businesses, products, services, and technologies is inherently risky, and could divert management attention and harm our financial condition and operating results.

We have invested and expect to continue to invest in new businesses, products, services, and technologies. The investments that we are making across Google Services, Google Cloud, and Other Bets reflect our ongoing efforts to innovate and provide products and services that are useful to users, advertisers, publishers, customers, and content providers. Our investments in Google Services, Google Cloud, and Other Bets span a wide range of industries beyond online advertising. Such investments ultimately may not be commercially viable or may not result in an adequate return of capital and, in pursuing new strategies, we may incur unanticipated liabilities. These endeavors may involve significant risks and uncertainties, including diversion of resources and management attention from current operations and, with respect to Other Bets, the use of alternative investment, governance, or compensation structures that may fail to adequately align incentives across the company or otherwise accomplish their objectives.

Within Google Services, we continue to invest heavily in hardware, including our smartphones, home devices, and wearables, which is a highly competitive market with frequent introduction of new products and services, rapid adoption of technological advancements by competitors, short product life cycles, evolving industry standards, continual improvement in product price and performance characteristics, and price and feature sensitivity on the part of consumers and businesses. There can be no assurance we will be able to provide hardware that competes effectively.

Within Google Cloud, we devote significant resources to develop and deploy our enterprise-ready cloud services, including Google Cloud Platform and Google Workspace. We are incurring costs to build and maintain infrastructure to support cloud computing services and hire talent, particularly to support and scale our salesforce. At the same time, our competitors are rapidly developing and deploying cloud-based services. Pricing and delivery models are competitive and evolving, and we may not attain sufficient scale and profitability to achieve our business objectives.

Within Other Bets, we are investing significantly in the areas of health, life sciences, and transportation, among others. These investment areas face intense competition from large, experienced, and well-funded competitors and our offerings may not be able to compete effectively or to operate at sufficient levels of profitability.

In addition, new and evolving products and services, including those that use AI and machine learning, raise ethical, technological, legal, regulatory, and other challenges, which may negatively affect our brands and demand for our products and services. Because all of these new ventures are inherently risky, no assurance can be given that such strategies and offerings will be successful and will not harm our reputation, financial condition, and operating results.

Our revenue growth rate could decline over time, and we anticipate downward pressure on our operating margin in the future.

Our revenue growth rate could decline over time as a result of a number of factors, including increasing competition. Changes in device mix, geographic mix, ongoing product and policy changes, product mix, and property mix and an increasing competition for advertising may also affect our advertising revenue growth rate. We may also experience a decline in our revenue growth rate as our revenues increase to higher levels, if there is a decrease in the rate of adoption of our products, services, and technologies, or due to deceleration or decline in demand for devices used to access our services, among other factors.

In addition, we may also experience downward pressure on our operating margin resulting from a variety of factors, such as the continued expansion of our business into new fields, including products and services such as hardware, Google Cloud, and subscription products, as well as significant investments in Other Bets, all of which may have margins lower than those we generate from advertising. We may also experience downward pressure on our operating margins from increasing regulations, increasing competition, and increased costs for many aspects of our business. Due to these factors and the evolving nature of our business, our historical revenue growth rate and historical operating margin may not be indicative of our future performance. For additional information, see Trends in Our Business and Financial Effect in Part II, Item 7 of this Annual Report on Form 10-K.

Our intellectual property rights are valuable, and any inability to protect them could reduce the value of our products, services, and brands as well as affect our ability to compete.

Our patents, trademarks, trade secrets, copyrights, and other intellectual property rights are important assets for us. Various events outside of our control pose a threat to our intellectual property rights, as well as to our products, services, and technologies. For example, effective intellectual property protection may not be available in every country in which our products and services are distributed or made available through the Internet. Also, the efforts we have taken to protect our proprietary rights may not be sufficient or effective. Although we seek to obtain patent protection for our innovations, it is possible we may not be able to protect some of these innovations. Moreover, we may not have adequate patent or copyright protection for certain innovations that later turn out to be important. There is always the possibility that the scope of the protection gained will be insufficient or that an issued patent may be deemed invalid or unenforceable.

We also seek to maintain certain intellectual property as trade secrets. The secrecy of such trade secrets and other sensitive information could be compromised, which could cause us to lose the competitive advantage resulting from these trade secrets. We also face risks associated with our trademarks. For example, there is a risk that the word "Google" could become so commonly used that it becomes synonymous with the word "search." Some courts have ruled that "Google" is a protectable trademark, but it is possible that other courts, particularly those outside of the U.S., may reach a different determination. If this happens, we could lose protection for this trademark, which could result in other people using the word "Google" to refer to their own products, thus diminishing our brand.

Any significant impairment of our intellectual property rights could harm our business and our ability to compete. Also, protecting our intellectual property rights is costly and time consuming. Any increase in the unauthorized use of our intellectual property could make it more expensive to do business and harm our operating results.

Our business depends on strong brands, and failing to maintain and enhance our brands would hurt our ability to expand our base of users, advertisers, customers, content providers, and other partners.

Our strong brands have significantly contributed to the success of our business. Maintaining and enhancing the brands within Google Services, Google Cloud, and Other Bets increases our ability to enter new categories and launch new and innovative products and services that better serve the needs of our users, advertisers, customers, content providers, and other partners. Our brands have been, and may in the future be, negatively affected by a number of factors, including, among others, reputational issues, third-party content shared on our platforms, data privacy and security issues and developments, and product or technical performance failures. For example, if we fail to respond appropriately to the sharing of misinformation or objectionable content on our services and/or products or objectionable practices by advertisers, or otherwise to adequately address user concerns, our users may lose confidence in our brands.

Furthermore, failure to maintain and enhance equity in our brands may harm our business, financial condition, and operating results. Our success will depend largely on our ability to remain a technology leader and continue to provide high-quality, trustworthy, innovative products and services that are truly useful and play a valuable role in a range of settings.

We face a number of manufacturing and supply chain risks that could harm our financial condition, operating results, and prospects.

We face a number of risks related to manufacturing and supply chain management, which could affect our ability to supply both our products and our internet-based services.

We rely on other companies to manufacture many of our finished products; to design certain of our components and parts; to participate in the distribution of our products and services; and to design, manufacture, or assemble certain components and parts in our technical infrastructure. Our business could be negatively affected if we are not able to engage these companies with the necessary capabilities or capacity on reasonable terms, or if those we engage fail to meet their obligations (whether due to financial difficulties or other reasons), or make adverse changes in the pricing or other material terms of our arrangements with them.

We have experienced and/or may in the future experience supply shortages and/or price increases that could negatively affect our operations, driven by raw material, component or part availability, manufacturing capacity, labor shortages, industry allocations, logistics capacity, tariffs, trade disputes and barriers, natural disasters or pandemics, the effects of climate change (such as sea level rise, drought, flooding, heat waves, wildfires and resultant air quality effects and power shutoffs associated with wildfire prevention, and increased storm severity), and significant changes in the financial or business condition of our suppliers. In addition, some of the components we use in our technical infrastructure and products are available from only one or limited sources, and we may not be able to find replacement vendors on favorable terms in the event of a supply chain disruption. In addition, a significant supply interruption that affects us or our vendors could delay critical data center upgrades or expansions and delay product availability.

We may enter into long-term contracts for materials and products that commit us to significant terms and conditions. We may be liable for materials and products that are not consumed due to market acceptance, technological change, obsolescences, quality, product recalls, and warranty issues. For instance, because certain of our hardware supply contracts have volume-based pricing or minimum purchase requirements, if the volume of our hardware sales decreases or does not reach projected targets, we could face increased materials and manufacturing costs or other financial liabilities that could make our products more costly per unit to manufacture and negatively affect our financial results. Furthermore, certain of our competitors may negotiate more favorable contractual terms based on volume and other commitments that may provide them with competitive advantages and may affect our supply.

Our products and services have had, and in the future may have, quality issues resulting from design, manufacturing, or operations. Sometimes, these issues may be caused by components we purchase from other manufacturers or suppliers. If the quality of our products and services does not meet expectations or our products or services are defective, it could harm our reputation, financial condition, and operating results.

We require our suppliers and business partners to comply with laws and, where applicable, our company policies, such as the Google Supplier Code of Conduct, regarding workplace and employment practices, data security, environmental compliance, and intellectual property licensing, but we do not control them or their practices. Violations of law or unethical business practices could result in supply chain disruptions, canceled orders, harm to key relationships, and damage to our reputation. Their failure to procure necessary license rights to intellectual property could affect our ability to sell our products or services and expose us to litigation or financial claims.

Interruption to, interference with, or failure of our complex information technology and communications systems could hurt our ability to effectively provide our products and services, which could harm our reputation, financial condition, and operating results. In addition, problems with the design or implementation of our new global enterprise resource planning system could harm our business and operations.

The availability of our products and services and fulfillment of our customer contracts depend on the continuing operation of our information technology and communications systems. Our systems are vulnerable to damage, interference, or interruption from modifications or upgrades, terrorist attacks, natural disasters or pandemics, the effects of climate change (such as sea level rise, drought, flooding, heat waves, wildfires and resultant air quality effects and power shutoffs associated with wildfire prevention, and increased storm severity), power loss, telecommunications failures, computer viruses, ransomware attacks, computer denial of service attacks, phishing schemes, or other attempts to harm or access our systems. Some of our data centers are located in areas with a high risk of major earthquakes or other natural disasters. Our data centers are also subject to break-ins, sabotage, and intentional acts of vandalism, and, in some cases, to potential disruptions resulting from problems experienced by facility operators. Some of our systems are not fully redundant, and disaster recovery planning cannot account for all eventualities. The occurrence of a natural disaster or pandemic, closure of a facility, or other unanticipated problems affecting our data centers could result in lengthy interruptions in our service. In addition, our products and services are highly technical and complex and have contained in the past, and may contain in the future, errors or vulnerabilities, which could result in interruptions in or failure of our services or systems.

In addition, we rely extensively on information systems and technology to manage our business and summarize operating results. We are in the process of a multi-year implementation of a new ERP system, which is designed to accurately maintain our financial records, enhance the flow of financial information, improve data management, and provide timely information to our management team. As the phased implementation continues, we may experience delays, increased costs, and other difficulties. Failure to successfully design and implement the ERP system as planned could harm our business, financial condition, and operating results. Additionally, if we do not effectively implement the ERP system as planned or the ERP system does not operate as intended, the effectiveness of our internal control over financial reporting could be negatively affected.

Our international operations expose us to additional risks that could harm our business, our financial condition, and operating results.

Our international operations are significant to our revenues and net income, and we plan to continue to grow internationally. International revenues accounted for approximately 54% of our consolidated revenues in 2021. In addition to risks described elsewhere in this section, our international operations expose us to other risks, including the following:

- restrictions on foreign ownership and investments, and stringent foreign exchange controls that might prevent us from repatriating cash earned in countries outside the U.S.;
- import and export requirements, tariffs and other market access barriers that may prevent or impede us from offering products or providing services to a particular market, or that could limit our ability to source assemblies and finished products from a particular market, and may increase our operating costs;
- longer payment cycles in some countries, increased credit risk, and higher levels of payment fraud;
- an evolving foreign policy landscape that may adversely affect our revenues and could subject us to new regulatory costs and challenges (including the transfer of personal data between the EU and the United Kingdom and new customer requirements), in addition to other adverse effects that we are unable to effectively anticipate;
- anti-corruption laws, such as the U.S. Foreign Corrupt Practices Act, and other local laws prohibiting certain payments to government officials, violations of which could result in civil and criminal penalties;
- uncertainty regarding liability for services and content, including uncertainty as a result of local laws and lack of legal precedent; and
- different employee/employer relationships, existence of works councils and labor unions, and other challenges caused by distance, language, and cultural differences, making it harder to do business in certain jurisdictions.

Because we conduct business in currencies other than U.S. dollars but report our financial results in U.S. dollars, we have faced, and will continue to face, exposure to fluctuations in foreign currency exchange rates. Although we hedge a portion of our international currency exposure, significant fluctuations in exchange rates between the U.S. dollar and foreign currencies may adversely affect our revenues and earnings. Hedging programs are also inherently risky and could expose us to additional risks that could harm our financial condition and operating results.

Risks Related to our Industry

People access the Internet through a variety of platforms and devices that continue to evolve with the advancement of technology and user preferences. If manufacturers and users do not widely adopt versions of our products and services developed for these interfaces, our business could be harmed.

People access the Internet through a growing variety of devices such as desktop computers, mobile phones, smartphones, laptops and tablets, video game consoles, voice-activated speakers, wearables, automobiles, and television-streaming devices. Our products and services may be less popular on some interfaces. Each manufacturer or distributor may establish unique technical standards for its devices, and our products and services may not be available or may only be available with limited functionality for our users or our advertisers on these devices as a result. Some manufacturers may also elect not to include our products on their devices. In addition, search queries are increasingly being undertaken via voice-activated speakers, apps, social media or other platforms, which could harm our business. It is hard to predict the challenges we may encounter in adapting our products and services and developing competitive new products and services. We expect to continue to devote significant resources to creating and supporting products and services across multiple platforms and devices. Failing to attract and retain a substantial number of new device manufacturers, suppliers, distributors, developers, and users, or failing to develop products and technologies that work well on new devices and platforms, could harm our business, financial condition, and operating results and ability to capture future business opportunities.

Data privacy and security concerns relating to our technology and our practices could damage our reputation, cause us to incur significant liability, and deter current and potential users or customers from using our products and services. Software bugs or defects, security breaches, and attacks on our systems could result in the improper disclosure and use of user data and interference with our users' and customers' ability to use our products and services, harming our business operations and reputation.

Concerns about, including the adequacy of, our practices with regard to the collection, use, governance, disclosure, or security of personal information or other data-privacy-related matters, even if unfounded, could harm our reputation, financial condition, and operating results. Our policies and practices may change over time as expectations and regulations regarding privacy and data change.

Our products and services involve the storage, handling, and transmission of proprietary and other sensitive information. Software bugs, theft, misuse, defects, vulnerabilities in our products and services, and security breaches expose us to a risk of loss or improper use and disclosure of such information, which could result in litigation and other potential liability, including regulatory fines and penalties, as well as reputational harm. Additionally, our products incorporate highly technical and complex technologies, and thus our technologies and software have contained, and are likely in the future to contain, undetected errors, bugs, or vulnerabilities. We have in the past discovered, and may in the future discover, some errors in our software code only after we have released the code. Systems and control failures, security breaches, failure to comply with our privacy policies, and/or inadvertent disclosure of user data could result in government and legal exposure, seriously harm our reputation, brand, and business, and impair our ability to attract and retain users or customers. Such incidents have occurred in the past and may continue to occur due to the scale and nature of our products and services. While there is no guarantee that such incidents will not cause significant damage, we expect to continue to expend significant resources to maintain security protections that limit the effect of bugs, theft, misuse, and security vulnerabilities or breaches.

We experience cyber attacks and other attempts to gain unauthorized access to our systems on a regular basis. Cyber attacks continue to evolve in sophistication and volume, and inherently may be difficult to detect for long periods of time. We have seen, and will continue to see, industry-wide vulnerabilities, such as the Log4j vulnerability reported in December 2021, which could affect our or other parties' systems. We expect to continue to experience such incidents or vulnerabilities in the future. Our efforts to address undesirable activity on our platform may also increase the risk of retaliatory attack. We may experience future security issues, whether due to employee error or malfeasance or system errors or vulnerabilities in our or other parties' systems. While we may not determine some of these issues to be material at the time they occur and may remedy them quickly, there is no guarantee that these issues will not ultimately result in significant legal, financial, and reputational harm, including government inquiries and enforcement actions, litigation, and negative publicity. Because the techniques used to obtain unauthorized access to, disable or degrade service provided by or otherwise sabotage systems change frequently and often are recognized only after being launched against a target, even taking all reasonable precautions, including those required by law, we have been unable in the past and may continue to be unable to anticipate or detect attacks or vulnerabilities or implement adequate preventative measures.

Further, if any partners with whom we share user or other customer information fail to implement adequate data-security practices or fail to comply with our terms and policies or otherwise suffer a network or other security breach, our users' information may be improperly accessed, used, or disclosed. If an actual or perceived breach of our or our business partners' or service providers' security occurs, the market perception of the effectiveness of our security measures would be harmed, we could lose users and customers, our trade secrets or those of our business partners may be compromised, and we may be exposed to significant legal and financial

risks, including legal claims (which may include class-action litigation) and regulatory action, fines, and penalties. Any of the foregoing consequences could have a material and adverse effect on our business, reputation, and results of operations.

While we have dedicated significant resources to privacy and security incident response capabilities, including dedicated worldwide incident response teams, our response process, particularly during times of a natural disaster or pandemic, may not be adequate, may fail to accurately assess the severity of an incident, may not be fast enough to prevent or limit harm, or may fail to sufficiently remediate an incident. As a result, we may suffer significant legal, reputational, or financial exposure, which could harm our business, financial condition, and operating results.

For additional information, see also our risk factor on privacy and data protection regulations under 'Risks Related to Laws and Regulations' below.

Our ongoing investments in safety, security, and content review will likely continue to identify abuse of our platforms and misuse of user data.

In addition to our efforts to prevent and mitigate cyber attacks, we are making significant investments in safety, security, and review efforts to combat misuse of our services and unauthorized access to user data by third parties, including investigation and review of platform applications that could access the information of users of our services. As a result of these efforts, we have in the past discovered, and may in the future discover, incidents of unnecessary access to or misuse of user data or other undesirable activity by third parties. However, we may not have discovered, and may in the future not discover, all such incidents or activity, whether as a result of our data limitations, including our lack of visibility over our encrypted services, the scale of activity on our platform, or other factors, including factors outside of our control such as a natural disaster or pandemic, and we may learn of such incidents or activity via third parties. Such incidents and activities may include the use of user data or our systems in a manner inconsistent with our terms, contracts or policies, the existence of false or undesirable user accounts, election interference, improper ad purchases, activities that threaten people's safety on- or off-line, or instances of spamming, scraping, or spreading disinformation. While we may not determine some of these incidents to be material at the time they occurred and we may remedy them quickly, there is no guarantee that these issues will not ultimately result in significant legal, financial, and reputational harm, including government inquiries and enforcement actions, litigation, and negative publicity.

We may also be unsuccessful in our efforts to enforce our policies or otherwise prevent or remediate any such incidents. Any of the foregoing developments may negatively affect user trust and engagement, harm our reputation and brands, require us to change our business practices in ways that harm our business operations and adversely affect our business and financial results. Any such developments may also subject us to additional litigation and regulatory inquiries, which could result in monetary penalties and damages, divert management's time and attention, and lead to enhanced regulatory oversight.

Problematic content on our platforms, including low-quality user-generated content, web spam, content farms, and other violations of our guidelines could affect the quality of our services, which could damage our reputation and deter our current and potential users from using our products and services.

We, like others in the industry, face violations of our content guidelines across our platforms, including sophisticated attempts by bad actors to manipulate our hosting and advertising systems to fraudulently generate revenues, or to otherwise generate traffic that does not represent genuine user interest or intent. While we invest significantly in efforts to promote high-quality and relevant results and to detect and prevent low-quality content and invalid traffic, we have been unable and may continue to be unable to adequately detect and prevent all such abuses or promote uniformly high-quality content.

Many websites violate or attempt to violate our guidelines, including by seeking to inappropriately rank higher in search results than our search engine's assessment of their relevance and utility would rank them. Such efforts have affected, and may continue to affect, the quality of content on our platforms and lead them to display false, misleading, or undesirable content. Although English-language web spam in our search results has been reduced, and web spam in most other languages is limited, we expect web spammers will continue to seek inappropriate ways to improve their rankings. We continuously combat web spam in our search results, including through indexing technology that makes it harder for spam-like, less useful web content to rank highly. We also continue to invest in and deploy proprietary technology to detect and prevent web spam on our platforms. We also face other challenges from low-quality and irrelevant content websites, including content farms, which are websites that generate large quantities of low-quality content to help them improve their search rankings. We are continually launching algorithmic changes designed to detect and prevent abuse from low-quality websites. We also face other challenges on our platforms, including violations of our content guidelines involving incidents such as attempted election interference, activities that threaten the safety and/or well-being of our users on- or off-line, and the spreading of misinformation or disinformation.

If we fail to either detect and prevent an increase in problematic content or effectively promote high-quality content, it could hurt our reputation for delivering relevant information or reduce use of our platforms, harming our financial condition or operating results. It may also subject us to litigation and regulatory action, which could result in monetary penalties and damages and divert management's time and attention.

Our business depends on continued and unimpeded access to the Internet by us and our users. Internet access providers may be able to restrict, block, degrade, or charge for access to certain of our products and services, which could lead to additional expenses and the loss of users and advertisers.

Our products and services depend on the ability of our users to access the Internet, and certain of our products require significant bandwidth to work effectively. Currently, this access is provided by companies that have significant market power in the broadband and internet access marketplace, including incumbent telephone companies, cable companies, mobile communications companies, and government-owned service providers. Some of these providers have taken, or have stated that they may take measures that could degrade, disrupt, or increase the cost of user access to certain of our products by restricting or prohibiting the use of their infrastructure to support or facilitate our offerings, by charging increased fees to us or our users to provide our offerings, or by providing our competitors preferential access. Some jurisdictions have adopted regulations prohibiting certain forms of discrimination by internet access providers; however, substantial uncertainty exists in the U.S. and elsewhere regarding such protections. For example, in 2018 the U.S. Federal Communications Commission repealed net neutrality rules, which could permit internet access providers to restrict, block, degrade, or charge for access to certain of our products and services. In addition, in some jurisdictions, our products and services have been subject to government-initiated restrictions or blockages. These could harm existing key relationships, including with our users, customers, advertisers, and/or content providers, and impair our ability to attract new ones; damage our reputation; and increase costs, thereby negatively affecting our business.

Risks Related to Laws, Regulations, and Policies

We face increased regulatory scrutiny as well as changes in regulatory conditions, laws, and policies governing a wide range of topics that may negatively affect our business.

We and other companies in the technology industry face increased regulatory scrutiny, enforcement action, and other proceedings. For instance, the U.S. Department of Justice, joined by a number of state Attorneys General, filed an antitrust complaint against Google on October 20, 2020, alleging that Google violated U.S. antitrust laws relating to Search and Search advertising. Similarly, on December 16, 2020, a number of state Attorneys General filed an antitrust complaint against Google in the U.S. District Court for the Eastern District of Texas, alleging that Google violated U.S. antitrust laws as well as state deceptive trade laws relating to its advertising technology. Various other regulatory agencies in the U.S. and around the world, including competition enforcers, consumer protection agencies, data protection authorities, grand juries, inter-agency consultative groups, and a range of other governmental bodies have and continue to review and in some cases challenge our products and services and their compliance with laws and regulations around the world. We continue to cooperate with these investigations and defend litigation where appropriate. Various laws, regulations, investigations, enforcement lawsuits, and regulatory actions have in the past, and may in the future, result in substantial fines and penalties, injunctive relief, ongoing auditing and monitoring obligations, changes to our products and services, alterations to our business models and operations, and collateral litigation, all of which could harm our business, reputation, financial condition, and operating results.

Changes in international and local social, political, economic, tax, and regulatory conditions or in laws and policies have in the past, and may in the future, increase our cost of doing business and limit our ability to pursue certain business models, offer products or services in certain jurisdictions, or cause us to change our business practices. We have in the past had to alter or stop offering certain products and services as a result of laws or regulations that made them unfeasible, and new laws or regulations could result in our having to terminate, alter, or withdraw products and services in the future. Additional costs of doing business, new limitations, or changes to our business model or practices could harm our business, reputation, financial condition, and operating results.

We are subject to regulations, laws, and policies that govern a wide range of topics, including those related to matters beyond our core products and services. For instance, new regulations, laws, policies, and international accords relating to environmental and social matters, including sustainability, climate change, human capital, and diversity, are being developed and formalized in Europe, the U.S., and elsewhere, which may entail specific, target-driven frameworks and/or disclosure requirements. We have implemented robust environmental and social programs, adopted reporting frameworks and principles, and announced a number of goals and initiatives, including those related to environmental sustainability and diversity. The implementation of these goals and initiatives may require considerable investments, and our goals, with all of their contingencies, dependencies, and in certain cases, reliance on third-party verification and/or performance, are complex and ambitious, and we cannot guarantee that we will achieve them.

Additionally, there can be no assurance that our current programs, reporting frameworks, and principles will be in compliance with any new environmental and social laws and regulations that may be promulgated in the U.S. and elsewhere, and the costs of changing any of our current practices to comply with any new legal and regulatory requirements in the U.S. and elsewhere may be substantial. Furthermore, industry and market practices may further develop to become even more robust than what is required under any new laws and regulations, and we may have to expend significant efforts and resources to keep up with market trends and stay competitive among our peers.

A variety of new and existing laws and/or interpretations could harm our business.

We are subject to numerous U.S. and foreign laws and regulations covering a wide variety of subject matters. New laws and regulations, or new interpretations or applications of existing laws and regulations in a manner inconsistent with our practices, have made, and may continue to make, our products and services less useful, limit our ability to pursue certain business models or offer certain products and services in certain jurisdictions, require us to incur substantial costs, expose us to civil or criminal liability, or cause us to change our business practices. These laws and regulations are evolving and involve matters central to our business, including, among others:

- Laws and regulations around the world focused on large technology platforms, including the Digital Markets Act in the European Union and proposed antitrust legislation on self-preferencing and mergers and acquisitions in the U.S., which may limit certain business practices, and in some cases, create the risk of significant penalties.
- Privacy laws, such as the GDPR, CCPA, CPRA, Virginia CDPA, and ColoPA (as defined and discussed further below).
- Data protection laws passed by many states within the U.S. and by certain countries regarding notification to data subjects and/or regulators when there is a security breach of personal data.
- Consumer protection laws, including EU's New Deal for Consumers, which could result in monetary penalties and create a range of new compliance obligations.
- New laws further restricting the collection, processing and/or sharing of advertising-related data. Copyright or similar laws around the world, including the EU Directive on Copyright in the Digital Single Market (EUCD) and EU member state transpositions. These and similar laws that have been adopted or proposed introduce new licensing regimes that could affect our ability to operate. The EUCD and similar laws could also increase the liability of some content-sharing services with respect to content uploaded by their users. Some of these laws, as well as follow-on administrative or judicial actions, have also created or may create a new property right in news publications that limits the ability of some online services to link to, interact with, or present such content. They may also require individual or collective compensation negotiations with news agencies and publishers for the use of such content, which may result in payment obligations that significantly exceed the value that such content provides to Google and its users, potentially harming our services, commercial operations, and business results.
- Data localization laws, which generally mandate that certain types of data collected in a particular country be stored and/or processed within that country.
- Various U.S. and international laws that govern the distribution of certain materials to children and regulate the ability of online services to collect information from minors, including the Children's Online Privacy Protection Act of 1998 and the United Kingdom's Age-Appropriate Design Code.
- Various laws with regard to content moderation and removal, and related disclosure obligations, such as the Network Enforcement Act in Germany and the European Union's pending Digital Services Act, which may affect our businesses and operations and may subject us to significant fines if such laws are interpreted and applied in a manner inconsistent with our practices or when we may not proactively discover such content due to the scale of third-party content and the limitations of existing technologies. Other countries, including Singapore, Australia, and the United Kingdom, have implemented or are considering similar legislation imposing penalties for failure to remove certain types of content.
- Various legislative, litigation, and regulatory activity regarding our Google Play billing policies and business model, which could result in monetary penalties, damages and/or prohibition.
- Various legislative and regulatory activity requiring disclosure of information about the operation of our services and algorithms, which may make it easier for websites to artificially promote low-quality, deceptive, or harmful content on services like Google Search and YouTube, potentially harming the quality of our services.

In addition, the applicability and scope of these laws, as interpreted by the courts, remain uncertain and could harm our business. For example:

- We rely on statutory safe harbors, as set forth in the Digital Millennium Copyright Act and Section 230 of the Communications Decency Act in the U.S. and the E-Commerce Directive in Europe, against liability for various linking, caching, and hosting activities. Any legislation or court rulings affecting these safe harbors may adversely affect us. There are legislative proposals in both the U.S. and EU that could reduce our safe harbor protection.
- Court decisions such as the judgment of the Court of Justice of the European Union (CJEU) on May 13, 2014 on the 'right to be forgotten,' which allows individuals to demand that Google remove search results about them in certain instances, may limit the content we can show to our users and impose significant operational burdens.

The introduction of new businesses, products, services, and technologies, our activities in certain jurisdictions, or other actions we take have subjected us, and will likely continue to subject us, to additional laws and regulations. Our investment in a variety of new fields, such as healthcare and payment services, has expanded, and will continue to expand, the scope of regulations that apply to our business. The costs of compliance with these laws and regulations are high and are likely to increase in the future. Any failure on our part to comply with laws and regulations can result in negative publicity and diversion of management time and effort and may subject us to significant liabilities and other penalties.

We are subject to claims, suits, government investigations, other proceedings, and consent decrees that may harm our business, financial condition, and operating results.

We are subject to claims, suits, government investigations, other proceedings, and consent decrees involving competition, intellectual property, data privacy and security, consumer protection, tax, labor and employment, commercial disputes, content generated by our users, goods and services offered by advertisers or publishers using our platforms, and other matters. Due to our manufacturing and sale of an expanded suite of products and services, including hardware as well as Google Cloud offerings, we also are subject to a variety of claims including product warranty, product liability, and consumer protection claims related to product defects, among other litigation. We may also be subject to claims involving health and safety, hazardous materials usage, other environmental effects, or service disruptions or failures.

Any of these types of legal proceedings can have an adverse effect on us because of legal costs, diversion of management resources, negative publicity and other factors. Determining reserves for our pending litigation is a complex, fact-intensive process that requires significant judgment. The resolution of one or more such proceedings has resulted in, and may in the future result in, additional substantial fines, penalties, injunctions, and other sanctions that could harm our business, financial condition, and operating results.

We may be subject to legal liability associated with providing online services or content.

Our products and services let users exchange information, advertise products and services, conduct business, and engage in various online activities. We also place advertisements displayed on other companies' websites, and we offer third-party products, services, and/or content. The law relating to the liability of online service providers for others' activities on their services is still somewhat unsettled around the world. Claims have been brought against us, and we expect will continue to be brought against us, for defamation, negligence, breaches of contract, copyright and trademark infringement, unfair competition, unlawful activity, torts, fraud, or other legal theories based on the nature and content of information available on or via our services.

We may be subject to claims by virtue of our involvement in hosting, transmitting, marketing, branding, or providing access to content created by third parties. Defense of such actions could be costly and involve significant time and attention of our management and other resources, may result in monetary liabilities or penalties, and may require us to change our business in an adverse manner.

Privacy and data protection regulations are complex and rapidly evolving areas. Any failure or alleged failure to comply with these laws could harm our business, reputation, financial condition, and operating results.

Authorities around the world have adopted and are considering a number of legislative and regulatory proposals concerning data protection and limits on encryption of user data. Adverse legal rulings, legislation, or regulation have resulted in, and may continue to result in, fines and orders requiring that we change our data practices, which could have an adverse effect on our ability to provide services, harming our business operations. Complying with these evolving laws could result in substantial costs and harm the quality of our products and services, negatively affecting our business, and may be particularly challenging during certain times, such as a natural disaster or pandemic. Amongst others, we are and will be subject to the following laws and regulations:

- The General Data Protection Regulation (GDPR), which applies to all of our activities conducted from an establishment in the EU or related to products and services that we offer to EU users or customers, or the monitoring of their behavior in the EU. Ensuring compliance with the range of obligations created by the GDPR is an ongoing commitment that involves substantial costs. Despite our efforts, governmental authorities or others have asserted and may continue to assert that our business practices fail to comply with its requirements. If our operations are found to violate the GDPR requirements, we may incur substantial fines, have to change our business practices, and face reputational harm, any of which could have an adverse effect on our business. Serious breaches of the GDPR can result in administrative fines of up to 4% of annual worldwide revenues. Fines of up to 2% of annual worldwide revenues can be levied for other specified violations.
- Various state privacy laws, such as the California Consumer Privacy Act of 2018 (CCPA), which came into effect in January of 2020; the California Privacy Rights Act (CPRA), which will go into effect in 2023; the Virginia Consumer Data Protection Act (Virginia CDPA), which will go into effect in 2023; and the Colorado Privacy Act (ColoPA), which will go into effect in 2023; all of which give new data privacy rights to their respective residents (including, in California, a private right of action in the event of a data breach resulting from our failure to implement and maintain reasonable security procedures and practices) and impose significant obligations on controllers and processors of consumer data.
- SB-327 in California, which regulates the security of data in connection with internet connected devices.

Further, we are subject to evolving laws and regulations that dictate whether, how, and under what circumstances we can transfer, process and/or receive personal data. The EU-U.S. and the Swiss-U.S. Privacy Shield frameworks that previously allowed U.S. companies that self-certify to the U.S. Department of Commerce and publicly commit to comply with specified requirements to import personal data from the EU and Switzerland have been invalidated by the CJEU. The CJEU upheld Standard Contractual Clauses (SCCs) as a valid transfer mechanism, provided they meet certain requirements. On June 4, 2021, the European Commission published new SCCs for this purpose, and we may have to adapt our existing contractual arrangements to meet these new requirements. The validity of data transfer mechanisms remains subject to legal, regulatory, and political developments in both Europe and the U.S., such as recent recommendations from the European Data Protection Board, decisions from supervisory authorities, recent proposals for reform of the data transfer mechanisms for transfers of personal data outside the United Kingdom, and potential invalidation of other data transfer mechanisms, which, together with increased enforcement action from supervisory authorities in relation to cross-border transfers of personal data, could have a significant adverse effect on our ability to process and transfer personal data outside of the European Economic Area and/or the United Kingdom.

These laws and regulations are evolving and subject to interpretation, including developments which create some uncertainty, and compliance obligations could cause us to incur costs or harm the operations of our products and services in ways that harm our business. For example, in the EU, several supervisory authorities have issued new guidance concerning the ePrivacy Directive's requirements regarding the use of cookies and similar technologies, including limitations on the use of data across messaging products and specific requirements for enabling users to accept or reject cookies, and have in some cases brought (and may seek to bring in the future) enforcement action in relation to those requirements. In the U.S., certain types of cookies may be deemed sales of personal information within the CCPA and other state laws, such that certain disclosure requirements and limitations apply to the use of such cookies. In addition, some countries are considering or have passed legislation implementing data protection requirements or requiring local storage and processing of data that could increase the cost and complexity of delivering our services and carries the potential of service interruptions in those countries.

We face, and may continue to face, intellectual property and other claims that could be costly to defend, result in significant damage awards or other costs (including indemnification awards), and limit our ability to use certain technologies in the future.

We, like other internet, technology and media companies, are frequently subject to litigation based on allegations of infringement or other violations of intellectual property rights. In addition, patent-holding companies may frequently seek to generate income from patents they have obtained by bringing claims against us. As we have grown, the number of intellectual property claims against us has increased and may continue to increase as we develop new products, services, and technologies.

We have had patent, copyright, trade secret, and trademark infringement lawsuits filed against us claiming that certain of our products, services, and technologies infringe the intellectual property rights of others. Other parties have also sought broad injunctive relief against us by filing claims in U.S. and international courts and the U.S. International Trade Commission (ITC) for exclusion and cease-and-desist orders, which could limit our ability to sell our products or services in the U.S. or elsewhere if our products or services or those of our customers or suppliers are found to infringe the intellectual property subject to the claims. Adverse results in any of these lawsuits may include awards of monetary damages, costly royalty or licensing agreements (if licenses are available at all), or orders preventing us from offering certain features, functionalities, products, or services. They may also cause us to change our business practices and require development of non-infringing products, services, or technologies, which could result in a loss of revenues for us and otherwise harm our business.

Many of our agreements with our customers and partners, including certain suppliers, require us to defend against certain intellectual property infringement claims and in some cases indemnify them for certain intellectual property infringement claims against them, which could result in increased costs for defending such claims or significant damages if there were an adverse ruling in any such claims. Such customers and partners may also discontinue the use of our products, services, and technologies, as a result of injunctions or otherwise, which could result in loss of revenues and adversely affect our business. Moreover, intellectual property indemnities provided to us by our suppliers, when obtainable, may not cover all damages and losses suffered by us and our customers arising from intellectual property infringement claims. Furthermore, in connection with our divestitures, we have agreed, and may in the future agree, to provide indemnification for certain potential liabilities, including those associated with intellectual property claims. Regardless of their merits, intellectual property claims are often time consuming and expensive to litigate or settle. To the extent such claims are successful, they may harm our business, including our product and service offerings, financial condition, or operating results.

Risks Related to Ownership of our Stock

We cannot guarantee that any share repurchase program will be fully consummated or will enhance long-term stockholder value, and share repurchases could increase the volatility of our stock prices and could diminish our cash reserves.

We engage in share repurchases of our Class A and Class C stock from time to time in accordance with authorizations from the Board of Directors of Alphabet. Our repurchase program does not have an expiration date and does not obligate Alphabet to repurchase any specific dollar amount or to acquire any specific number of shares. Further, our share repurchases could affect our share trading prices, increase their volatility, reduce our cash reserves and may be suspended or terminated at any time, which may result in a decrease in the trading prices of our stock.

The concentration of our stock ownership limits our stockholders' ability to influence corporate matters.

Our Class B stock has 10 votes per share, our Class A stock has one vote per share, and our Class C stock has no voting rights. As of December 31, 2021, Larry Page and Sergey Brin beneficially owned approximately 85.9% of our outstanding Class B stock, which represented approximately 51.4% of the voting power of our outstanding common stock. Through their stock ownership, Larry and Sergey have significant influence over all matters requiring stockholder approval, including the election of directors and significant corporate transactions, such as a merger or other sale of our company or our assets, for the foreseeable future. In addition, because our Class C stock carries no voting rights (except as required by applicable law), the issuance of the Class C stock, including in future stock-based acquisition transactions and to fund employee equity incentive programs, could continue Larry and Sergey's current relative voting power and their ability to elect all of our directors and to determine the outcome of most matters submitted to a vote of our stockholders. The share repurchases made pursuant to our repurchase program may also affect Larry and Sergey's relative voting power. This concentrated control limits or severely restricts other stockholders' ability to influence corporate matters and we may take actions that some of our stockholders do not view as beneficial, which could reduce the market price of our Class A stock and our Class C stock.

Provisions in our charter documents and under Delaware law could discourage a takeover that stockholders may consider favorable.

Provisions in Alphabet's certificate of incorporation and bylaws may have the effect of delaying or preventing a change of control or changes in our management. These provisions include the following:

- Our certificate of incorporation provides for a tri-class capital stock structure. As a result of this structure, Larry and Sergey have significant influence over all matters requiring stockholder approval. This concentrated control could discourage others from initiating any potential merger, takeover, or other change of control transaction that other stockholders may view as beneficial.
- Our Board of Directors has the right to elect directors to fill a vacancy created by the expansion of the Board of Directors or the resignation, death, or removal of a director.
- Our stockholders may not act by written consent, which makes it difficult to take certain actions without holding a stockholders' meeting.
- Our certificate of incorporation prohibits cumulative voting in the election of directors. This limits the ability of minority stockholders to elect director candidates.
- Stockholders must provide advance notice to nominate individuals for election to the Board of Directors or to propose matters that can be acted upon at a stockholders' meeting. These provisions may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of our company.
- Our Board of Directors may issue, without stockholder approval, shares of undesignated preferred stock, which makes it possible for our Board of Directors to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to acquire us.

As a Delaware corporation, we are also subject to certain Delaware anti-takeover provisions. Under Delaware law, a corporation may not engage in a business combination with any holder of 15% or more of its outstanding voting stock unless the holder has held the stock for three years or, among other things, the Board of Directors has approved the transaction. Our Board of Directors could rely on Delaware law to prevent or delay an acquisition of us.

General Risks

The continuing effects of COVID-19 are highly unpredictable and could be significant, and may have an adverse effect on our business, operations and our future financial performance.

Since COVID-19 was declared a global pandemic by the World Health Organization, our business, operations and financial performance have been, and may continue to be, affected by the macroeconomic impacts resulting from the efforts to control the spread of COVID-19. As a result of the scale of the ongoing pandemic, including the introduction of new variants of COVID-19 and vaccination and other efforts to control the spread, our revenue growth rate and expenses as a percentage of our revenues in future periods may differ significantly from our historical rates, and our future operating results may fall below expectations. Additionally, we may experience a significant and prolonged shift in user behavior such as a shift in interests to less commercial topics.

As a result of the pandemic, our workforce shifted to operating in a primarily remote working environment, which continues to create inherent productivity, connectivity, and oversight challenges. The effects of the ongoing pandemic are dynamic and uneven. As we prepare to return our workforce in more locations back to the office, we may experience increased costs and/or disruption as we experiment with hybrid work models, in addition to potential effects on our ability to operate effectively and maintain our corporate culture.

Our operating results may fluctuate, which makes our results difficult to predict and could cause our results to fall short of expectations.

Our operating results have fluctuated, and may in the future fluctuate, as a result of a number of factors, many outside of our control, including the cyclicity and seasonality in our business and geopolitical events. As a result, comparing our operating results (including our expenses as a percentage of our revenues) on a period-to-period basis may not be meaningful, and our past results should not be relied on as an indication of our future performance. Consequently, our operating results in future quarters may fall below expectations.

Acquisitions, joint ventures, investments, and divestitures could result in operating difficulties, dilution, and other consequences that may harm our business, financial condition, and operating results.

Acquisitions, joint ventures, investments and divestitures are important elements of our overall corporate strategy and use of capital, and these transactions could be material to our financial condition and operating results. We expect to continue to evaluate and enter into discussions regarding a wide array of such potential strategic transactions, which could create unforeseen operating difficulties and expenditures. Some of the areas where we face risks include:

- diversion of management time and focus from operating our business to challenges related to acquisitions and other strategic transactions;
- failure to obtain required approvals on a timely basis, if at all, from governmental authorities, or conditions placed upon approval that could, among other things, delay or prevent us from completing a transaction, or otherwise restrict our ability to realize the expected financial or strategic goals of a transaction;
- failure to successfully integrate and further develop the acquired business or technology;
- implementation or remediation of controls, procedures, and policies at the acquired company;
- integration of the acquired company's accounting, human resource (including cultural integration and retention of employees), and other administrative systems, and coordination of product, engineering, and sales and marketing functions;
- transition of operations, users, and customers onto our existing platforms;
- in the case of foreign acquisitions, the need to integrate operations across different cultures and languages and to address the particular economic, currency, political, and regulatory risks associated with specific countries;
- liability for activities of the acquired company before the acquisition, including patent and trademark infringement claims, data privacy and security issues, violations of laws, commercial disputes, tax liabilities, warranty claims, product liabilities, and other known and unknown liabilities; and
- litigation or other claims in connection with the acquired company, including claims from terminated employees, customers, former stockholders, or other third parties.

Our failure to address these risks or other problems encountered in connection with our past or future acquisitions and other strategic transactions could cause us to fail to realize their anticipated benefits, incur unanticipated liabilities, and harm our business generally.

Our acquisitions and other strategic transactions could also result in dilutive issuances of our equity securities, the incurrence of debt, contingent liabilities, or amortization expenses, or impairment of goodwill and/or purchased long-lived assets, and restructuring charges, any of which could harm our financial condition or operating results. Also, the anticipated benefits or value of our acquisitions and other strategic transactions may not materialize. In connection with our divestitures, we have agreed, and may in the future agree, to provide indemnification for certain potential liabilities, which may harm our financial condition or operating results.

If we were to lose the services of key personnel, we may not be able to execute our business strategy.

Our future success depends in large part upon the continued service of key members of our senior management team. For instance, Sundar Pichai is critical to the overall management of Alphabet and its subsidiaries and plays an important role in the development of our technology, maintaining our culture, and setting our strategic direction. All of our executive officers and key employees are at-will employees, and we do not maintain any key-person life insurance policies. The loss of key personnel could seriously harm our business.

We rely on highly skilled personnel and, if we are unable to retain or motivate key personnel, hire qualified personnel, or maintain our corporate culture, we may not be able to grow effectively.

Our performance largely depends on the talents and efforts of highly skilled individuals. Our ability to compete effectively and our future success depends on our continuing to identify, hire, develop, motivate, and retain highly skilled personnel for all areas of our organization. Competition in our industry for qualified employees is intense, and certain of our competitors have directly targeted our employees. In addition, our compensation arrangements, such as our equity award programs, may not always be successful in attracting new employees and retaining and motivating our existing employees. Restrictive immigration policy and regulatory changes may also affect our ability to hire, mobilize, or retain some of our global talent.

In addition, we believe that our corporate culture fosters innovation, creativity, and teamwork. As our organization grows and evolves, we may need to implement more complex organizational management structures or adapt our corporate culture and work environments to ever-changing circumstances, such as during times of a natural disaster or pandemic, and these changes could affect our ability to compete effectively or have an adverse effect on our corporate culture.

We are exposed to fluctuations in the fair values of our investments and, in some instances, our financial statements incorporate valuation methodologies that are subjective in nature resulting in fluctuations over time.

The fair value of our investments may in the future be, and certain investments have been in the past, negatively affected by liquidity, credit deterioration or losses, performance and financial results of the underlying entities, foreign exchange rates, changes in interest rates, including changes that may result from the implementation of new benchmark rates, the effect of new or changing regulations, the stock market in general, or other factors.

We measure certain of our non-marketable equity and debt securities, certain other instruments including stock-based compensation awards settled in the stock of certain Other Bets, and certain assets and liabilities acquired in a business combination, at fair value on a nonrecurring basis. The determination of fair value involves use of appropriate valuation methods and certain unobservable inputs, requires management judgment and estimation, and may change over time. We adjust the carrying value of our non-marketable equity securities to fair value for observable transactions of identical or similar investments of the same issuer or for impairments. All gains and losses on non-marketable equity securities, are recognized in other income (expense), which increases the volatility of our other income (expense). The unrealized gains and losses we record from fair value remeasurements of our non-marketable equity securities in any particular period may differ significantly from the gains or losses we ultimately experience on such investments.

As a result of these factors, the value or liquidity of our cash equivalents, as well as our marketable and non-marketable securities could decline and result in a material impairment, which could adversely affect our financial condition and operating results.

We could be subject to changes in tax rates, the adoption of new U.S. or international tax legislation, or exposure to additional tax liabilities.

Our future income taxes could be negatively affected by earnings being lower than anticipated in jurisdictions that have lower statutory tax rates and higher than anticipated in jurisdictions that have higher statutory tax rates, the net gains and losses recognized by legal entities on certain hedges and related hedged intercompany and other transactions under our foreign exchange risk management program, decreases in our stock price for shares paid as employee compensation, changes in the valuation of our deferred tax assets or liabilities, the application of different provisions of tax laws or changes in tax laws, regulations, or accounting principles (including changes in the interpretation of existing laws), as well as certain discrete items.

In addition, we are subject to regular review and audit by both domestic and foreign tax authorities. As a result, we have received, and may in the future receive, assessments in multiple jurisdictions, including in Europe, on various tax-related assertions, such as transfer-pricing adjustments or permanent-establishment claims. Any adverse outcome of such a review or audit could have a negative effect on our operating results and financial condition and could require us to change our business practices in a manner adverse to our business. It may also subject us to additional litigation and regulatory inquiries, resulting in the diversion of management's time and attention. In addition, the determination of our worldwide provision for income taxes and other tax liabilities requires significant judgment, and there are many transactions and calculations for which the ultimate tax determination is uncertain. Although we believe our estimates are reasonable, the ultimate tax outcome may differ from the amounts recorded in our financial statements and may affect our financial results in the period or periods for which such determination is made.

Furthermore, due to shifting economic and political conditions, tax policies, laws, or rates in various jurisdictions may be subject to significant changes in ways that impair our financial results. Various jurisdictions around the world have enacted or are considering digital services taxes, which could lead to inconsistent and potentially overlapping international tax regimes. The Organization for Economic Cooperation and Development (OECD) continues to advance proposals relating to its initiative for modernizing international tax rules, with the goal of having different countries implement a modernized and aligned international tax framework, but there can be no guarantee that this will occur.

In addition, in response to significant market volatility and disruptions to business operations resulting from the global spread of COVID-19, legislatures and taxing authorities in many jurisdictions in which we operate may propose changes to their tax rules. These changes could include modifications that have temporary effect, and more permanent changes. The effect of these potential new rules on us, our long-term tax planning, and our effective tax rate could be material.

The trading price for our Class A stock and non-voting Class C stock may continue to be volatile.

The trading price of our stock has at times experienced substantial price volatility and may continue to be volatile. In addition to the factors discussed in this report, the trading price of our Class A stock and Class C stock have fluctuated, and may continue to fluctuate widely, in response to various factors, many of which are beyond our control, including, among others, the activities of our peers and changes in broader economic and political conditions around the world. These broad market and industry factors may harm the market price of our Class A stock and our Class C stock, regardless of our actual operating performance.

— ITEM 1B. UNRESOLVED STAFF COMMENTS

Not applicable.

— ITEM 2. PROPERTIES

Our headquarters are located in Mountain View, California. We also own and lease office and building space in the surrounding areas near our headquarters. In addition, we own and lease office/building space and R&D sites around the world, primarily in North America, Europe, South America, and Asia. We own and operate data centers in the U.S., Europe, South America, and Asia. We believe our existing facilities, both owned and leased, are in good condition and suitable for the conduct of our business.

— ITEM 3. LEGAL PROCEEDINGS

For a description of our material pending legal proceedings, see Legal Matters in Note 10 of the Notes to Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K, which is incorporated herein by reference.

— ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

— ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

As of October 2, 2015, Alphabet Inc. became the successor issuer of Google Inc. pursuant to Rule 12g-3(a) under the Exchange Act. Our Class A common stock has been listed on the Nasdaq Global Select Market under the symbol "GOOG" since August 19, 2004 and under the symbol "GOOGL" since April 3, 2014. Prior to August 19, 2004, there was no public market for our stock. Our Class B common stock is neither listed nor traded. Our Class C capital stock has been listed on the Nasdaq Global Select Market under the symbol "GOOG" since April 3, 2014.

Holders of Record

As of December 31, 2021, there were approximately 4,907 and 1,733 stockholders of record of our Class A common stock and Class C capital stock, respectively. Because many of our shares of Class A common stock and Class C capital stock are held by brokers and other institutions on behalf of stockholders, we are unable to estimate the total number of stockholders represented by these record holders. As of December 31, 2021, there were approximately 64 stockholders of record of our Class B common stock.

Dividend Policy

We have never declared or paid any cash dividend on our common or capital stock. The primary use of capital continues to be to invest for the long-term growth of the business. We regularly evaluate our cash and capital structure, including the size, pace, and form of capital return to stockholders.

Issuer Purchases of Equity Securities

The following table presents information with respect to Alphabet's repurchases of Class A common stock and Class C capital stock during the quarter ended December 31, 2021:

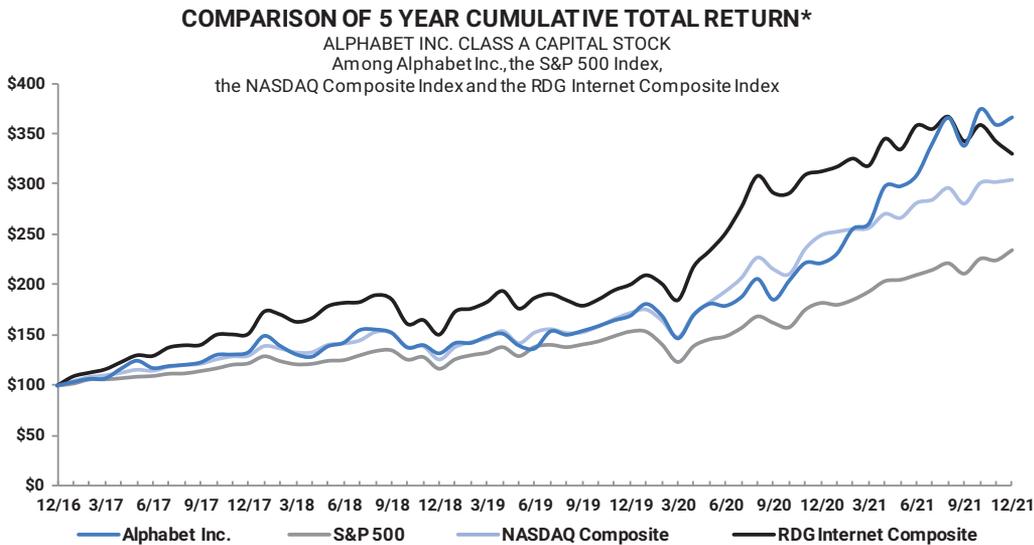
Period	Total Number of Class A Shares Purchased (in thousands) ⁽¹⁾	Total Number of Class C Shares Purchased (in thousands) ⁽¹⁾	Average Price Paid per Class A Share ⁽²⁾	Average Price Paid per Class C Share ⁽²⁾	Total Number of Shares Purchased as Part of Publicly Announced Programs (in thousands) ⁽¹⁾	Approximate Dollar Value of Shares that May Yet Be Purchased Under the Program (in millions)
October 1 - 31	126	1,445	\$ 2,812.76	\$ 2,794.72	1,571	\$ 26,450
November 1 - 30	289	1,393	\$ 2,943.97	\$ 2,956.73	1,682	\$ 21,479
December 1 - 31	250	1,169	\$ 2,880.79	\$ 2,898.56	1,419	\$ 17,371
Total	665	4,007			4,672	

(1) The repurchases are being executed from time to time, subject to general business and market conditions and other investment opportunities, through open market purchases or privately negotiated transactions, including through Rule 10b5-1 plans. The repurchase program does not have an expiration date. See Note 11 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for additional information related to share repurchases.

(2) Average price paid per share includes costs associated with the repurchases.

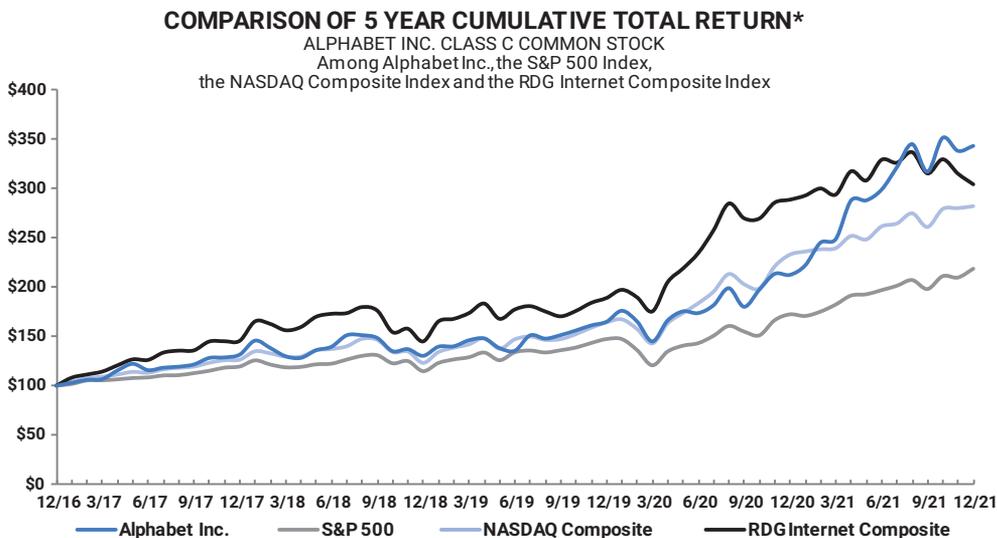
Stock Performance Graphs

The graph below matches Alphabet Inc. Class A's cumulative 5-year total stockholder return on common stock with the cumulative total returns of the S&P 500 index, the NASDAQ Composite index, and the RDG Internet Composite index. The graph tracks the performance of a \$100 investment in our common stock and in each index (with the reinvestment of all dividends) from December 31, 2016 to December 31, 2021. The returns shown are based on historical results and are not intended to suggest future performance.



*\$100 invested on December 31, 2016 in stock or index, including reinvestment of dividends. Fiscal year ending December 31. Copyright© 2022 S&P, a division of The McGraw-Hill Companies Inc. All rights reserved.

The graph below matches Alphabet Inc. Class C's cumulative 5-year total stockholder return on capital stock with the cumulative total returns of the S&P 500 index, the NASDAQ Composite index, and the RDG Internet Composite index. The graph tracks the performance of a \$100 investment in our Class C capital stock and in each index (with the reinvestment of all dividends) from December 31, 2016 to December 31, 2021. The returns shown are based on historical results and are not intended to suggest future performance.



*\$100 invested on December 31, 2016 in stock or in index, including reinvestment of dividends. Fiscal year ending December 31. Copyright© 2022 S&P, a division of The McGraw-Hill Companies Inc. All rights reserved.

— **ITEM 6. [RESERVED]**

— ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Please read the following discussion and analysis of our financial condition and results of operations together with "Note about Forward-Looking Statements," Part I, Item 1 "Business," Part I, Item 1A "Risk Factors," and our consolidated financial statements and related notes included under Item 8 of this Annual Report on Form 10-K.

We have omitted discussion of 2019 results where it would be redundant to the discussion previously included in Item 7 of our 2020 Annual Report on Form 10-K.

Understanding Alphabet's Financial Results

Alphabet is a collection of businesses — the largest of which is Google. We report Google in two segments, Google Services and Google Cloud; we also report all non-Google businesses collectively as Other Bets. Other Bets include earlier stage technologies that are further afield from our core Google business. For further details on our segments, see Part I, Item 1 "Business" and Note 15 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K.

Trends in Our Business and Financial Effect

The following long-term trends have contributed to the results of our consolidated operations, and we anticipate that they will continue to affect our future results:

- **Users' behaviors and advertising continue to shift online as the digital economy evolves.**

The continuing shift from an offline to online world has contributed to the growth of our business since inception, contributing to revenue growth, and we expect that this online shift will continue to benefit our business.

- **Users are increasingly using diverse devices and modalities to access our products and services, and our advertising revenues are increasingly coming from new formats.**

Our users are accessing the Internet via diverse devices and modalities, such as smartphones, wearables and smart home devices, and want to be able to be connected no matter where they are or what they are doing. We are focused on expanding our products and services to stay in front of these trends in order to maintain and grow our business.

We are increasingly generating advertising revenues from different channels, including mobile, and newer advertising formats. The margins on advertising revenues from these channels and newer products have generally been lower than those from traditional desktop search. Additionally, as the market for a particular device type or modality matures, our revenues may be affected. For example, growth in the global smartphone market has slowed due to various factors, including increased market saturation in developed countries, which can affect our mobile advertising revenue growth rates.

We expect TAC paid to our distribution partners and Google Network partners to increase as our revenues grow and TAC as a percentage of our advertising revenues ("TAC rate") to be affected by changes in device mix; geographic mix; partner mix; partner agreement terms; the percentage of queries channeled through paid access points; product mix; the relative revenue growth rates of advertising revenues from different channels; and revenue share terms.

We expect these trends to continue to affect our revenue growth rates and put pressure on our margins.

- **As online advertising evolves, we continue to expand our product offerings, which may affect our monetization.**

As interactions between users and advertisers change, and as online user behavior evolves, we continue to expand and evolve our product offerings to serve these changing needs. Over time, we expect our monetization trends to fluctuate. For example, we have seen an increase in revenues from ads on YouTube and Google Play, which monetize at a lower rate than our traditional search ads.

- **As users in developing economies increasingly come online, our revenues from international markets continue to increase and movements in foreign exchange rates affect such revenues.**

The shift to online, as well as the advent of the multi-device world, has brought opportunities outside of the U.S., including in emerging markets, such as India. We continue to invest heavily and develop localized versions of our products and advertising programs relevant to our users in these markets. This has led to a trend of increased revenues from emerging markets. We expect that our results will continue to be affected by our performance in these markets, particularly as low-cost mobile devices become more available. This trend could affect our revenues as developing markets initially monetize at a lower rate than more mature markets.

International revenues represent a significant portion of our revenues and are subject to fluctuations in foreign currency exchange rates relative to the U.S. dollar. While we have a foreign exchange risk management program designed to reduce our exposure to these fluctuations, this program does not fully offset their effect on our revenues and earnings.

- **The portion of revenues that we derive from non-advertising revenues is increasing and may adversely affect margins.**

Non-advertising revenues have grown over time. We expect this trend to continue as we focus on expanding our offerings through products and services like Google Cloud, Google Play, hardware products, and YouTube subscriptions. We currently derive non-advertising revenues primarily from sales of apps and in-app purchases, digital content products, and hardware; and licensing and service fees, including fees received for Google Cloud services and subscription and other services. A number of Other Bets initiatives are in their initial development stages, and as such, revenues from these businesses could be volatile. In addition, the margins on these revenues vary significantly and may be lower than the margins on our advertising revenues.

- **As we continue to serve our users and expand our businesses, we will invest heavily in operating and capital expenditures.**

We continue to make significant R&D investments in areas of strategic focus across Google Services, Google Cloud and Other Bets. We also expect to continue to invest in land and buildings for data centers and offices, and information technology assets, which includes servers and network equipment, to support the long-term growth of our business. In addition, acquisitions and strategic investments contribute to the breadth and depth of our offerings, expand our expertise in engineering and other functional areas, and build strong partnerships around strategic initiatives. For example, in January 2021 we closed the acquisition of Fitbit, Inc. for \$2.1 billion, which is expected to help spur innovation in wearable devices.

- **We face continuing changes in regulatory conditions, laws, and public policies, which could affect our business practices and financial results.**

Changes in social, political, economic, tax, and regulatory conditions or in laws and policies governing a wide range of topics and related legal matters have resulted in fines and caused us to change our business practices. As these global trends continue, our cost of doing business may increase, and our ability to pursue certain business models or offer certain products or services may be limited. Examples include the antitrust complaints filed by the U.S. Department of Justice and a number of state Attorneys General, the Digital Markets Act in Europe, and various legislative proposals in the U.S. focused on large technology platforms.

- **Our employees are critical to our success and we expect to continue investing in them.**

Our employees are among our best assets and are critical for our continued success. We expect to continue hiring talented employees around the globe and to provide competitive compensation programs. For additional information see Culture and Workforce in Part I, Item 1 "Business."

Seasonality and other

Our advertising revenues are affected by seasonal fluctuations in internet usage, advertising expenditures, and underlying business trends, such as traditional retail seasonality. Additionally, our non-advertising revenues, including those generated from Google Cloud, Google Play, hardware, and YouTube, may be affected by fluctuations driven by changes in pricing, digital content releases, fee structures, new product and service launches, other market dynamics, as well as seasonality.

Revenues and Monetization Metrics

GOOGLE SERVICES

Google Services revenues consist of revenues generated from advertising ("Google advertising") as well as revenues from other sources ("Google other revenues").

Google Advertising

Google advertising revenues are comprised of the following:

- Google Search & other, which includes revenues generated on Google search properties (including revenues from traffic generated by search distribution partners who use Google.com as their default search in browsers, toolbars, etc.), and other Google owned and operated properties like Gmail, Google Maps, and Google Play;
- YouTube ads, which includes revenues generated on YouTube properties; and
- Google Network, which includes revenues generated on Google Network properties participating in AdMob, AdSense, and Google Ad Manager.

We use certain metrics to track how well traffic across various properties is monetized as it relates to our advertising revenues: paid clicks and cost-per-click pertain to traffic on Google Search & other properties, while impressions and cost-per-impressions pertain to traffic on our Network partners' properties.

Paid clicks represent engagement by users and include clicks on advertisements by end-users on Google search properties and other Google owned and operated properties including Gmail, Google Maps, and Google Play. Cost-per-click is defined as click-driven revenues divided by our total number of paid clicks and represents the average amount we charge advertisers for each engagement by users.

Impressions include impressions displayed to users on Google Network properties participating primarily in AdMob, AdSense, and Google Ad Manager. Cost-per-impression is defined as impression-based and click-based revenues divided by our total number of impressions, and represents the average amount we charge advertisers for each impression displayed to users.

As our business evolves, we periodically review, refine, and update our methodologies for monitoring, gathering, and counting the number of paid clicks and the number of impressions, and for identifying the revenues generated by the corresponding click and impression activity.

Our advertising revenue growth, as well as the change in paid clicks and cost-per-click on Google Search & other properties and the change in impressions and cost-per-impression on Google Network properties and the correlation between these items, have been affected and may continue to be affected by various factors, including:

- advertiser competition for keywords;
- changes in advertising quality, formats, delivery or policy;
- changes in device mix;
- changes in foreign currency exchange rates;
- fees advertisers are willing to pay based on how they manage their advertising costs;
- general economic conditions, including the effect of COVID-19;
- seasonality; and
- traffic growth in emerging markets compared to more mature markets and across various advertising verticals and channels.

Google Other

Google other revenues are comprised of the following:

- Google Play, which includes sales of apps and in-app purchases and digital content sold in the Google Play store;
- Devices and Services, which includes sales of hardware, including Fitbit wearable devices, Google Nest home products, and Pixel phones;
- YouTube non-advertising, which includes YouTube Premium and YouTube TV subscriptions; and
- other products and services.

GOOGLE CLOUD

Google Cloud revenues are comprised of the following:

- Google Cloud Platform, which includes fees for infrastructure, platform, and other services;
- Google Workspace, which includes fees for cloud-based collaboration tools for enterprises, such as Gmail, Docs, Drive, Calendar and Meet; and
- other enterprise services.

OTHER BETS

Revenues from Other Bets are generated primarily from the sale of health technology and internet services.

For further details on how we recognize revenue, see Note 1 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K.

Costs and Expenses

Our cost structure has two components: cost of revenues and operating expenses. Our operating expenses include costs related to R&D, sales and marketing, and general and administrative functions. Certain of these expenses, including those associated with the operation of our technical infrastructure as well as components of our operating expenses, are generally less variable in nature and may not correlate to the changes in revenue.

COST OF REVENUES

Cost of revenues is comprised of TAC and other costs of revenues.

- TAC includes:
 - Amounts paid to our distribution partners who make available our search access points and services. Our distribution partners include browser providers, mobile carriers, original equipment manufacturers, and software developers.
 - Amounts paid to Google Network partners primarily for ads displayed on their properties.
- Other cost of revenues includes:
 - Content acquisition costs, which are payments to content providers from whom we license video and other content for distribution on YouTube and Google Play (we pay fees to these content providers based on revenues generated or a flat fee).
 - Expenses associated with our data centers (including bandwidth, compensation expenses, depreciation, energy, and other equipment costs) as well as other operations costs (such as content review as well as customer and product support costs).
 - Inventory and other costs related to the hardware we sell.

The cost of revenues as a percentage of revenues generated from ads placed on Google Network properties are significantly higher than the cost of revenues as a percentage of revenues generated from ads placed on Google Search & other properties, because most of the advertiser revenues from ads served on Google Network properties are paid as TAC to our Google Network partners.

OPERATING EXPENSES

Operating expenses are generally incurred during our normal course of business, which we categorize as either R&D, sales and marketing, or general and administrative.

The main components of our R&D expenses are:

- compensation expenses for engineering and technical employees responsible for R&D related to our existing and new products and services;
- depreciation; and
- professional services fees primarily related to consulting and outsourcing services.

The main components of our sales and marketing expenses are:

- compensation expenses for employees engaged in sales and marketing, sales support, and certain customer service functions; and
- spending relating to our advertising and promotional activities in support of our products and services.

The main components of our general and administrative expenses are:

- compensation expenses for employees in finance, human resources, information technology, legal, and other administrative support functions;
- expenses related to legal matters, including fines and settlements; and
- professional services fees, including audit, consulting, outside legal, and outsourcing services.

Other Income (Expense), Net

Other income (expense), net primarily consists of interest income (expense), the effect of foreign currency exchange gains (losses), net gains (losses) and impairment on our marketable and non-marketable securities, performance fees, and income (loss) and impairment from our equity method investments.

For additional details, including how we account for our investments and factors that can drive fluctuations in the value of our investments, see Note 1 and Note 3 of the Notes to Consolidated Financial Statements included in Part II, Item 8 of this Annual Report on Form 10-K as well as Item 7A, "Quantitative and Qualitative Disclosures About Market Risk".

Provision for Income Taxes

Provision for income taxes represents the estimated amount of federal, state, and foreign income taxes incurred in the U.S. and the many jurisdictions in which we operate. The provision includes the effect of reserve provisions and changes to reserves that are considered appropriate as well as the related net interest and penalties.

For additional details, including a reconciliation of the U.S. federal statutory rate to our effective tax rate, see Note 14 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K.

Executive Overview

The following table summarizes consolidated financial results for the years ended December 31, 2020 and 2021 unless otherwise specified (in millions, except for per share information and percentages):

	Year Ended December 31,		\$ Change	% Change
	2020	2021		
Consolidated revenues	\$ 182,527	\$ 257,637	\$ 75,110	41%
Change in consolidated constant currency revenues				39%
Cost of revenues	\$ 84,732	\$ 110,939	\$ 26,207	31%
Operating expenses	\$ 56,571	\$ 67,984	\$ 11,413	20%
Operating income	\$ 41,224	\$ 78,714	\$ 37,490	91%
Operating margin	23%	31%		8%
Other income (expense), net	\$ 6,858	\$ 12,020	\$ 5,162	75%
Net Income	\$ 40,269	\$ 76,033	\$ 35,764	89%
Diluted EPS	\$ 58.61	\$ 112.20	\$ 53.59	91%
Number of Employees	135,301	156,500	21,199	16%

- Revenues were \$257.6 billion, an increase of 41%. The increase in revenues was primarily driven by Google Services and Google Cloud. The adverse effect of COVID-19 on 2020 advertising revenues also contributed to the year-over-year growth.
- Cost of revenues was \$110.9 billion, an increase of 31%, primarily driven by increases in TAC and content acquisition costs. An overall increase in data centers and other operations costs was partially offset by a reduction in depreciation expense due to the change in the estimated useful life of our servers and certain network equipment.
- Operating expenses were \$68.0 billion, an increase of 20%, primarily driven by headcount growth, increases in advertising and promotional expenses and charges related to legal matters.

Other information:

- Operating cash flow was \$91.7 billion, primarily driven by revenues generated from our advertising products.
- Share repurchases were \$50.3 billion, an increase of 62%. See Note 11 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for further information.
- Capital expenditures, which primarily reflected investments in technical infrastructure, were \$24.6 billion.
- In January 2021, we updated the useful lives of certain of our servers and network equipment, resulting in a reduction in depreciation expense of \$2.6 billion recorded primarily in cost of revenues and R&D. See Note 1 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for further information.
- Our acquisition of Fitbit closed in early January 2021, and the related revenues are included in Google other. See Note 8 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for further information.
- On February 1, 2022, the Company announced that the Board of Directors had approved and declared a 20-for-one stock split in the form of a one-time special stock dividend on each share of the Company's Class A, Class B, and Class C stock. See Note 11 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for additional information.

The Effect of COVID-19 on our Financial Results

We began to observe the effect of COVID-19 on our financial results in March 2020 when, despite an increase in users' search activity, our advertising revenues declined compared to the prior year. This was due to a shift of user search activity to less commercial topics and reduced spending by our advertisers. For the quarter ended June 30, 2020 our advertising revenues declined due to the continued effects of COVID-19 and the related reductions in global economic activity, but we observed a gradual return in user search activity to more commercial topics. This was followed by increased spending by our advertisers, which continued throughout the

second half of 2020. Additionally, over the course of 2020, we experienced variability in our margins as many of our expenses are less variable in nature and/or may not correlate to changes in revenues. Market volatility contributed to fluctuations in the valuation of our equity investments. Further, our assessment of the credit deterioration of our customers due to changes in the macroeconomic environment during the period was reflected in our allowance for credit losses for accounts receivable.

Throughout 2021 we remained focused on innovating and investing in the services we offer to consumers and businesses to support our long-term growth. The impact of COVID-19 on 2020 financial results affected year-over-year growth trends. The COVID-19 pandemic continues to evolve, be unpredictable and affect our business and financial results. Our past results may not be indicative of our future performance, and historical trends in our financial results may differ materially.

Financial Results

Revenues

The following table presents revenues by type (in millions):

	Year Ended December 31,	
	2020	2021
Google Search & other	\$ 104,062	\$ 148,951
YouTube ads	19,772	28,845
Google Network	23,090	31,701
Google advertising	146,924	209,497
Google other	21,711	28,032
Google Services total	168,635	237,529
Google Cloud	13,059	19,206
Other Bets	657	753
Hedging gains (losses)	176	149
Total revenues	\$ 182,527	\$ 257,637

Google Services

GOOGLE ADVERTISING REVENUES

Google Search & other

Google Search & other revenues increased \$44.9 billion from 2020 to 2021. The overall growth was driven by interrelated factors including increases in search queries resulting from growth in user adoption and usage, primarily on mobile devices, growth in advertiser spending, and improvements we have made in ad formats and delivery. The adverse effect of COVID-19 on 2020 revenues also contributed to the year-over-year increase.

YouTube ads

YouTube ads revenues increased \$9.1 billion from 2020 to 2021. Growth was driven by our direct response and brand advertising products. Growth for our direct response advertising products was primarily driven by increased advertiser spending as well as improvements to ad formats and delivery. Growth for our brand advertising products was primarily driven by increased spending by our advertisers and the adverse effect of COVID-19 on 2020 revenues.

Google Network

Google Network revenues increased \$8.6 billion from 2020 to 2021. The growth was primarily driven by strength in AdMob, Google Ad Manager, and AdSense. The adverse effect of COVID-19 on 2020 revenues also contributed to the year-over-year increase.

MONETIZATION METRICS

Paid clicks and cost-per-click

The following table presents changes in paid clicks and cost-per-click (expressed as a percentage) from 2020 to 2021:

	Year Ended December 31,
	2021
Paid clicks change	23%
Cost-per-click change	15%

Paid clicks increased from 2020 to 2021 driven by a number of interrelated factors, including an increase in search queries resulting from growth in user adoption and usage, primarily on mobile devices; an increase in clicks relating to ads on Google Play; growth in advertiser spending; and improvements we have made in ad formats and delivery. The adverse effect of COVID-19 on 2020 paid clicks also contributed to the increase.

The increase in cost-per-click from 2020 to 2021 was driven by a number of interrelated factors including changes in device mix, geographic mix, growth in advertiser spending, ongoing product changes, and property mix, as well as the adverse effect of COVID-19 in 2020.

Impressions and cost-per-impression

The following table presents changes in impressions and cost-per-impression (expressed as a percentage) from 2020 to 2021:

	Year Ended December 31,
	2021
Impressions change	2%
Cost-per-impression change	35%

Impressions increased from 2020 to 2021 primarily driven by growth in AdMob, partially offset by a decline in impressions related to AdSense. The increase in cost-per-impression was primarily driven by the adverse effect of COVID-19 in 2020 as well as the effect of interrelated factors including ongoing product and policy changes and improvements we have made in ad formats and delivery, changes in device mix, geographic mix, product mix, and property mix.

GOOGLE OTHER REVENUES

Google other revenues increased \$6.3 billion from 2020 to 2021. The growth was primarily driven by YouTube non-advertising and hardware, followed by Google Play. Growth for YouTube non-advertising was primarily due to an increase in paid subscribers. Growth in hardware reflects the inclusion of Fitbit revenues, as the acquisition closed in January 2021, and an increase in phone sales. Growth for Google Play was primarily driven by sales of apps and in-app purchases.

Google Cloud

Google Cloud revenues increased \$6.1 billion from 2020 to 2021. The growth was primarily driven by GCP followed by Google Workspace offerings. Google Cloud's infrastructure and platform services were the largest drivers of growth in GCP.

Revenues by Geography

The following table presents revenues by geography as a percentage of revenues, determined based on the addresses of our customers:

	Year Ended December 31,	
	2020	2021
United States	47%	46%
EMEA	30%	31%
APAC	18%	18%
Other Americas	5%	5%

For further details on revenues by geography, see Note 2 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K.

Use of Constant Currency Revenues and Constant Currency Revenue Percentage Change

The effect of currency exchange rates on our business is an important factor in understanding period to period comparisons. We use non-GAAP constant currency revenues and non-GAAP percentage change in constant currency revenues for financial and operational decision-making and as a means to evaluate period-to-period comparisons. We believe the presentation of results on a constant currency basis in addition to U.S. Generally Accepted Accounting Principles (GAAP) results helps improve the ability to understand our performance because it excludes the effects of foreign currency volatility that are not indicative of our core operating results.

Constant currency information compares results between periods as if exchange rates had remained constant period over period. We define constant currency revenues as total revenues excluding the effect of foreign exchange rate movements and hedging activities, and use it to determine the constant currency revenue percentage change on a year-on-year basis. Constant currency revenues are calculated by translating current period revenues using prior year comparable period exchange rates, as well as excluding any hedging effects realized in the current period.

Constant currency revenue percentage change is calculated by determining the change in current period revenues over prior year comparable period revenues where current period foreign currency revenues are translated using prior year comparable period exchange rates and hedging effects are excluded from revenues of both periods.

These results should be considered in addition to, not as a substitute for, results reported in accordance with GAAP. Results on a constant currency basis, as we present them, may not be comparable to similarly titled measures used by other companies and are not a measure of performance presented in accordance with GAAP.

The following table presents the foreign exchange effect on international revenues and total revenues (in millions, except percentages):

	Year Ended December 31,		% Change from Prior Year
	2020	2021	
EMEA revenues	\$ 55,370	\$ 79,107	43%
EMEA constant currency revenues		76,321	38%
APAC revenues	32,550	46,123	42%
APAC constant currency revenues		45,666	40%
Other Americas revenues	9,417	14,404	53%
Other Americas constant currency revenues		14,317	52%
United States revenues	85,014	117,854	39%
Hedging gains (losses)	176	149	
Total revenues	\$ 182,527	\$ 257,637	41%
Revenues, excluding hedging effect	\$ 182,351	\$ 257,488	
Exchange rate effect		(3,330)	
Total constant currency revenues		\$ 254,158	39%

EMEA revenue growth from 2020 to 2021 was favorably affected by foreign currency exchange rates, primarily due to the U.S. dollar weakening relative to the Euro and British pound.

APAC revenue growth from 2020 to 2021 was favorably affected by foreign currency exchange rates, primarily due to the U.S. dollar weakening relative to the Australian dollar, partially offset by the U.S. dollar strengthening relative to the Japanese yen.

Other Americas growth change from 2020 to 2021 was favorably affected by changes in foreign currency exchange rates, primarily due to the U.S. dollar weakening relative to the Canadian dollar, partially offset by the U.S. dollar strengthening relative to the Argentine peso and the Brazilian real.

Costs and Expenses

COST OF REVENUES

The following tables present cost of revenues, including TAC (in millions, except percentages):

	Year Ended December 31,	
	2020	2021
TAC	\$ 32,778	\$ 45,566
Other cost of revenues	51,954	65,373
Total cost of revenues	\$ 84,732	\$ 110,939
Total cost of revenues as a percentage of revenues	46.4%	43.1%

Cost of revenues increased \$26.2 billion from 2020 to 2021. The increase was due to an increase in other cost of revenues and TAC of \$13.4 billion and \$12.8 billion, respectively.

The increase in TAC from 2020 to 2021 was due to an increase in TAC paid to distribution partners and to Google Network partners, primarily driven by growth in revenues subject to TAC. The TAC rate decreased from 22.3% to 21.8% from 2020 to 2021 primarily due to a revenue mix shift from Google Network properties to Google Search & other properties. The TAC rate on Google Search & other properties revenues and the TAC rate on Google Network revenues were both substantially consistent from 2020 to 2021.

The increase in other cost of revenues from 2020 to 2021 was driven by increases in content acquisition costs primarily for YouTube, data center and other operations costs, and hardware costs. The increase in data center and other operations costs was partially offset by a reduction in depreciation expense due to the change in the estimated useful life of our servers and certain network equipment beginning in the first quarter of 2021.

RESEARCH AND DEVELOPMENT

The following table presents R&D expenses (in millions, except percentages):

	Year Ended December 31,	
	2020	2021
Research and development expenses	\$ 27,573	\$ 31,562
Research and development expenses as a percentage of revenues	15.1%	12.3%

R&D expenses increased \$4.0 billion from 2020 to 2021. The increase was primarily due to an increase in compensation expenses of \$3.5 billion, largely resulting from an 11% increase in headcount, and an increase in professional service fees of \$516 million. This increase was partially offset by a reduction in depreciation expense of \$450 million including the effect of our change in the estimated useful life of our servers and certain network equipment.

SALES AND MARKETING

The following table presents sales and marketing expenses (in millions, except percentages):

	Year Ended December 31,	
	2020	2021
Sales and marketing expenses	\$ 17,946	\$ 22,912
Sales and marketing expenses as a percentage of revenues	9.8%	8.9%

Sales and marketing expenses increased \$5.0 billion from 2020 to 2021, primarily driven by an increase in advertising and promotional activities of \$2.5 billion and an increase in compensation expenses of \$2.2 billion. The increase in advertising and promotional activities was driven by both increased spending in the current period and a reduction in spending in 2020 due to COVID-19. The increase in compensation expenses was largely due to a 14% increase in headcount.

GENERAL AND ADMINISTRATIVE

The following table presents general and administrative expenses (in millions, except percentages):

	Year Ended December 31,	
	2020	2021
General and administrative expenses	\$ 11,052	\$ 13,510
General and administrative expenses as a percentage of revenues	6.1%	5.2%

General and administrative expenses increased \$2.5 billion from 2020 to 2021. The increase was primarily driven by a \$1.7 billion increase in charges relating to legal matters and a \$664 million increase in compensation expenses, largely resulting from a 14% increase in headcount. These increases were partially offset by a reduction in expense of \$808 million related to a decline in allowance for credit losses for accounts receivable, as 2020 reflected a higher allowance related to the economic effect of COVID-19.

SEGMENT PROFITABILITY

The following table presents segment operating income (loss) (in millions).

	Year Ended December 31,	
	2020	2021
Operating income (loss):		
Google Services	\$ 54,606	\$ 91,855
Google Cloud	(5,607)	(3,099)
Other Bets	(4,476)	(5,281)
Corporate costs, unallocated ⁽¹⁾	(3,299)	(4,761)
Total income from operations	\$ 41,224	\$ 78,714

(1) Unallocated corporate costs primarily include corporate initiatives, corporate shared costs, such as finance and legal, including certain fines and settlements, as well as costs associated with certain shared R&D activities. Additionally, hedging gains (losses) related to revenue are included in corporate costs.

GOOGLE SERVICES

Google services operating income increased \$37.2 billion from 2020 to 2021. The increase was due to growth in revenues partially offset by increases in TAC, content acquisition costs, compensation expenses, advertising and promotional expenses, and charges related to certain legal matters. The increase in expenses was partially offset by a reduction in costs driven by the change in the estimated useful life of our servers and certain network equipment. The effect of COVID-19 on 2020 results affected the year-over-year increase in operating income.

GOOGLE CLOUD

Google Cloud operating loss decreased \$2.5 billion from 2020 to 2021. The decrease in operating loss was primarily driven by growth in revenues, partially offset by an increase in expenses, primarily driven by compensation expenses. The increase in expenses was partially offset by a reduction in costs driven by the change in the estimated useful life of our servers and certain network equipment.

OTHER BETS

Other Bets operating loss increased \$805 million from 2020 to 2021. The increase in operating loss was primarily driven by increases in compensation expenses, including an increase in valuation-based compensation charges during the second quarter of 2021.

OTHER INCOME (EXPENSE), NET

The following table presents other income (expense), net, (in millions):

	Year Ended December 31,	
	2020	2021
Other income (expense), net	\$ 6,858	\$ 12,020

Other income (expense), net, increased \$5.2 billion from 2020 to 2021. The increase was primarily driven by increases in net unrealized gains recognized for our marketable and non-marketable equity securities of \$6.9 billion, partially offset by an increase in accrued performance fees related to certain investments of \$1.3 billion.

See Note 3 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for further information.

PROVISION FOR INCOME TAXES

The following table presents provision for income taxes (in millions, except for effective tax rate):

	Year Ended December 31,	
	2020	2021
Provision for income taxes	\$ 7,813	\$ 14,701
Effective tax rate	16.2%	16.2%

The provision for income taxes increased from 2020 to 2021, primarily due to an increase in pre-tax earnings, including in countries that have higher statutory rates, partially offset by an increase in the stock-based compensation related tax benefit, and the U.S. federal Foreign-Derived Intangible Income tax deduction benefit. Our effective tax rate was substantially consistent from 2020 to 2021. See Note 14 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for further information.

Financial Condition

Cash, Cash Equivalents, and Marketable Securities

As of December 31, 2021, we had \$139.6 billion in cash, cash equivalents, and short-term marketable securities. Cash equivalents and marketable securities are comprised of time deposits, money market funds, highly liquid government bonds, corporate debt securities, mortgage-backed and asset-backed securities, and marketable equity securities.

Sources, Uses of Cash and Related Trends

Our principal sources of liquidity are cash, cash equivalents, and marketable securities, as well as the cash flow that we generate from operations. The primary use of capital continues to be to invest for the long-term growth of the business. We regularly evaluate our cash and capital structure, including the size, pace and form of capital return to stockholders.

The following table presents our cash flows (in millions):

	Year Ended December 31,	
	2020	2021
Net cash provided by operating activities	\$ 65,124	\$ 91,652
Net cash used in investing activities	\$ (32,773)	\$ (35,523)
Net cash used in financing activities	\$ (24,408)	\$ (61,362)

CASH PROVIDED BY OPERATING ACTIVITIES

Our largest source of cash provided by operations are advertising revenues generated by Google Search & other properties, Google Network properties, and YouTube ads. Additionally, we generate cash through sales of apps and in-app purchases, digital content products, and hardware; and licensing and service fees including fees received for Google Cloud offerings and subscription-based products.

Our primary uses of cash from operating activities include payments to distribution and Google Network partners, for compensation and related costs, and for content acquisition costs. In addition, uses of cash from operating activities include hardware inventory costs, income taxes, and other general corporate expenditures.

Net cash provided by operating activities increased from 2020 to 2021 primarily due to the net effect of an increase in cash received from revenues and cash paid for cost of revenues and operating expenses, and changes in operating assets and liabilities.

CASH USED IN INVESTING ACTIVITIES

Cash provided by investing activities consists primarily of maturities and sales of our investments in marketable and non-marketable securities. Cash used in investing activities consists primarily of purchases of marketable and non-marketable securities, purchases of property and equipment, and payments for acquisitions.

Net cash used in investing activities increased from 2020 to 2021 primarily due to a decrease in maturities and sales of marketable securities, an increase in purchases of property and equipment, offset by a decrease in purchases of non-marketable securities.

CASH USED IN FINANCING ACTIVITIES

Cash provided by financing activities consists primarily of proceeds from issuance of debt and proceeds from the sale of interest in consolidated entities. Cash used in financing activities consists primarily of repurchases of common and capital stock, net payments related to stock-based award activities, and repayments of debt.

Net cash used in financing activities increased from 2020 to 2021 primarily due to repayment of debt and an increase in cash payments for repurchases of common and capital stock.

Liquidity and Material Cash Requirements

We expect existing cash, cash equivalents, short-term marketable securities, cash flows from operations and financing activities to continue to be sufficient to fund our operating activities and cash commitments for investing and financing activities for at least the next 12 months and thereafter for the foreseeable future.

CAPITAL EXPENDITURES AND LEASES

We make investments in land and buildings for data centers and offices and information technology assets through purchases of property and equipment and lease arrangements to provide capacity for the growth of our services and products.

Capital Expenditures

Our capital investments in property and equipment consist primarily of the following major categories:

- technical infrastructure, which consists of our investments in servers and network equipment for computing, storage and networking requirements for ongoing business activities, including machine learning (collectively referred to as our information technology assets) and data center land and building construction; and
- office facilities, ground up development projects and related building improvements.

Construction in progress consists primarily of technical infrastructure and office facilities which have not yet been placed in service for our intended use. The time frame from date of purchase to placement in service of these assets may extend from months to years. For example, our data center construction projects are generally multi-year projects with multiple phases, where we acquire qualified land and buildings, construct buildings, and secure and install information technology assets.

During the years ended December 31, 2020 and 2021, we spent \$22.3 billion and \$24.6 billion on capital expenditures, respectively. Depreciation of our property and equipment commences when the deployment of such assets are completed and are ready for our intended use. Land is not depreciated. For the years ended December 31, 2020 and 2021, our depreciation and impairment expenses on property and equipment were \$12.9 billion and \$11.6 billion, respectively.

Leases

For the years ended December 31, 2020 and 2021, we recognized total operating lease assets of \$2.8 billion and \$3.0 billion, respectively. As of December 31, 2021, the amount of total future lease payments under operating leases, which had a weighted average remaining lease term of 8 years, was \$15.5 billion, of which \$2.5 billion is short-term. As of December 31, 2021, we have entered into leases that have not yet commenced with future short-term and long-term lease payments of \$606 million and \$5.2 billion, excluding purchase options, that are not yet recorded on our Consolidated Balance Sheets. These leases will commence between 2022 and 2026 with non-cancelable lease terms of 1 to 25 years.

For the years ended December 31, 2020 and 2021, our operating lease expenses (including variable lease costs) were \$2.9 billion and \$3.4 billion, respectively. Finance lease costs were not material for the years ended December 31, 2020 and 2021. See Note 4 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for further information on leases.

FINANCING

We have a short-term debt financing program of up to \$10.0 billion through the issuance of commercial paper, which increased from \$5.0 billion in September 2021. Net proceeds from this program are used for general corporate purposes. As of December 31, 2021, we had no commercial paper outstanding.

As of December 31, 2021, we had \$10.0 billion of revolving credit facilities with no amounts outstanding. In April 2021, we terminated the existing revolving credit facilities, which were scheduled to expire in July 2023, and entered into two new revolving credit facilities in the amounts of \$4.0 billion and \$6.0 billion, which will expire in April 2022 and April 2026, respectively. The interest rates for the new credit facilities are determined based on a formula using certain market rates, as well as our progress toward the achievement of certain sustainability goals. No amounts have been borrowed under the new credit facilities.

As of December 31, 2021, we have senior unsecured notes outstanding with a total carrying value of \$12.8 billion with short-term and long-term future interest payments of \$231 million and \$4.0 billion, respectively. See Note 6 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for further information on our debt.

SHARE REPURCHASE PROGRAM

In April 2021, the Board of Directors of Alphabet authorized the company to repurchase up to \$50.0 billion of its Class C stock. In July 2021, the Alphabet board approved an amendment to the April 2021 authorization, permitting the company to repurchase both Class A and Class C shares in a manner deemed in the best interest of the company and its stockholders, taking into account the economic cost and prevailing market conditions, including the relative trading prices and volumes of the Class A and Class C shares. In accordance with the authorizations of the Board of Directors of Alphabet, during 2021 we repurchased and subsequently retired 20.3 million aggregate shares for \$50.3 billion. Of the aggregate amount repurchased and subsequently retired, 1.2 million shares were Class A stock repurchased for \$3.4 billion. As of December 31, 2021, \$17.4 billion remains available for Class A and Class C share repurchases under the amended authorization. The repurchases are being executed from time to time, subject to general business and market conditions and other investment opportunities, through open market purchases or privately negotiated transactions, including through Rule 10b5-1 plans. The repurchase program does not have an expiration date. See Note 11 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K.

EUROPEAN COMMISSION FINES

In 2017, 2018 and 2019, the EC announced decisions that certain actions taken by Google infringed European competition law and imposed fines of €2.4 billion (\$2.7 billion as of June 27, 2017), €4.3 billion (\$5.1 billion as of June 30, 2018), and €1.5 billion (\$1.7 billion as of March 20, 2019), respectively. While each EC decision is under appeal, we included the fines in accrued expenses and other current liabilities on our Consolidated Balance Sheets as we provided bank guarantees (in lieu of a cash payment) for the fines.

TAXES

As of December 31, 2021, we had short-term and long-term income taxes payable of \$784 million and \$5.7 billion related to a one-time transition tax payable incurred as a result of the U.S. Tax Cuts and Jobs Act ("Tax Act"). As permitted by the Tax Act, we will pay the transition tax in annual interest-free installments through 2025. We also have taxes payable of \$3.5 billion primarily related to uncertain tax positions as of December 31, 2021.

PURCHASE COMMITMENTS

We regularly enter into significant non-cancelable contractual obligations primarily related to data center operations and build-outs, information technology assets, office buildings, purchases of inventory, and network capacity arrangements. As of December 31, 2021, such purchase commitments, which do not qualify for recognition on our Consolidated Balance Sheets, amount to \$13.7 billion, of which \$11.9 billion is short-term. These amounts represent the non-cancelable portion of agreements or the minimum cancellation fee. For those agreements with variable terms, we do not estimate the non-cancelable obligation beyond any minimum quantities and/or pricing as of December 31, 2021.

Critical Accounting Estimates

We prepare our consolidated financial statements in accordance with GAAP. In doing so, we have to make estimates and assumptions. Our critical accounting estimates are those estimates that involve a significant level of uncertainty at the time the estimate was made, and changes in them have had or are reasonably likely to have a material effect on our financial condition or results of operations. Accordingly, actual results could differ materially from our estimates. We base our estimates on past experience and other assumptions that we believe are reasonable under the circumstances, and we evaluate these estimates on an ongoing basis. We have reviewed our critical accounting estimates with the audit and compliance committee of our Board of Directors.

See Note 1 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for a summary of significant accounting policies and the effect on our financial statements.

Fair Value Measurements of Non-Marketable Equity Securities

We measure certain financial instruments at fair value on a nonrecurring basis, consisting primarily of our non-marketable equity securities. These investments are accounted for under the measurement alternative and are measured at cost, less impairment,

subject to upward and downward adjustments resulting from observable price changes for identical or similar investments of the same issuer. These adjustments require quantitative assessments of the fair value of our securities, which may require the use of unobservable inputs. Pricing adjustments are determined by using various valuation methodologies and involve the use of estimates using the best information available, which may include cash flow projections or other available market data.

Non-marketable equity securities are also evaluated for impairment, based on qualitative factors including the companies' financial and liquidity position and access to capital resources, among others. When indicators of impairment exist, we prepare quantitative measurements of the fair value of our equity investments using a market approach or an income approach, which requires judgment and the use of unobservable inputs, including discount rates, investee revenues and costs, and comparable market data of private and public companies, among others. When our assessment indicates that an impairment exists, we write down the investment to its fair value.

We also have compensation arrangements with payouts based on realized returns from certain investments, i.e. performance fees. We recognize compensation expense based on the estimated payouts, which may result in expense recognized before investment returns are realized, and may require the use of unobservable inputs.

Property and Equipment

We assess the reasonableness of the useful lives of our property and equipment periodically as well as when other changes occur, such as when there are changes to ongoing business operations, changes in the planned use and utilization of assets, or technological advancements, that could indicate a change in the period over which we expect to benefit from the assets.

Income Taxes

We are subject to income taxes in the U.S. and foreign jurisdictions. Significant judgment is required in evaluating our uncertain tax positions and determining our provision for income taxes.

Recording an uncertain tax position involves various qualitative considerations, including evaluation of comparable and resolved tax exposures, applicability of tax laws, and likelihood of settlement. We evaluate uncertain tax positions periodically, considering changes in facts and circumstances, such as new regulations or recent judicial opinions, as well as the status of audit activities by taxing authorities. Although we believe we have adequately reserved for our uncertain tax positions, no assurance can be given that the final tax outcome of these matters will not be different. To the extent that the final tax outcome of these matters is different than the amounts recorded, such differences will affect the provision for income taxes and the effective tax rate in the period in which such determination is made.

The provision for income taxes includes the effect of reserve provisions and changes to reserves that are considered appropriate as well as the related net interest and penalties. In addition, we are subject to the continuous examination of our income tax returns by the Internal Revenue Services (IRS) and other tax authorities which may assert assessments against us. We regularly assess the likelihood of adverse outcomes resulting from these examinations and assessments to determine the adequacy of our provision for income taxes.

Loss Contingencies

We are regularly subject to claims, suits, regulatory and government investigations, and other proceedings involving competition, intellectual property, privacy, tax and related compliance, labor and employment, commercial disputes, content generated by our users, goods and services offered by advertisers or publishers using our platforms, personal injury consumer protection, and other matters. Certain of these matters include speculative claims for substantial or indeterminate amounts of damages. We record a liability when we believe that it is probable that a loss has been incurred and the amount can be reasonably estimated. If we determine that a loss is reasonably possible and the loss or range of loss can be estimated, we disclose the possible loss in Note 10 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K.

We evaluate, on a regular basis, developments in our legal matters that could affect the amount of liability that has been previously accrued, and the matters and related reasonably possible losses disclosed, and make adjustments and changes to our disclosures as appropriate. Significant judgment is required to determine both the likelihood and the estimated amount of a loss related to such matters. Until the final resolution of such matters, there may be an exposure to loss in excess of the amount recorded, and such amounts could be material.

Change in Accounting Estimate

In January 2021, we completed an assessment of the useful lives of our servers and certain network equipment. In doing so, we determined we should adjust the estimated useful life. This change in accounting estimate was effective beginning fiscal year 2021 and is detailed further in Note 1 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K.

— ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We are exposed to financial market risks, including changes in foreign currency exchange rates, interest rates, and equity investment risks.

Foreign Currency Exchange Risk

We transact business globally in multiple currencies. International revenues, as well as costs and expenses denominated in foreign currencies, expose us to the risk of fluctuations in foreign currency exchange rates against the U.S. dollar. Principal currencies hedged included the Australian dollar, British pound, Canadian dollar, Euro, and Japanese yen. For the purpose of analyzing foreign currency exchange risk, we considered the historical trends in foreign currency exchange rates and determined that it was reasonably possible that adverse changes in exchange rates of 10% could be experienced in the near term.

We use foreign exchange forward contracts to offset the foreign exchange risk on assets and liabilities denominated in currencies other than the functional currency of the subsidiary. These forward contracts reduce, but do not entirely eliminate, the effect of foreign currency exchange rate movements on our assets and liabilities. The foreign currency gains and losses on these assets and liabilities are recorded in other income (expense), net, which are offset by the gains and losses on the forward contracts.

If an adverse 10% foreign currency exchange rate change was applied to total monetary assets, liabilities, and commitments denominated in currencies other than the functional currencies at the balance sheet date, it would have resulted in an adverse effect on income before income taxes of approximately \$497 million and \$285 million as of December 31, 2020 and 2021, respectively, after consideration of the effect of foreign exchange contracts in place for the years ended December 31, 2020 and 2021.

We use foreign currency forwards and option contracts, including collars (an option strategy comprised of a combination of purchased and written options) to protect forecasted U.S. dollar-equivalent earnings from changes in foreign currency exchange rates. When the U.S. dollar strengthens, gains from foreign currency options and forwards reduce the foreign currency losses related to our earnings. When the U.S. dollar weakens, losses from foreign currency collars and forwards offset the foreign currency gains related to our earnings. These hedging contracts reduce, but do not entirely eliminate, the effect of foreign currency exchange rate movements. We designate these contracts as cash flow hedges for accounting purposes. We reflect the gains or losses of foreign currency spot rate changes as a component of AOCI and subsequently reclassify them into revenues to offset the hedged exposures as they occur.

If the U.S. dollar weakened by 10% as of December 31, 2020 and 2021, the amount recorded in AOCI related to our foreign exchange contracts before tax effect would have been approximately \$912 million and \$1.3 billion lower as of December 31, 2020 and 2021, respectively. The change in the value recorded in AOCI would be expected to offset a corresponding foreign currency change in forecasted hedged revenues when recognized.

We use foreign exchange forward contracts designated as net investment hedges to hedge the foreign currency risks related to investment in foreign subsidiaries. These forward contracts serve to offset the foreign currency translation risk from our foreign operations.

If the U.S. dollar weakened by 10%, the amount recorded in cumulative translation adjustment (CTA) within AOCI related to our net investment hedge would have been approximately \$1.0 billion lower as of both December 31, 2020 and 2021. The change in value recorded in CTA would be expected to offset a corresponding foreign currency translation gain or loss from our investment in foreign subsidiaries.

Interest Rate Risk

Our Corporate Treasury investment strategy is to achieve a return that will allow us to preserve capital and maintain liquidity. We invest primarily in debt securities, including those of the U.S. government and its agencies, corporate debt securities, mortgage-backed securities, money market and other funds, municipal securities, time deposits, asset backed securities, and debt instruments issued by foreign governments. By policy, we limit the amount of credit exposure to any one issuer. Our investments in both fixed rate and floating rate interest earning securities carry a degree of interest rate risk. Fixed rate securities may have their fair market value adversely affected due to a rise in interest rates, while floating rate securities may produce less income than predicted if interest rates fall. Unrealized gains or losses on our marketable debt securities are primarily due to interest rate fluctuations as compared to interest rates at the time of purchase. For certain fixed and variable rate debt securities, we have elected the fair value option for which changes in fair value are recorded in other income (expense), net. We measure securities for which we have not elected the fair value option at fair value with gains and losses recorded in AOCI until the securities are sold, less any expected credit losses.

We use value-at-risk (VaR) analysis to determine the potential effect of fluctuations in interest rates on the value of our marketable debt security portfolio. The VaR is the expected loss in fair value, for a given confidence interval, for our investment portfolio due to adverse movements in interest rates. We use a variance/covariance VaR model with 95% confidence interval. The estimated one-day loss in fair value of marketable debt securities as of December 31, 2020 and 2021 are shown below (in millions):

	As of December 31,		12-Month Average As of December 31,	
	2020	2021	2020	2021
Risk Category - Interest Rate	\$ 144	\$ 139	\$ 145	\$ 148

Actual future gains and losses associated with our marketable debt security portfolio may differ materially from the sensitivity analyses performed as of December 31, 2020 and 2021 due to the inherent limitations associated with predicting the timing and amount of changes in interest rates and our actual exposures and positions. VaR analysis is not intended to represent actual losses but is used as a risk estimation.

Equity Investment Risk

Our marketable and non-marketable equity securities are subject to a wide variety of market-related risks that could substantially reduce or increase the fair value of our holdings.

Our marketable equity securities are publicly traded stocks or funds and our non-marketable equity securities are investments in privately held companies, some of which are in the startup or development stages.

We record marketable equity securities not accounted for under the equity method at fair value based on readily determinable market values, of which publicly traded stocks and mutual funds are subject to market price volatility, and represent \$5.9 billion and \$7.8 billion of our investments as of December 31, 2020 and 2021, respectively. A hypothetical adverse price change of 10% on our December 31, 2021 balance, which could be experienced in the near term, would decrease the fair value of marketable equity securities by \$780 million. From time to time, we may enter into derivatives to hedge the market price risk on certain of our marketable equity securities.

Our non-marketable equity securities not accounted for under the equity method are adjusted to fair value for observable transactions for identical or similar investments of the same issuer or impairment (referred to as the measurement alternative). The fair value measured at the time of the observable transaction is not necessarily an indication of the current fair value as of the balance sheet date. These investments, especially those that are in the early stages, are inherently risky because the technologies or products these companies have under development are typically in the early phases and may never materialize, and they may experience a decline in financial condition, which could result in a loss of a substantial part of our investment in these companies. The success of our investment in any private company is also typically dependent on the likelihood of our ability to realize appreciation in the value of investments through liquidity events such as public offerings, acquisitions, private sales or other market events. As of December 31, 2020 and 2021, the carrying value of our non-marketable equity securities, which were accounted for under the measurement alternative, was \$18.9 billion and \$27.6 billion, respectively. Valuations of our equity investments in private companies are inherently more complex due to the lack of readily available market data. Volatility in the global economic climate and financial markets could result in a significant impairment charge relating to our non-marketable equity securities. Changes in valuation of non-marketable equity securities may not directly correlate with changes in valuation of marketable equity securities. Additionally, observable transactions at lower valuations could result in significant losses on our non-marketable equity securities. The effect of COVID-19 on our impairment assessment requires significant judgment due to the uncertainty around the duration and severity of the effect.

The carrying values of our equity method investments, which totaled approximately \$1.4 billion and \$1.5 billion as of December 31, 2020 and 2021, respectively, generally do not fluctuate based on market price changes. However, these investments could be impaired if the carrying value exceeds the fair value and is not expected to recover.

For further information about our equity investments, see Note 1 and Note 3 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K.

— ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Alphabet Inc. Index to Consolidated Financial Statements

REPORTS OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM	41
FINANCIAL STATEMENTS:	
CONSOLIDATED BALANCE SHEETS	44
CONSOLIDATED STATEMENTS OF INCOME	45
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME	46
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY	47
CONSOLIDATED STATEMENTS OF CASH FLOWS	48
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS	49

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Alphabet Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Alphabet Inc. (the Company) as of December 31, 2020 and 2021, the related consolidated statements of income, comprehensive income, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2021, and the related notes and financial statement schedule listed in the Index at Item 15 (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2020 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework), and our report dated February 1, 2022 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the U.S. Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of the critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

LOSS CONTINGENCIES

Description of the Matter	<p>The Company is regularly subject to claims, suits, regulatory and government investigations, and other proceedings involving competition, intellectual property, privacy, tax and related compliance, labor and employment, commercial disputes, content generated by its users, goods and services offered by advertisers or publishers using their platforms, personal injury, consumer protection, and other matters. As described in Note 10 to the consolidated financial statements "Contingencies" such claims, suits, regulatory and government investigations, and other proceedings could result in adverse consequences.</p> <p>Significant judgment is required to determine both the likelihood, and the estimated amount, of a loss related to such matters. Auditing management's accounting for and disclosure of loss contingencies from these matters involved challenging and subjective auditor judgment in assessing the Company's evaluation of the probability of a loss, and the estimated amount or range of loss.</p>
How We Addressed the Matter in Our Audit	<p>We tested relevant controls over the identified risks associated with management's accounting for and disclosure of these matters. This included controls over management's assessment of the probability of incurrence of a loss and whether the loss or range of loss was reasonably estimable and the development of related disclosures.</p> <p>Our audit procedures included gaining an understanding of previous rulings issued by regulators and the status of ongoing lawsuits, reviewing letters addressing the matters from internal and external legal counsel, meeting with internal legal counsel to discuss the allegations, and obtaining a representation letter from management on these matters. We also evaluated the Company's disclosures in relation to these matters.</p>

/s/ Ernst & Young LLP

We have served as the Company's auditor since 1999.

San Jose, California
February 1, 2022

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and the Board of Directors of Alphabet Inc.

Opinion on Internal Control over Financial Reporting

We have audited Alphabet Inc.'s internal control over financial reporting as of December 31, 2021, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework), (the COSO criteria). In our opinion, Alphabet Inc. (the Company) maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the 2021 consolidated financial statements of the Company and our report dated February 1, 2022 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the U.S. Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Ernst & Young LLP

San Jose, California
February 1, 2022

Alphabet Inc.

CONSOLIDATED BALANCE SHEETS

	As of December 31,	
<i>(In millions, except share amounts which are reflected in thousands, and par value per share amounts)</i>	2020	2021
Assets		
Current assets:		
Cash and cash equivalents	\$ 26,465	\$ 20,945
Marketable securities	110,229	118,704
Total cash, cash equivalents, and marketable securities	136,694	139,649
Accounts receivable, net	30,930	39,304
Income taxes receivable, net	454	966
Inventory	728	1,170
Other current assets	5,490	7,054
Total current assets	174,296	188,143
Non-marketable securities	20,703	29,549
Deferred income taxes	1,084	1,284
Property and equipment, net	84,749	97,599
Operating lease assets	12,211	12,959
Intangible assets, net	1,445	1,417
Goodwill	21,175	22,956
Other non-current assets	3,953	5,361
Total assets	\$ 319,616	\$ 359,268
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	\$ 5,589	\$ 6,037
Accrued compensation and benefits	11,086	13,889
Accrued expenses and other current liabilities	28,631	31,236
Accrued revenue share	7,500	8,996
Deferred revenue	2,543	3,288
Income taxes payable, net	1,485	808
Total current liabilities	56,834	64,254
Long-term debt	13,932	14,817
Deferred revenue, non-current	481	535
Income taxes payable, non-current	8,849	9,176
Deferred income taxes	3,561	5,257
Operating lease liabilities	11,146	11,389
Other long-term liabilities	2,269	2,205
Total liabilities	97,072	107,633
Contingencies (Note 10)		
Stockholders' equity:		
Preferred stock, \$0.001 par value per share, 100,000 shares authorized; no shares issued and outstanding	0	0
Class A and Class B common stock, and Class C capital stock and additional paid-in capital, \$0.001 par value per share: 15,000,000 shares authorized (Class A 9,000,000, Class B 3,000,000, Class C 3,000,000); 675,222 (Class A 300,730, Class B 45,843, Class C 328,649) and 662,121 (Class A 300,737, Class B 44,665, Class C 316,719) shares issued and outstanding	58,510	61,774
Accumulated other comprehensive income (loss)	633	(1,623)
Retained earnings	163,401	191,484
Total stockholders' equity	222,544	251,635
Total liabilities and stockholders' equity	\$ 319,616	\$ 359,268

See accompanying notes.

Alphabet Inc.

CONSOLIDATED STATEMENTS OF INCOME

(In millions, except per share amounts)	Year Ended December 31,		
	2019	2020	2021
Revenues	\$ 161,857	\$ 182,527	\$ 257,637
Costs and expenses:			
Cost of revenues	71,896	84,732	110,939
Research and development	26,018	27,573	31,562
Sales and marketing	18,464	17,946	22,912
General and administrative	9,551	11,052	13,510
European Commission fines	1,697	0	0
Total costs and expenses	127,626	141,303	178,923
Income from operations	34,231	41,224	78,714
Other income (expense), net	5,394	6,858	12,020
Income before income taxes	39,625	48,082	90,734
Provision for income taxes	5,282	7,813	14,701
Net income	\$ 34,343	\$ 40,269	\$ 76,033
Basic net income per share of Class A and B common stock and Class C capital stock	\$ 49.59	\$ 59.15	\$ 113.88
Diluted net income per share of Class A and B common stock and Class C capital stock	\$ 49.16	\$ 58.61	\$ 112.20

See accompanying notes.

Alphabet Inc.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

(In millions)	Year Ended December 31,		
	2019	2020	2021
Net income	\$ 34,343	\$ 40,269	\$ 76,033
Other comprehensive income (loss):			
Change in foreign currency translation adjustment	(119)	1,139	(1,442)
Available-for-sale investments:			
Change in net unrealized gains (losses)	1,611	1,313	(1,312)
Less: reclassification adjustment for net (gains) losses included in net income	(111)	(513)	(64)
Net change, net of income tax benefit (expense) of \$(221), \$(230), and \$394	1,500	800	(1,376)
Cash flow hedges:			
Change in net unrealized gains (losses)	22	42	716
Less: reclassification adjustment for net (gains) losses included in net income	(299)	(116)	(154)
Net change, net of income tax benefit (expense) of \$42, \$11, and \$(122)	(277)	(74)	562
Other comprehensive income (loss)	1,104	1,865	(2,256)
Comprehensive income	\$ 35,447	\$ 42,134	\$ 73,777

See accompanying notes.

Alphabet Inc.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(In millions, except share amounts which are reflected in thousands)	Class A and Class B Common Stock, Class C Capital Stock and Additional Paid-In Capital		Accumulated Other Comprehensive Income (Loss)	Retained Earnings	Total Stockholders' Equity
	Shares	Amount			
Balance as of December 31, 2018	695,556	\$ 45,049	\$ (2,306)	\$ 134,885	\$ 177,628
Cumulative effect of accounting change	0	0	(30)	(4)	(34)
Common and capital stock issued	8,120	202	0	0	202
Stock-based compensation expense	0	10,890	0	0	10,890
Income tax withholding related to vesting of restricted stock units and other	0	(4,455)	0	0	(4,455)
Repurchases of capital stock	(15,341)	(1,294)	0	(17,102)	(18,396)
Sale of interest in consolidated entities	0	160	0	0	160
Net income	0	0	0	34,343	34,343
Other comprehensive income (loss)	0	0	1,104	0	1,104
Balance as of December 31, 2019	688,335	50,552	(1,232)	152,122	201,442
Common and capital stock issued	8,398	168	0	0	168
Stock-based compensation expense	0	13,123	0	0	13,123
Income tax withholding related to vesting of restricted stock units and other	0	(5,969)	0	0	(5,969)
Repurchases of capital stock	(21,511)	(2,159)	0	(28,990)	(31,149)
Sale of interest in consolidated entities	0	2,795	0	0	2,795
Net income	0	0	0	40,269	40,269
Other comprehensive income (loss)	0	0	1,865	0	1,865
Balance as of December 31, 2020	675,222	58,510	633	163,401	222,544
Common and capital stock issued	7,225	12	0	0	12
Stock-based compensation expense	0	15,539	0	0	15,539
Income tax withholding related to vesting of restricted stock units and other	0	(10,273)	0	0	(10,273)
Repurchases of common and capital stock	(20,326)	(2,324)	0	(47,950)	(50,274)
Sale of interest in consolidated entities	0	310	0	0	310
Net income	0	0	0	76,033	76,033
Other comprehensive income (loss)	0	0	(2,256)	0	(2,256)
Balance as of December 31, 2021	662,121	\$ 61,774	\$ (1,623)	\$ 191,484	\$ 251,635

See accompanying notes.

Alphabet Inc.

CONSOLIDATED STATEMENTS OF CASH FLOWS

(In millions)	Year Ended December 31,		
	2019	2020	2021
Operating activities			
Net income	\$ 34,343	\$ 40,269	\$ 76,033
Adjustments:			
Depreciation and impairment of property and equipment	10,856	12,905	11,555
Amortization and impairment of intangible assets	925	792	886
Stock-based compensation expense	10,794	12,991	15,376
Deferred income taxes	173	1,390	1,808
Gain on debt and equity securities, net	(2,798)	(6,317)	(12,270)
Other	(592)	1,267	(213)
Changes in assets and liabilities, net of effects of acquisitions:			
Accounts receivable	(4,340)	(6,524)	(9,095)
Income taxes, net	(3,128)	1,209	(625)
Other assets	(621)	(1,330)	(1,846)
Accounts payable	428	694	283
Accrued expenses and other liabilities	7,170	5,504	7,304
Accrued revenue share	1,273	1,639	1,682
Deferred revenue	37	635	774
Net cash provided by operating activities	54,520	65,124	91,652
Investing activities			
Purchases of property and equipment	(23,548)	(22,281)	(24,640)
Purchases of marketable securities	(100,315)	(136,576)	(135,196)
Maturities and sales of marketable securities	97,825	132,906	128,294
Purchases of non-marketable securities	(1,932)	(7,175)	(2,838)
Maturities and sales of non-marketable securities	405	1,023	934
Acquisitions, net of cash acquired, and purchases of intangible assets	(2,515)	(738)	(2,618)
Other investing activities	589	68	541
Net cash used in investing activities	(29,491)	(32,773)	(35,523)
Financing activities			
Net payments related to stock-based award activities	(4,765)	(5,720)	(10,162)
Repurchases of common and capital stock	(18,396)	(31,149)	(50,274)
Proceeds from issuance of debt, net of costs	317	11,761	20,199
Repayments of debt	(585)	(2,100)	(21,435)
Proceeds from sale of interest in consolidated entities, net	220	2,800	310
Net cash used in financing activities	(23,209)	(24,408)	(61,362)
Effect of exchange rate changes on cash and cash equivalents	(23)	24	(287)
Net increase (decrease) in cash and cash equivalents	1,797	7,967	(5,520)
Cash and cash equivalents at beginning of period	16,701	18,498	26,465
Cash and cash equivalents at end of period	\$ 18,498	\$ 26,465	\$ 20,945
Supplemental disclosures of cash flow information			
Cash paid for income taxes, net of refunds	\$ 8,203	\$ 4,990	\$ 13,412

See accompanying notes.

— Alphabet Inc.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1. Summary of Significant Accounting Policies

Google was incorporated in California in September 1998 and re-incorporated in the State of Delaware in August 2003. In 2015, we implemented a holding company reorganization, and as a result, Alphabet Inc. ("Alphabet") became the successor issuer to Google.

Basis of Consolidation

The consolidated financial statements of Alphabet include the accounts of Alphabet and entities consolidated under the variable interest and voting models. All intercompany balances and transactions have been eliminated.

Use of Estimates

Preparation of consolidated financial statements in conformity with GAAP requires us to make estimates and assumptions that affect the amounts reported and disclosed in the financial statements and the accompanying notes. Actual results could differ materially from these estimates due to uncertainties, including the effects of COVID-19. On an ongoing basis, we evaluate our estimates, including those related to the allowance for credit losses; fair values of financial instruments, intangible assets, and goodwill; useful lives of intangible assets and property and equipment; income taxes; and contingent liabilities, among others. We base our estimates on assumptions, both historical and forward looking, that are believed to be reasonable, and the results of which form the basis for making judgments about the carrying values of assets and liabilities.

In January 2021, we completed an assessment of the useful lives of our servers and network equipment and adjusted the estimated useful life of our servers from three years to four years and the estimated useful life of certain network equipment from three years to five years. This change in accounting estimate was effective beginning in fiscal year 2021. Based on the carrying value of servers and certain network equipment as of December 31, 2020 and those acquired during the year ended December 31, 2021, the effect of this change in estimate was a reduction in depreciation expense of \$2.6 billion and an increase in net income of \$2.0 billion, or \$3.02 per basic share and \$2.98 per diluted share, for the year ended December 31, 2021.

Revenue Recognition

Revenues are recognized when control of the promised goods or services is transferred to our customers, and the collectibility of an amount that we expect in exchange for those goods or services is probable. Sales and other similar taxes are excluded from revenues.

ADVERTISING REVENUES

We generate advertising revenues primarily by delivering advertising on:

- Google Search and other properties, including revenues from traffic generated by search distribution partners who use Google.com as their default search in browsers, toolbars, etc. and other Google owned and operated properties like Gmail, Google Maps, and Google Play;
- YouTube properties; and
- Google Network properties, including revenues from Google Network properties participating in AdMob, AdSense, and Google Ad Manager.

Our customers generally purchase advertising inventory through Google Ads, Google Ad Manager, and Google Marketing Platform, among others.

We offer advertising by delivering both performance and brand advertising. We recognize revenues for performance advertising when a user engages with the advertisement, such as a click, a view, or a purchase. For brand advertising, we recognize revenues when the ad is displayed, or a user views the ad.

For ads placed on Google Network properties, we evaluate whether we are the principal (i.e., report revenues on a gross basis) or agent (i.e., report revenues on a net basis). Generally, we report advertising revenues for ads placed on Google Network properties on a gross basis, that is, the amounts billed to our customers are recorded as revenues, and amounts paid to Google Network partners are recorded as cost of revenues. Where we are the principal, we control the advertising inventory before it is transferred to our customers. Our control is evidenced by our sole ability to monetize the advertising inventory before it is transferred to our customers and is further supported by us being primarily responsible to our customers and having a level of discretion in establishing pricing.

GOOGLE CLOUD REVENUES

Google Cloud revenues consist of revenues from:

- Google Cloud Platform, which includes fees for infrastructure, platform, and other services;
- Google Workspace, which includes fees for cloud-based collaboration tools for enterprises, such as Gmail, Docs, Drive, Calendar, and Meet; and
- other enterprise services.

Our cloud services are generally provided on either a consumption or subscription basis and may have contract terms longer than a year. Revenues related to cloud services provided on a consumption basis are recognized when the customer utilizes the services, based on the quantity of services consumed. Revenues related to cloud services provided on a subscription basis are recognized ratably over the contract term as the customer receives and consumes the benefits of the cloud services.

GOOGLE OTHER REVENUES

Google other revenues consist of revenues from:

- Google Play, which includes sales of apps and in-app purchases and digital content sold in the Google Play store;
- hardware, which includes sales of Fitbit wearable devices, Google Nest home products, and Pixel phones;
- YouTube non-advertising, which includes YouTube Premium and YouTube TV subscriptions; and
- other products and services.

As it relates to Google other revenues, the most significant judgment is determining whether we are the principal or agent for app sales and in-app purchases through the Google Play store. We report revenues from these transactions on a net basis because our performance obligation is to facilitate a transaction between app developers and end users, for which we earn a service fee.

ARRANGEMENTS WITH MULTIPLE PERFORMANCE OBLIGATIONS

Our contracts with customers may include multiple performance obligations. For such arrangements, we allocate revenues to each performance obligation based on its relative standalone selling price. We generally determine standalone selling prices based on the prices charged to customers or using expected cost plus margin.

CUSTOMER INCENTIVES AND CREDITS

Certain customers receive cash-based incentives or credits, which are accounted for as variable consideration. We estimate these amounts based on the expected amount to be provided to customers and reduce revenues. We believe that there will not be significant changes to our estimates of variable consideration.

SALES COMMISSIONS

We expense sales commissions when incurred and when the amortization period (the period of the expected benefit) is one year or less. We recognize an asset for certain sales commissions if we expect the period of benefit of these costs to exceed one year and recognize the expense over the amortization period. These costs are recorded within sales and marketing expenses.

Cost of Revenues

Cost of revenues consists of TAC and other costs of revenues.

- TAC includes:
 - Amounts paid to our distribution partners who make available our search access points and services. Our distribution partners include browser providers, mobile carriers, original equipment manufacturers, and software developers.
 - Amounts paid to Google Network partners primarily for ads displayed on their properties.
- Other cost of revenues includes:
 - Content acquisition costs, which are payments to content providers from whom we license video and other content for distribution on YouTube and Google Play (we pay fees to these content providers based on revenues generated or a flat fee).
 - Expenses associated with our data centers (including bandwidth, compensation expenses, depreciation, energy, and other equipment costs) as well as other operations costs (such as content review as well as customer and product support costs).
 - Inventory and other costs related to the hardware we sell.

Software Development Costs

We expense software development costs, including costs to develop software products or the software component of products to be sold, leased, or marketed to external users, before technological feasibility is reached. Technological feasibility is typically reached shortly before the release of such products. As a result, development costs that meet the criteria for capitalization were not material for the periods presented.

Software development costs also include costs to develop software to be used solely to meet internal needs and cloud based applications used to deliver our services. We capitalize development costs related to these software applications once the preliminary project stage is complete and it is probable that the project will be completed and the software will be used to perform the function intended. Costs capitalized for developing such software applications were not material for the periods presented.

Stock-based Compensation

Stock-based compensation primarily consists of Alphabet restricted stock units (RSUs). RSUs are equity classified and measured at the fair market value of the underlying stock at the grant date. We recognize RSU expense using the straight-line attribution method over the requisite service period and account for forfeitures as they occur.

For RSUs, shares are issued on the vesting dates net of the applicable statutory income tax withholding to be paid by us on behalf of our employees. As a result, fewer shares are issued than the number of RSUs outstanding, and the income tax withholding is recorded as a reduction to additional paid-in capital.

Additionally, stock-based compensation also includes other stock-based awards, such as performance stock units (PSUs) that include market conditions and awards that may be settled in cash or the stock of certain Other Bets. PSUs and certain Other Bet awards are equity classified and expense is recognized over the requisite service period. Certain Other Bet awards are liability classified and remeasured at fair value through settlement. The fair value of Other Bet awards is based on the equity valuation of the respective Other Bet.

Advertising and Promotional Expenses

We expense advertising and promotional costs in the period in which they are incurred. For the years ended December 31, 2019, 2020 and 2021, advertising and promotional expenses totaled approximately \$6.8 billion, \$5.4 billion, and \$7.9 billion, respectively.

Performance Fees

Performance fees refer to compensation arrangements with payouts based on realized returns from certain investments. We recognize compensation expense based on the estimated payouts, which may result in expense recognized before investment returns are realized, and may require the use of unobservable inputs. Performance fees are recorded as a component of other income (expense), net.

Fair Value Measurements

Fair value is an exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As such, fair value is a market-based measurement that is determined based on assumptions that market participants would use in pricing an asset or a liability. Assets and liabilities recorded at fair value are measured and classified in accordance with a three-tier fair value hierarchy based on the observability of the inputs available in the market used to measure fair value:

Level 1 - Observable inputs that reflect quoted prices (unadjusted) for identical assets or liabilities in active markets.

Level 2 - Inputs that are based upon quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, and model-based valuation techniques for which all significant inputs are observable in the market or can be derived from observable market data. Where applicable, these models project future cash flows and discount the future amounts to a present value using market-based observable inputs including interest rate curves, foreign exchange rates, and credit ratings.

Level 3 - Unobservable inputs that are supported by little or no market activities.

The fair value hierarchy requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value.

Our financial assets and liabilities that are measured at fair value on a recurring basis include cash equivalents, marketable securities, derivative financial instruments, and certain non-marketable debt securities. Our financial assets measured at fair value on a nonrecurring basis include non-marketable equity securities. Other financial assets and liabilities are carried at cost with fair value disclosed, if required.

We measure certain other instruments, including stock-based compensation awards settled in the stock of certain Other Bets, and certain assets and liabilities acquired in a business combination, also at fair value on a nonrecurring basis. The determination of fair value involves the use of appropriate valuation methods and relevant inputs into valuation models.

Financial Instruments

Our financial instruments include cash, cash equivalents, marketable and non-marketable securities, derivative financial instruments and accounts receivable.

CREDIT RISKS

We are subject to credit risk from cash equivalents, marketable securities, derivative financial instruments, including foreign exchange contracts, and accounts receivable. We manage our credit risk exposure through timely assessment of our counterparty creditworthiness, credit limits and use of collateral management. Foreign exchange contracts are transacted with various financial institutions with high credit standing. Accounts receivable are typically unsecured and are derived from revenues earned from customers located around the world. We manage our credit risk exposure by performing ongoing evaluations to determine customer credit and we limit the amount of credit we extend. We generally do not require collateral from our customers.

CASH EQUIVALENTS

We invest excess cash primarily in government bonds, corporate debt securities, mortgage-backed and asset-backed securities, time deposits, and money market funds.

MARKETABLE SECURITIES

We classify all marketable debt securities that have stated maturities of three months or less from the date of purchase as cash equivalents and those with stated maturities of greater than three months as marketable securities on our Consolidated Balance Sheets. We determine the appropriate classification of our investments in marketable debt securities at the time of purchase and reevaluate such designation at each balance sheet date. We have classified and accounted for our marketable debt securities as available-for-sale. After consideration of our risk versus reward objectives, as well as our liquidity requirements, we may sell these debt securities prior to their stated maturities. As we view these securities as available to support current operations, we classify highly liquid securities with maturities beyond 12 months as current assets under the caption marketable securities on the Consolidated Balance Sheets. We carry these securities at fair value, and report the unrealized gains and losses, net of taxes, as a component of stockholders' equity, except for the changes in allowance for expected credit losses, which are recorded in other income (expense), net. For certain marketable debt securities we have elected the fair value option, for which changes in fair value are recorded in other income (expense), net. We determine any realized gains or losses on the sale of marketable debt securities on a specific identification method, and we record such gains and losses as a component of other income (expense), net.

Our investments in marketable equity securities are measured at fair value with the related gains and losses, including unrealized, recognized in other income (expense), net. We classify our marketable equity securities subject to long-term lock-up restrictions beyond twelve months as other non-current assets on the Consolidated Balance Sheets.

NON-MARKETABLE SECURITIES

We account for non-marketable equity securities through which we exercise significant influence but do not have control over the investee under the equity method. Our non-marketable equity securities not accounted for under the equity method are primarily accounted for under the measurement alternative. Under the measurement alternative, the carrying value is measured at cost, less any impairment, plus or minus changes resulting from observable price changes in orderly transactions for identical or similar investments of the same issuer. Adjustments are determined primarily based on a market approach as of the transaction date and are recorded as a component of other income (expense), net.

Non-marketable debt securities are classified as available-for-sale securities.

Non-marketable securities that do not have stated contractual maturity dates are classified as other non-current assets on the Consolidated Balance Sheets.

DERIVATIVE FINANCIAL INSTRUMENTS

See Note 3 for the accounting policy pertaining to derivative financial instruments.

ACCOUNTS RECEIVABLE

Our payment terms for accounts receivable vary by the types and locations of our customers and the products or services offered. The term between invoicing and when payment is due is not significant. For certain products or services and customers, we require payment before the products or services are delivered to the customer.

We maintain an allowance for credit losses for accounts receivable, which is recorded as an offset to accounts receivable, and changes in such are classified as general and administrative expense in the Consolidated Statements of Income. We assess collectibility by reviewing accounts receivable on a collective basis where similar characteristics exist and on an individual basis when we identify specific customers with known disputes or collectibility issues. In determining the amount of the allowance for credit losses, we consider historical collectibility based on past due status and make judgments about the creditworthiness of customers based on ongoing credit evaluations. We also consider customer-specific information, current market conditions (such as the effects caused by COVID-19), and reasonable and supportable forecasts of future economic conditions.

The allowance for credit losses on accounts receivable was \$789 million and \$550 million as of December 31, 2020 and 2021, respectively.

OTHER

Our financial instruments also include debt and equity investments in companies with which we also have commercial arrangements. For these transactions, judgment is required to assess the substance of the arrangements, such as the market value of similar transactions or the fair value of the investment based on stand-alone transactions, and whether the agreements should be accounted for as separate transactions under the applicable GAAP.

IMPAIRMENT OF INVESTMENTS

We periodically review our debt and non-marketable equity securities for impairment.

For debt securities in an unrealized loss position, we determine whether a credit loss exists. The credit loss is estimated by considering available information relevant to the collectibility of the security and information about past events, current conditions, and reasonable and supportable forecasts. Any credit loss is recorded as a charge to other income (expense), net, not to exceed the amount of the unrealized loss. Unrealized losses other than the credit loss are recognized in accumulated other comprehensive income (AOCI). If we have an intent to sell, or if it is more likely than not that we will be required to sell a debt security in an unrealized loss position before recovery of its amortized cost basis, we will write down the security to its fair value and record the corresponding charge as a component of other income (expense), net.

For non-marketable equity securities, including equity method investments, we consider whether impairment indicators exist by evaluating the companies' financial and liquidity position and access to capital resources, among other indicators. If the assessment indicates that the investment is impaired, we write down the investment to its fair value by recording the corresponding charge as a component of other income (expense), net. We prepare quantitative measurements of the fair value of our equity investments using a market approach or an income approach.

Inventory

Inventory consists primarily of finished goods and is stated at the lower of cost and net realizable value. Cost is computed using the first-in, first-out method.

Variable Interest Entities

We determine at the inception of each arrangement whether an entity in which we have made an investment or in which we have other variable interests is considered a variable interest entity (VIE). We consolidate VIEs when we are the primary beneficiary. We are the primary beneficiary of a VIE when we have the power to direct activities that most significantly affect the economic performance of the VIE and have the obligation to absorb the majority of their losses or benefits. If we are not the primary beneficiary in a VIE, we account for the investment or other variable interests in a VIE in accordance with applicable GAAP.

Periodically, we assess whether any changes in our interest or relationship with the entity affect our determination of whether the entity is a VIE and, if so, whether we are the primary beneficiary.

Property and Equipment

Property and equipment includes the following categories: land and buildings, information technology assets, construction in progress, leasehold improvements, and furniture and fixtures. Land and buildings include land, offices, data centers, and related building improvements. Information technology assets include servers and network equipment. We account for property and equipment at

cost less accumulated depreciation. We compute depreciation using the straight-line method over the estimated useful lives of the assets, which we regularly evaluate. We depreciate buildings over periods of seven to 25 years. We depreciate information technology assets generally over periods of four to five years (generally, four years for servers and five years for network equipment).

We depreciate leasehold improvements over the shorter of the remaining lease term or the estimated useful lives of the assets. Construction in progress is the construction or development of property and equipment that have not yet been placed in service for our intended use. Depreciation for equipment, buildings, and leasehold improvements commences once they are ready for our intended use. Land is not depreciated.

Leases

We determine if an arrangement is a lease at inception. Our lease agreements generally contain lease and non-lease components. Payments under our lease arrangements are primarily fixed. Non-lease components primarily include payments for maintenance and utilities. We combine fixed payments for non-lease components with lease payments and account for them together as a single lease component which increases the amount of our lease assets and liabilities.

Certain lease agreements contain variable payments, which are expensed as incurred and not included in the lease assets and liabilities. These amounts include payments affected by the Consumer Price Index, payments contingent on wind or solar production for power purchase arrangements, and payments for maintenance and utilities.

Lease assets and liabilities are recognized at the present value of the future lease payments at the lease commencement date. The interest rate used to determine the present value of the future lease payments is our incremental borrowing rate, because the interest rate implicit in our leases is not readily determinable. Our incremental borrowing rate is estimated to approximate the interest rate on a collateralized basis with similar terms and payments, and in economic environments where the leased asset is located. Our lease terms include periods under options to extend or terminate the lease when it is reasonably certain that we will exercise that option. We generally use the base, non-cancelable, lease term when determining the lease assets and liabilities. Lease assets also include any prepaid lease payments and lease incentives.

Operating lease assets and liabilities are included on our Consolidated Balance Sheet. The current portion of our operating lease liabilities is included in accrued expenses and other current liabilities, and the long-term portion is included in operating lease liabilities. Finance lease assets are included in property and equipment, net. Finance lease liabilities are included in accrued expenses and other current liabilities or long-term debt.

Operating lease expense (excluding variable lease costs) is recognized on a straight-line basis over the lease term.

Long-Lived Assets, Goodwill and Other Acquired Intangible Assets

We review property and equipment and intangible assets, excluding goodwill, for impairment when events or changes in circumstances indicate the carrying amount may not be recoverable. The evaluation is performed at the lowest level of identifiable cash flows independent of other assets. We measure recoverability of these assets by comparing the carrying amounts to the future undiscounted cash flows that the assets or the asset group are expected to generate. If the carrying value of the assets or asset group is not recoverable, the impairment recognized is measured as the amount by which the carrying value exceeds its fair value. Impairments were not material for the periods presented.

We allocate goodwill to reporting units based on the expected benefit from the business combination. We evaluate our reporting units periodically, as well as when changes in our operating segments occur. For changes in reporting units, we reassign goodwill using a relative fair value allocation approach. We test our goodwill for impairment at least annually, or more frequently if events or changes in circumstances indicate that the asset may be impaired. Goodwill impairments were not material for the periods presented.

Intangible assets with definite lives are amortized over their estimated useful lives on a straight-line basis generally over periods ranging from one to twelve years.

Income Taxes

We account for income taxes using the asset and liability method, under which we recognize the amount of taxes payable or refundable for the current year and deferred tax assets and liabilities for the future tax consequences of events that have been recognized in our financial statements or tax returns. We measure current and deferred tax assets and liabilities based on provisions of enacted tax law. We evaluate the realization of our deferred tax assets based on all available evidence and establish a valuation allowance to reduce deferred tax assets when it is more likely than not that they will not be realized.

We recognize the financial statement effects of a tax position when it is more likely than not that, based on technical merits, the position will be sustained upon examination. The tax benefits of the position recognized in the financial statements are then measured based on the largest amount of benefit that is greater than 50% likely to be realized upon settlement with a taxing authority. In addition, we recognize interest and penalties related to unrecognized tax benefits as a component of the income tax provision.

Business Combinations

We include the results of operations of the businesses that we acquire as of the acquisition date. We allocate the purchase price of the acquisitions to the assets acquired and liabilities assumed based on their estimated fair values. The excess of the purchase price over the fair values of identifiable assets and liabilities is recorded as goodwill. Acquisition-related expenses are recognized separately from the business combination and are expensed as incurred.

Foreign Currency

We translate the financial statements of our international subsidiaries to U.S. dollars using month-end exchange rates for assets and liabilities, and average rates for the annual period derived from month-end exchange rates for revenues, costs, and expenses. We record translation gains and losses in AOCI as a component of stockholders' equity. We reflect net foreign exchange transaction gains and losses resulting from the conversion of the transaction currency to functional currency as a component of foreign currency exchange gain (loss) in other income (expense), net.

Prior Period Reclassifications

Certain amounts in prior periods have been reclassified to conform with current period presentation.

Note 2. Revenues

Revenue Recognition

The following table presents revenues disaggregated by type (in millions):

	Year Ended December 31,		
	2019	2020	2021
Google Search & other	\$ 98,115	\$ 104,062	\$ 148,951
YouTube ads	15,149	19,772	28,845
Google Network	21,547	23,090	31,701
Google advertising	134,811	146,924	209,497
Google other	17,014	21,711	28,032
Google Services total	151,825	168,635	237,529
Google Cloud	8,918	13,059	19,206
Other Bets	659	657	753
Hedging gains (losses)	455	176	149
Total revenues	\$ 161,857	\$ 182,527	\$ 257,637

No individual customer or groups of affiliated customers represented more than 10% of our revenues in 2019, 2020, or 2021.

The following table presents revenues disaggregated by geography, based on the addresses of our customers (in millions):

	Year Ended December 31,							
	2019		2020		2021			
United States	\$ 74,843	46%	\$ 85,014	47%	\$ 117,854	46%		
EMEA ⁽¹⁾	50,645	31	55,370	30	79,107	31		
APAC ⁽¹⁾	26,928	17	32,550	18	46,123	18		
Other Americas ⁽¹⁾	8,986	6	9,417	5	14,404	5		
Hedging gains (losses)	455	0	176	0	149	0		
Total revenues	\$ 161,857	100%	\$ 182,527	100%	\$ 257,637	100%		

(1) Regions represent Europe, the Middle East, and Africa (EMEA); Asia-Pacific (APAC); and Canada and Latin America ("Other Americas").

Revenue Backlog and Deferred Revenues

As of December 31, 2021 we had \$51.0 billion of remaining performance obligations ("revenue backlog"), primarily related to Google Cloud, and expect to recognize approximately half of this amount as revenues over the next 24 months with the remaining thereafter. Our revenue backlog represents commitments in customer contracts for future services that have not yet been recognized as revenues. The amount and timing of revenue recognition for these commitments is largely driven by when our customers utilize services and our ability to deliver in accordance with relevant contract terms, which could affect our estimate of revenue backlog and when we expect to recognize such as revenues. Revenue backlog includes related deferred revenue currently recorded as well as amounts that will be invoiced in future periods, and excludes contracts with an original expected term of one year or less and cancellable contracts.

We record deferred revenues when cash payments are received or due in advance of our performance, including amounts which are refundable. Deferred revenues primarily relate to Google Cloud and Google other. Total deferred revenue as of December 31, 2020 was \$3.0 billion, of which \$2.3 billion was recognized as revenues for the year ending December 31, 2021.

Note 3. Financial Instruments

Debt Securities

We classify our marketable debt securities, which are accounted for as available-for-sale within Level 2 in the fair value hierarchy, because we use quoted market prices to the extent available or alternative pricing sources and models utilizing market observable inputs to determine fair value.

For certain marketable debt securities, we have elected the fair value option for which changes in fair value are recorded in other income (expense), net. The fair value option was elected for these securities to align with the unrealized gains and losses from related derivative contracts. Unrealized net gains (losses) related to debt securities still held where we have elected the fair value option were \$87 million and \$(35) million as of December 31, 2020 and December 31, 2021, respectively. As of December 31, 2020 and December 31, 2021, the fair value of these debt securities was \$2.0 billion and \$4.7 billion, respectively.

The following tables summarize debt securities, for which we did not elect the fair value option, by significant investment categories as of December 31, 2020 and 2021 (in millions):

	As of December 31, 2020					
	Adjusted Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value	Cash and Cash Equivalents	Marketable Securities
Level 2:						
Time deposits ⁽¹⁾	\$ 3,564	\$ 0	\$ 0	\$ 3,564	\$ 3,564	\$ 0
Government bonds	55,156	793	(9)	55,940	2,527	53,413
Corporate debt securities	31,521	704	(2)	32,223	8	32,215
Mortgage-backed and asset-backed securities	16,767	364	(7)	17,124	0	17,124
Total	\$ 107,008	\$ 1,861	\$ (18)	\$ 108,851	\$ 6,099	\$ 102,752

	As of December 31, 2021					
	Adjusted Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value	Cash and Cash Equivalents	Marketable Securities
Level 2:						
Time deposits ⁽¹⁾	\$ 5,133	\$ 0	\$ 0	\$ 5,133	\$ 5,133	\$ 0
Government bonds	53,288	258	(238)	53,308	5	53,303
Corporate debt securities	35,605	194	(223)	35,576	12	35,564
Mortgage-backed and asset-backed securities	18,829	96	(112)	18,813	0	18,813
Total	\$ 112,855	\$ 548	\$ (573)	\$ 112,830	\$ 5,150	\$ 107,680

(1) The majority of our time deposits are domestic deposits.

We determine realized gains or losses on the sale or extinguishment of debt securities on a specific identification method. We recognized gross realized gains of \$292 million, \$899 million, and \$432 million for the years ended December 31, 2019, 2020, and 2021, respectively. We recognized gross realized losses of \$143 million, \$184 million, and \$329 million for the years ended December 31, 2019, 2020, and 2021, respectively. We reflect these gains and losses as a component of other income (expense), net.

The following table summarizes the estimated fair value of investments in marketable debt securities by stated contractual maturity dates (in millions):

	As of December 31, 2021
Due in 1 year or less	\$ 16,192
Due in 1 year through 5 years	78,625
Due in 5 years through 10 years	4,675
Due after 10 years	12,864
Total	<u>\$ 112,356</u>

The following tables present fair values and gross unrealized losses recorded to AOCI as of December 31, 2020 and 2021, aggregated by investment category and the length of time that individual securities have been in a continuous loss position (in millions):

	As of December 31, 2020					
	Less than 12 Months		12 Months or Greater		Total	
	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
Government bonds	\$ 5,516	\$ (9)	\$ 3	\$ 0	\$ 5,519	\$ (9)
Corporate debt securities	1,999	(1)	0	0	1,999	(1)
Mortgage-backed and asset-backed securities	929	(5)	242	(2)	1,171	(7)
Total	<u>\$ 8,444</u>	<u>\$ (15)</u>	<u>\$ 245</u>	<u>\$ (2)</u>	<u>\$ 8,689</u>	<u>\$ (17)</u>

	As of December 31, 2021					
	Less than 12 Months		12 Months or Greater		Total	
	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
Government bonds	\$ 32,843	\$ (236)	\$ 71	\$ (2)	\$ 32,914	\$ (238)
Corporate debt securities	22,737	(152)	303	(5)	23,040	(157)
Mortgage-backed and asset-backed securities	11,502	(106)	248	(6)	11,750	(112)
Total	<u>\$ 67,082</u>	<u>\$ (494)</u>	<u>\$ 622</u>	<u>\$ (13)</u>	<u>\$ 67,704</u>	<u>\$ (507)</u>

During the years ended December 31, 2020 and 2021, we did not recognize significant credit losses and the ending allowance for credit losses was immaterial. See Note 7 for further details on other income (expense), net.

Equity Investments

The following discusses our marketable equity securities, non-marketable equity securities, gains and losses on marketable and non-marketable equity securities, as well as our equity securities accounted for under the equity method.

Our marketable equity securities are publicly traded stocks or funds measured at fair value and classified within Level 1 and 2 in the fair value hierarchy because we use quoted prices for identical assets in active markets or inputs that are based upon quoted prices for similar instruments in active markets.

Our non-marketable equity securities are investments in privately held companies without readily determinable market values. The carrying value of our non-marketable equity securities is adjusted to fair value upon observable transactions for identical or similar investments of the same issuer or impairment (referred to as the measurement alternative). Non-marketable equity securities that have been remeasured during the period based on observable transactions are classified within Level 2 or Level 3 in the fair value hierarchy because we estimate the value based on valuation methods which may include a combination of the observable transaction price at the transaction date and other unobservable inputs including volatility, rights, and obligations of the securities we hold. The fair value of non-marketable equity securities that have been remeasured due to impairment are classified within Level 3.

GAINS AND LOSSES ON MARKETABLE AND NON-MARKETABLE EQUITY SECURITIES

Gains and losses reflected in other income (expense), net, for marketable and non-marketable equity securities are summarized below (in millions):

	Year Ended December 31,	
	2020	2021
Net gain (loss) on equity securities sold during the period	\$ 1,339	\$ 1,196
Unrealized gain (loss) on equity securities held as of the end of the period	4,253	11,184
Total gain (loss) recognized in other income (expense), net	\$ 5,592	\$ 12,380

In the table above, net gain (loss) on equity securities sold during the period reflects the difference between the sale proceeds and the carrying value of the equity securities at the beginning of the period or the purchase date, if later.

Cumulative net gains (losses) on equity securities sold during the period, which is summarized in the following table (in millions), represents the total net gains (losses) recognized after the initial purchase date of the equity security. While these net gains may have been reflected in periods prior to the period of sale, we believe they are important supplemental information as they reflect the economic net gains recognized on the securities sold during the period. Cumulative net gains are calculated as the difference between the sale price and the initial purchase price for the equity security sold during the period.

	Equity Securities Sold During the Year Ended December 31,	
	2020	2021
Total sale price	\$ 4,767	\$ 5,604
Total initial cost	2,674	1,206
Cumulative net gains ⁽¹⁾	\$ 2,093	\$ 4,398

(1) Cumulative net gains excludes cumulative losses of \$738 million resulting from our equity derivatives, which hedged the changes in fair value of certain marketable equity securities sold during the year ended December 31, 2021. The associated derivative liabilities arising from these losses were settled against our holdings of the underlying equity securities.

CARRYING VALUE OF MARKETABLE AND NON-MARKETABLE EQUITY SECURITIES

The carrying value is measured as the total initial cost plus the cumulative net gain (loss). The carrying values for marketable and non-marketable equity securities are summarized below (in millions):

	As of December 31, 2020		
	Marketable Equity Securities	Non-Marketable Equity Securities	Total
Total initial cost	\$ 2,227	\$ 14,616	\$ 16,843
Cumulative net gain (loss) ⁽¹⁾	3,631	4,277	7,908
Carrying value ⁽²⁾	\$ 5,858	\$ 18,893	\$ 24,751

(1) Non-marketable equity securities cumulative net gain (loss) is comprised of \$6.1 billion gains and \$1.9 billion losses (including impairment).

(2) The long-term portion of marketable equity securities (subject to long-term lock-up restrictions) of \$429 million is included within other non-current assets.

	As of December 31, 2021		
	Marketable Equity Securities	Non-Marketable Equity Securities	Total
Total initial cost	\$ 4,211	\$ 15,135	\$ 19,346
Cumulative net gain (loss) ⁽¹⁾	3,587	12,436	16,023
Carrying value ⁽²⁾	\$ 7,798	\$ 27,571	\$ 35,369

(1) Non-marketable equity securities cumulative net gain (loss) is comprised of \$14.1 billion gains and \$1.7 billion losses (including impairment).

(2) The long-term portion of marketable equity securities (subject to long-term lock-up restrictions) of \$1.4 billion is included within other non-current assets.

MARKETABLE EQUITY SECURITIES

The following table summarizes marketable equity securities measured at fair value by significant investment categories as of December 31, 2020 and 2021 (in millions):

	As of December 31, 2020		As of December 31, 2021	
	Cash and Cash Equivalents	Marketable Equity Securities	Cash and Cash Equivalents	Marketable Equity Securities
Level 1:				
Money market funds	\$ 12,210	\$ 0	\$ 7,499	\$ 0
Marketable equity securities ⁽¹⁾⁽²⁾	0	5,470	0	7,447
	12,210	5,470	7,499	7,447
Level 2:				
Mutual funds	0	388	0	351
Total	\$ 12,210	\$ 5,858	\$ 7,499	\$ 7,798

(1) The balance as of December 31, 2020 and 2021 includes investments that were reclassified from non-marketable equity securities following the commencement of public market trading of the issuers or acquisition by public entities (certain investments are subject to short-term lock-up restrictions).

(2) As of December 31, 2020 and 2021, the long-term portion of marketable equity securities (subject to long-term lock-up restrictions) of \$429 million and \$1.4 billion, respectively, is included within other non-current assets.

NON-MARKETABLE EQUITY SECURITIES

The following is a summary of unrealized gains and losses recorded in other income (expense), net, which are included as adjustments to the carrying value of non-marketable equity securities held as of the end of the period (in millions):

	Year Ended December 31,	
	2020	2021
Unrealized gains on non-marketable equity securities	\$ 3,020	\$ 9,971
Unrealized losses on non-marketable equity securities (including impairment)	(1,489)	(122)
Total unrealized gain (loss) recognized on non-marketable equity securities	\$ 1,531	\$ 9,849

During the year ended December 31, 2021, included in the \$27.6 billion of non-marketable equity securities held as of the end of the period, \$18.6 billion were measured at fair value resulting in a net unrealized gain of \$9.8 billion.

EQUITY SECURITIES ACCOUNTED FOR UNDER THE EQUITY METHOD

As of December 31, 2020 and 2021, equity securities accounted for under the equity method had a carrying value of approximately \$1.4 billion and \$1.5 billion, respectively. Our share of gains and losses, including impairments, are included as a component of other income (expense), net, in the Consolidated Statements of Income. See Note 7 for further details on other income (expense), net.

Derivative Financial Instruments

We enter into derivative instruments to manage risks relating to our ongoing business operations. The primary risk managed with derivative instruments is foreign exchange risk. We use foreign currency contracts to reduce the risk that our cash flows, earnings, and investment in foreign subsidiaries will be adversely affected by foreign currency exchange rate fluctuations. We also enter into derivative instruments to partially offset our exposure to other risks and enhance investment returns.

We recognize derivative instruments as either assets or liabilities in the Consolidated Balance Sheets at fair value and classify the derivatives primarily within Level 2 in the fair value hierarchy. We present our collar contracts (an option strategy comprised of a combination of purchased and written options) at net fair values where both the purchased and written options are with the same counterparty. For other derivative contracts, we present at gross fair values. We primarily record changes in the fair value in the Consolidated Statements of Income as either other income (expense), net, or revenues, or in the Consolidated Balance Sheets in AOCI, as discussed below.

We enter into master netting arrangements, which reduce credit risk by permitting net settlement of transactions with the same counterparty. Further, we enter into collateral security arrangements that provide for collateral to be received or pledged when the net fair value of certain financial instruments fluctuates from contractually established thresholds. Cash collateral received related to derivative instruments under our collateral security arrangements are included in other current assets with a corresponding liability. Cash and non-cash collateral pledged related to derivative instruments under our collateral security arrangements are included in other current assets.

CASH FLOW HEDGES

We designate foreign currency forward and option contracts (including collars) as cash flow hedges to hedge certain forecasted revenue transactions denominated in currencies other than the U.S. dollar. These contracts have maturities of 24 months or less.

Cash flow hedge amounts included in the assessment of hedge effectiveness are deferred in AOCI and subsequently reclassified to revenue when the hedged item is recognized in earnings. We exclude the change in forward points and time value from our assessment of hedge effectiveness. The initial value of the excluded component is amortized on a straight-line basis over the life of the hedging instrument and recognized in revenues. The difference between fair value changes of the excluded component and the amount amortized to revenues is recorded in AOCI. If the hedged transactions become probable of not occurring, the corresponding amounts in AOCI are reclassified to other income (expense), net in the period of de-designation.

As of December 31, 2021, the net accumulated gain on our foreign currency cash flow hedges before tax effect was \$518 million, which is expected to be reclassified from AOCI into earnings within the next 12 months.

FAIR VALUE HEDGES

We designate foreign currency forward contracts as fair value hedges to hedge foreign currency risks for our investments denominated in currencies other than the U.S. dollar. Fair value hedge amounts included in the assessment of hedge effectiveness are recognized in other income (expense), net, along with the offsetting gains and losses of the related hedged items. We exclude changes in forward points from the assessment of hedge effectiveness and recognize changes in the excluded component in other income (expense), net.

NET INVESTMENT HEDGES

We designate foreign currency forward contracts as net investment hedges to hedge the foreign currency risks related to our investment in foreign subsidiaries. Net investment hedge amounts included in the assessment of hedge effectiveness are recognized in AOCI along with the foreign currency translation adjustment. We exclude changes in forward points from the assessment of hedge effectiveness and recognize changes in the excluded component in other income (expense), net.

OTHER DERIVATIVES

Other derivatives not designated as hedging instruments consist primarily of foreign currency forward contracts that we use to hedge intercompany transactions and other monetary assets or liabilities denominated in currencies other than the functional currency of a subsidiary. Gains and losses on these contracts, as well as the related costs, are recognized in other income (expense), net, along with the foreign currency gains and losses on monetary assets and liabilities.

We also use derivatives not designated as hedging instruments to manage risks relating to interest rates, commodity prices, credit exposures and to enhance investment returns. Additionally, from time to time, we enter into derivatives to hedge the market price risk on certain of our marketable equity securities. Gains (losses) arising from these derivatives are reflected within the "other" component of other income (expense), net and the offsetting recognized gains (losses) on the marketable equity securities are reflected within the gain (loss) on equity securities, net component of other income (expense), net. See Note 7 for further details on other income (expense), net.

The gross notional amounts of outstanding derivative instruments were as follows (in millions):

	As of December 31,	
	2020	2021
Derivatives Designated as Hedging Instruments:		
Foreign exchange contracts		
Cash flow hedges	\$ 10,187	\$ 16,362
Fair value hedges	\$ 1,569	\$ 2,556
Net investment hedges	\$ 9,965	\$ 10,159
Derivatives Not Designated as Hedging Instruments:		
Foreign exchange contracts		
	\$ 39,861	\$ 41,031
Other contracts	\$ 2,399	\$ 4,275

The fair values of outstanding derivative instruments were as follows (in millions):

		As of December 31, 2020		
Balance Sheet Location		Fair Value of Derivatives Designated as Hedging Instruments	Fair Value of Derivatives Not Designated as Hedging Instruments	Total Fair Value
Derivative Assets:				
Level 2:				
Foreign exchange contracts	Other current and non-current assets	\$ 33	\$ 316	\$ 349
Other contracts	Other current and non-current assets	0	16	16
Total		\$ 33	\$ 332	\$ 365
Derivative Liabilities:				
Level 2:				
Foreign exchange contracts	Accrued expenses and other liabilities, current and non-current	\$ 395	\$ 185	\$ 580
Other contracts	Accrued expenses and other liabilities, current and non-current	0	942	942
Total		\$ 395	\$ 1,127	\$ 1,522

		As of December 31, 2021		
Balance Sheet Location		Fair Value of Derivatives Designated as Hedging Instruments	Fair Value of Derivatives Not Designated as Hedging Instruments	Total Fair Value
Derivative Assets:				
Level 2:				
Foreign exchange contracts	Other current and non-current assets	\$ 867	\$ 42	\$ 909
Other contracts	Other current and non-current assets	0	52	52
Total		\$ 867	\$ 94	\$ 961
Derivative Liabilities:				
Level 2:				
Foreign exchange contracts	Accrued expenses and other liabilities, current and non-current	\$ 8	\$ 452	\$ 460
Other contracts	Accrued expenses and other liabilities, current and non-current	0	121	121
Total		\$ 8	\$ 573	\$ 581

The gains (losses) on derivatives in cash flow hedging and net investment hedging relationships recognized in other comprehensive income (OCI) were summarized below (in millions):

		Gains (Losses) Recognized in OCI on Derivatives Before Tax Effect		
		Year Ended December 31,		
		2019	2020	2021
Derivatives in Cash Flow Hedging Relationship:				
Foreign exchange contracts				
Amount included in the assessment of effectiveness		\$ 38	\$ 102	\$ 806
Amount excluded from the assessment of effectiveness		(14)	(37)	48
Derivatives in Net Investment Hedging Relationship:				
Foreign exchange contracts				
Amount included in the assessment of effectiveness		131	(851)	754
Total		\$ 155	\$ (786)	\$ 1,608

The effect of derivative instruments on income was summarized below (in millions):

	Gains (Losses) Recognized in Income					
	Year Ended December 31,					
	2019		2020		2021	
	Revenues	Other income (expense), net	Revenues	Other income (expense), net	Revenues	Other income (expense), net
Total amounts presented in the Consolidated Statements of Income in which the effects of cash flow and fair value hedges are recorded	\$ 161,857	\$ 5,394	\$ 182,527	\$ 6,858	\$ 257,637	\$ 12,020
Gains (Losses) on Derivatives in Cash Flow Hedging Relationship:						
Foreign exchange contracts						
Amount of gains (losses) reclassified from AOCI to income	\$ 367	\$ 0	\$ 144	\$ 0	\$ 165	\$ 0
Amount excluded from the assessment of effectiveness recognized in earnings based on an amortization approach	88	0	33	0	(16)	0
Gains (Losses) on Derivatives in Fair Value Hedging Relationship:						
Foreign exchange contracts						
Hedged items	0	(19)	0	18	0	(95)
Derivatives designated as hedging instruments	0	19	0	(18)	0	95
Amount excluded from the assessment of effectiveness	0	25	0	4	0	8
Gains (Losses) on Derivatives in Net Investment Hedging Relationship:						
Foreign exchange contracts						
Amount excluded from the assessment of effectiveness	0	243	0	151	0	82
Gains (Losses) on Derivatives Not Designated as Hedging Instruments:						
Foreign exchange contracts	0	(413)	0	718	0	(860)
Other Contracts	0	0	0	(906)	0	101
Total gains (losses)	\$ 455	\$ (145)	\$ 177	\$ (33)	\$ 149	\$ (669)

Offsetting of Derivatives

The gross amounts of derivative instruments subject to master netting arrangements with various counterparties, and cash and non-cash collateral received and pledged under such agreements were as follows (in millions):

OFFSETTING OF ASSETS

As of December 31, 2020							
Derivatives	Gross Amounts of Recognized Assets	Gross Amounts Offset in the Consolidated Balance Sheets	Net Presented in the Consolidated Balance Sheets	Gross Amounts Not Offset in the Consolidated Balance Sheets, but Have Legal Rights to Offset			Net Assets Exposed
				Financial Instruments	Cash Collateral Received	Non-Cash Collateral Received	
Derivatives	\$ 397	\$ (32)	\$ 365	\$ (295) ⁽¹⁾	\$ (16)	\$ 0	\$ 54

As of December 31, 2021							
Derivatives	Gross Amounts of Recognized Assets	Gross Amounts Offset in the Consolidated Balance Sheets	Net Presented in the Consolidated Balance Sheets	Gross Amounts Not Offset in the Consolidated Balance Sheets, but Have Legal Rights to Offset			Net Assets Exposed
				Financial Instruments	Cash Collateral Received	Non-Cash Collateral Received	
Derivatives	\$ 999	\$ (38)	\$ 961	\$ (434) ⁽¹⁾	\$ (394)	\$ (12)	\$ 121

(1) The balances as of December 31, 2020 and 2021 were related to derivative liabilities which are allowed to be net settled against derivative assets in accordance with our master netting agreements.

OFFSETTING OF LIABILITIES

As of December 31, 2020							
Derivatives	Gross Amounts of Recognized Liabilities	Gross Amounts Offset in the Consolidated Balance Sheets	Net Presented in the Consolidated Balance Sheets	Gross Amounts Not Offset in the Consolidated Balance Sheets, but Have Legal Rights to Offset			Net Liabilities
				Financial Instruments	Cash Collateral Pledged	Non-Cash Collateral Pledged	
Derivatives	\$ 1,554	\$ (32)	\$ 1,522	\$ (295) ⁽²⁾	\$ (1)	\$ (943)	\$ 283

As of December 31, 2021							
Derivatives	Gross Amounts of Recognized Liabilities	Gross Amounts Offset in the Consolidated Balance Sheets	Net Presented in the Consolidated Balance Sheets	Gross Amounts Not Offset in the Consolidated Balance Sheets, but Have Legal Rights to Offset			Net Liabilities
				Financial Instruments	Cash Collateral Pledged	Non-Cash Collateral Pledged	
Derivatives	\$ 619	\$ (38)	\$ 581	\$ (434) ⁽²⁾	\$ (4)	\$ (110)	\$ 33

(2) The balances as of December 31, 2020 and 2021 were related to derivative assets which are allowed to be net settled against derivative liabilities in accordance with our master netting agreements.

Note 4. Leases

We have entered into operating lease agreements primarily for data centers, land and offices throughout the world with lease periods expiring between 2022 and 2063.

Components of operating lease expense were as follows (in millions):

	Year Ended December 31,	
	2020	2021
Operating lease cost	\$ 2,267	\$ 2,699
Variable lease cost	619	726
Total operating lease cost	\$ 2,886	\$ 3,425

Supplemental information related to operating leases was as follows (in millions):

	Year Ended December 31,	
	2020	2021
Cash payments for operating leases	\$ 2,004	\$ 2,489
New operating lease assets obtained in exchange for operating lease liabilities	\$ 2,765	\$ 2,951

As of December 31, 2021, our operating leases had a weighted average remaining lease term of 8 years and a weighted average discount rate of 2.3%. Future lease payments under operating leases as of December 31, 2021 were as follows (in millions):

2022	\$ 2,539
2023	2,527
2024	2,226
2025	1,815
2026	1,401
Thereafter	4,948
Total future lease payments	15,456
Less imputed interest	(1,878)
Total lease liability balance	\$ 13,578

As of December 31, 2021, we have entered into leases that have not yet commenced with short-term and long-term future lease payments of \$606 million and \$5.2 billion, excluding purchase options, that are not yet recorded on our Consolidated Balance Sheets. These leases will commence between 2022 and 2026 with non-cancelable lease terms of 1 to 25 years.

Note 5. Variable Interest Entities

Consolidated VIEs

We consolidate VIEs in which we hold a variable interest and are the primary beneficiary. The results of operations and financial position of these VIEs are included in our consolidated financial statements.

For certain consolidated VIEs, their assets are not available to us and their creditors do not have recourse to us. As of December 31, 2020 and 2021, assets that can only be used to settle obligations of these VIEs were \$5.7 billion and \$6.0 billion, respectively, and the liabilities for which creditors only have recourse to the VIEs were \$2.3 billion and \$2.5 billion, respectively.

Total noncontrolling interests (NCI), including redeemable noncontrolling interests (RNCI), in our consolidated subsidiaries was \$3.9 billion and \$4.3 billion as of December 31, 2020 and 2021, respectively. NCI and RNCI are included within additional paid-in capital. Net loss attributable to noncontrolling interests was not material for any period presented and is included within the "other" component of other income (expense), net. See Note 7 for further details on other income (expense), net.

WAYMO

In June 2021, Waymo, a self-driving technology development company and a consolidated VIE, completed an investment round of \$2.5 billion, the majority of which represented investment from Alphabet. The investments from external parties were accounted for as equity transactions and resulted in recognition of noncontrolling interests.

Unconsolidated VIEs

We have investments in VIEs in which we are not the primary beneficiary. These VIEs include private companies that are primarily early stage companies and certain renewable energy entities in which activities involve power generation using renewable sources.

We have determined that the governance structures of these entities do not allow us to direct the activities that would significantly affect their economic performance. Therefore, we are not the primary beneficiary, and the results of operations and financial position of these VIEs are not included in our consolidated financial statements. We account for these investments as non-marketable equity securities or equity method investments.

The maximum exposure of these unconsolidated VIEs is generally based on the current carrying value of the investments and any future funding commitments. We have determined that the single source of our exposure to these VIEs is our capital investments in them. The carrying value, and maximum exposure of these unconsolidated VIEs were \$1.7 billion and \$1.9 billion, respectively, as of December 31, 2020 and \$2.7 billion and \$2.9 billion, respectively, as of December 31, 2021.

Note 6. Debt

Short-Term Debt

We have a debt financing program of up to \$10.0 billion through the issuance of commercial paper, which increased from \$5.0 billion in September 2021. Net proceeds from this program are used for general corporate purposes. We had no commercial paper outstanding as of December 31, 2020 and 2021.

Our short-term debt balance also includes the current portion of certain long-term debt.

Long-Term Debt

Total outstanding debt is summarized below (in millions, except percentages):

	Maturity	Coupon Rate	Effective Interest Rate	As of December 31,	
				2020	2021
Debt					
2011-2020 Notes Issuances	2024 - 2060	0.45% - 3.38%	0.57% - 3.38%	\$ 14,000	\$ 13,000
Future finance lease payments, net ⁽¹⁾				1,201	2,086
Total debt				15,201	15,086
Unamortized discount and debt issuance costs				(169)	(156)
Less: Current portion of Notes ⁽²⁾				(999)	—
Less: Current portion future finance lease payments, net ⁽¹⁾⁽²⁾				(101)	(113)
Total long-term debt				\$ 13,932	\$ 14,817

(1) Net of imputed interest.

(2) Total current portion of long-term debt is included within other accrued expenses and current liabilities. See Note 7.

The notes in the table above are comprised of fixed-rate senior unsecured obligations and generally rank equally with each other. We may redeem the notes at any time in whole or in part at specified redemption prices. The effective interest rates are based on proceeds received with interest payable semi-annually.

The total estimated fair value of the outstanding notes, including the current portion, was approximately \$14.0 billion and \$12.4 billion as of December 31, 2020 and December 31, 2021, respectively. The fair value was determined based on observable market prices of identical instruments in less active markets and is categorized accordingly as Level 2 in the fair value hierarchy.

As of December 31, 2021, the aggregate future principal payments for long-term debt, including finance lease liabilities, for each of the next five years and thereafter were as follows (in millions):

2022	\$ 187
2023	146
2024	1,159
2025	1,162
2026	2,165
Thereafter	10,621
Total	\$ 15,440

Credit Facility

As of December 31, 2021, we have \$10.0 billion of revolving credit facilities. No amounts were outstanding under the credit facilities as of December 31, 2020 and 2021.

In April 2021, we terminated the existing \$4.0 billion revolving credit facilities, which were scheduled to expire in July 2023, and entered into two new revolving credit facilities in the amounts of \$4.0 billion and \$6.0 billion, which will expire in April 2022 and April 2026, respectively. The interest rates for the new credit facilities are determined based on a formula using certain market rates, as well as our progress toward the achievement of certain sustainability goals. No amounts have been borrowed under the new credit facilities.

Note 7. Supplemental Financial Statement Information

Property and Equipment, Net

Property and equipment, net, consisted of the following (in millions):

	As of December 31,	
	2020	2021
Land and buildings	\$ 49,732	\$ 58,881
Information technology assets	45,906	55,606
Construction in progress	23,111	23,171
Leasehold improvements	7,516	9,146
Furniture and fixtures	197	208
Property and equipment, gross	126,462	147,012
Less: accumulated depreciation	(41,713)	(49,414)
Property and equipment, net	\$ 84,749	\$ 97,599

Accrued expenses and other current liabilities

Accrued expenses and other current liabilities consisted of the following (in millions):

	As of December 31,	
	2020	2021
European Commission fines ⁽¹⁾	\$ 10,409	\$ 9,799
Payables to brokers for unsettled investment trades	754	397
Accrued customer liabilities	3,118	3,505
Accrued purchases of property and equipment	2,197	2,415
Current operating lease liabilities	1,694	2,189
Other accrued expenses and current liabilities	10,459	12,931
Accrued expenses and other current liabilities	\$ 28,631	\$ 31,236

(1) Includes the effects of foreign exchange and interest. See Note 10 for further details.

Accumulated Other Comprehensive Income (Loss)

Components of AOCI, net of income tax, were as follows (in millions):

	Foreign Currency Translation Adjustments	Unrealized Gains (Losses) on Available-for-Sale Investments	Unrealized Gains (Losses) on Cash Flow Hedges	Total
Balance as of December 31, 2018	\$ (1,884)	\$ (688)	\$ 266	\$ (2,306)
Cumulative effect of accounting change	0	0	(30)	(30)
Other comprehensive income (loss) before reclassifications	(119)	1,611	36	1,528
Amounts excluded from the assessment of hedge effectiveness recorded in AOCI	0	0	(14)	(14)
Amounts reclassified from AOCI	0	(111)	(299)	(410)
Other comprehensive income (loss)	(119)	1,500	(277)	1,104
Balance as of December 31, 2019	(2,003)	812	(41)	(1,232)
Other comprehensive income (loss) before reclassifications	1,139	1,313	79	2,531
Amounts excluded from the assessment of hedge effectiveness recorded in AOCI	0	0	(37)	(37)
Amounts reclassified from AOCI	0	(513)	(116)	(629)
Other comprehensive income (loss)	1,139	800	(74)	1,865
Balance as of December 31, 2020	(864)	1,612	(115)	633
Other comprehensive income (loss) before reclassifications	(1,442)	(1,312)	668	(2,086)
Amounts excluded from the assessment of hedge effectiveness recorded in AOCI	0	0	48	48
Amounts reclassified from AOCI	0	(64)	(154)	(218)
Other comprehensive income (loss)	(1,442)	(1,376)	562	(2,256)
Balance as of December 31, 2021	\$ (2,306)	\$ 236	\$ 447	\$ (1,623)

The effects on net income of amounts reclassified from AOCI were as follows (in millions):

AOCI Components	Location	Gains (Losses) Reclassified from AOCI to the Consolidated Statements of Income		
		Year Ended December 31,		
		2019	2020	2021
Unrealized gains (losses) on available-for-sale investments				
	Other income (expense), net	\$ 149	\$ 650	\$ 82
	Benefit (provision) for income taxes	(38)	(137)	(18)
	Net of income tax	111	513	64
Unrealized gains (losses) on cash flow hedges				
Foreign exchange contracts	Revenue	367	144	165
Interest rate contracts	Other income (expense), net	6	6	6
	Benefit (provision) for income taxes	(74)	(34)	(17)
	Net of income tax	299	116	154
Total amount reclassified, net of income tax		\$ 410	\$ 629	\$ 218

Other Income (Expense), Net

Components of other income (expense), net, were as follows (in millions):

	Year Ended December 31,		
	2019	2020	2021
Interest income	\$ 2,427	\$ 1,865	\$ 1,499
Interest expense ⁽¹⁾	(100)	(135)	(346)
Foreign currency exchange gain (loss), net ⁽²⁾	103	(344)	(240)
Gain (loss) on debt securities, net	149	725	(110)
Gain (loss) on equity securities, net	2,649	5,592	12,380
Performance fees	(326)	(609)	(1,908)
Income (loss) and impairment from equity method investments, net	390	401	334
Other ⁽³⁾	102	(637)	411
Other income (expense), net	\$ 5,394	\$ 6,858	\$ 12,020

(1) Interest expense is net of interest capitalized of \$167 million, \$218 million, and \$163 million for the years ended December 31, 2019, 2020, and 2021, respectively.

(2) Our foreign currency exchange gain (loss), net, is primarily related to the forward points for our foreign currency hedging contracts and foreign exchange transaction gains and losses from the conversion of the transaction currency to the functional currency, offset by the foreign currency hedging contracts' losses and gains.

(3) During the year ended December 31, 2020, we entered into derivatives that hedged the changes in fair value of certain marketable equity securities, which resulted in losses of \$902 million and gains of \$92 million for the years ended December 31, 2020 and 2021, respectively. The offsetting recognized gains and losses on the marketable equity securities are reflected in Gain (loss) on equity securities, net.

Note 8. Acquisitions

Fitbit

In January 2021, we closed the acquisition of Fitbit, a leading wearables brand for \$2.1 billion. The addition of Fitbit to Google Services is expected to help spur innovation in wearable devices. The assets acquired and liabilities assumed were recorded at fair value. The purchase price excludes post acquisition compensation arrangements. The purchase price was attributed to \$440 million cash acquired, \$590 million of intangible assets, \$1.2 billion of goodwill and \$92 million of net liabilities assumed. Goodwill was recorded in the Google Services segment and primarily attributable to synergies expected to arise after the acquisition. Goodwill is not expected to be deductible for tax purposes.

Other Acquisitions

During the year ended December 31, 2021, we completed other acquisitions and purchases of intangible assets for total consideration of approximately \$885 million, net of cash acquired, of which the total amount of goodwill expected to be deductible for tax purposes is approximately \$118 million. Pro forma results of operations for these acquisitions have not been presented because they are not material to our consolidated results of operations, either individually or in the aggregate.

Note 9. Goodwill and Other Intangible Assets

Goodwill

Changes in the carrying amount of goodwill for the years ended December 31, 2020 and 2021 were as follows (in millions):

	Google	Google Services	Google Cloud	Other Bets	Total
Balance as of December 31, 2019	\$ 19,921	\$ 0	\$ 0	\$ 703	\$ 20,624
Acquisitions	204	53	189	0	446
Foreign currency translation and other adjustments	46	56	5	(2)	105
Allocation in the fourth quarter of 2020 ⁽¹⁾	(20,171)	18,408	1,763	0	0
Balance as of December 31, 2020	0	18,517	1,957	701	21,175
Acquisitions	0	1,325	382	103	1,810
Foreign currency translation and other adjustments	0	(16)	(2)	(11)	(29)
Balance as of December 31, 2021	\$ 0	\$ 19,826	\$ 2,337	\$ 793	\$ 22,956

(1) Represents reallocation of goodwill as a result of our change in segments in the fourth quarter of 2020. See Note 15 for further details.

Other Intangible Assets

Information regarding purchased intangible assets was as follows (in millions):

	As of December 31, 2020		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Patents and developed technology	\$ 4,639	\$ 3,649	\$ 990
Customer relationships	266	49	217
Trade names and other	624	461	163
Total definite-lived intangible assets	5,529	4,159	1,370
Indefinite-lived intangible assets	75	0	75
Total intangible assets	\$ 5,604	\$ 4,159	\$ 1,445

	As of December 31, 2021		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Value
Patents and developed technology	\$ 4,786	\$ 4,112	\$ 674
Customer relationships	506	140	366
Trade names and other	534	295	239
Total definite-lived intangible assets	5,826	4,547	1,279
Indefinite-lived intangible assets	138	0	138
Total intangible assets	\$ 5,964	\$ 4,547	\$ 1,417

Patents and developed technology, customer relationships, and trade names and other have weighted-average remaining useful lives of 0.7 years, 3.5 years, and 4.5 years, respectively.

For all intangible assets acquired and purchased during the year ended December 31, 2021, patents and developed technology have a weighted-average useful life of 4.1 years, customer relationships have a weighted-average useful life of 4.3 years, and trade names and other have a weighted-average useful life of 9.9 years.

Amortization expense relating to purchased intangible assets was \$795 million, \$774 million, and \$875 million for the years ended December 31, 2019, 2020, and 2021, respectively.

As of December 31, 2021, expected amortization expense relating to purchased intangible assets for each of the next five years and thereafter was as follows (in millions):

2022	\$	537
2023		255
2024		226
2025		98
2026		61
Thereafter		102
	\$	<u>1,279</u>

Note 10. Contingencies

Indemnifications

In the normal course of business, including to facilitate transactions in our services and products and corporate activities, we indemnify certain parties, including advertisers, Google Network partners, customers of Google Cloud offerings, lessors and service providers with respect to certain matters. We have agreed to hold certain parties harmless against losses arising from a breach of representations or covenants, or out of intellectual property infringement or other claims made against certain parties. Several of these agreements limit the time within which an indemnification claim can be made and the amount of the claim. In addition, we have entered into indemnification agreements with our officers and directors, and our bylaws contain similar indemnification obligations to our agents.

It is not possible to make a reasonable estimate of the maximum potential amount under these indemnification agreements due to the unique facts and circumstances involved in each particular agreement. Additionally, we have a limited history of prior indemnification claims, and the payments we have made under such agreements have not had a material adverse effect on our results of operations, cash flows, or financial position. However, to the extent that valid indemnification claims arise in the future, future payments by us could be significant and could have a material adverse effect on our results of operations or cash flows in a particular period.

As of December 31, 2021, we did not have any material indemnification claims that were probable or reasonably possible.

Legal Matters

ANTITRUST INVESTIGATIONS

On November 30, 2010, the EC's Directorate General for Competition opened an investigation into various antitrust-related complaints against us.

On June 27, 2017, the EC announced its decision that certain actions taken by Google regarding its display and ranking of shopping search results and ads infringed European competition law. The EC decision imposed a €2.4 billion (\$2.7 billion as of June 27, 2017) fine. On September 11, 2017, we appealed the EC decision to the General Court, and on September 27, 2017, we implemented product changes to bring shopping ads into compliance with the EC's decision. We recognized a charge of \$2.7 billion for the fine in the second quarter of 2017. On November 10, 2021, the General Court rejected our appeal, and we subsequently filed an appeal with the European Court of Justice on January 20, 2022.

On July 18, 2018, the EC announced its decision that certain provisions in Google's Android-related distribution agreements infringed European competition law. The EC decision imposed a €4.3 billion (\$5.1 billion as of June 30, 2018) fine and directed the termination of the conduct at issue. On October 9, 2018, we appealed the EC decision. On October 29, 2018, we implemented changes to certain of our Android distribution practices. We recognized a charge of \$5.1 billion for the fine in the second quarter of 2018.

On March 20, 2019, the EC announced its decision that certain contractual provisions in agreements that Google had with AdSense for Search partners infringed European competition law. The EC decision imposed a fine of €1.5 billion (\$1.7 billion as of March 20, 2019) and directed actions related to AdSense for Search partners' agreements, which we implemented prior to the decision. On June 4, 2019, we appealed the EC decision. We recognized a charge of \$1.7 billion for the fine in the first quarter of 2019.

While each EC decision is under appeal, we included the fines in accrued expenses and other current liabilities on our Consolidated Balance Sheets as we provided bank guarantees (in lieu of a cash payment) for the fines.

From time to time we are subject to formal and informal inquiries and investigations on competition matters by regulatory authorities in the U.S., Europe, and other jurisdictions. In August 2019, we began receiving civil investigative demands from the U.S. Department of Justice (DOJ) requesting information and documents relating to our prior antitrust investigations and certain aspects of our business. The DOJ and a number of state Attorneys General filed a lawsuit on October 20, 2020 alleging that Google violated U.S. antitrust laws relating to Search and Search advertising. Separately, on December 16, 2020, a number of state Attorneys General filed an antitrust complaint against Google in the U.S. District Court for the Eastern District of Texas, alleging that Google violated U.S. antitrust laws as well as state deceptive trade laws relating to its advertising technology. On June 22, 2021, the EC opened a formal investigation into Google's advertising technology business practices. On July 7, 2021, a number of state Attorneys General filed an antitrust complaint against us in the U.S. District Court for the Northern District of California, alleging that Google's operation of Android and Google Play violated U.S. antitrust laws and state antitrust and consumer protection laws. We believe these complaints are without merit and will defend ourselves vigorously. The DOJ and state Attorneys General continue their investigations into certain aspects of our business. We continue to cooperate with federal and state regulators in the U.S., the EC and other regulators around the world.

PATENT AND INTELLECTUAL PROPERTY CLAIMS

We have had patent, copyright, trade secret, and trademark infringement lawsuits filed against us claiming that certain of our products, services, and technologies infringe others' intellectual property rights. Adverse results in these lawsuits may include awards of substantial monetary damages, costly royalty or licensing agreements, or orders preventing us from offering certain features, functionalities, products, or services. As a result, we may have to change our business practices and develop non-infringing products or technologies, which could result in a loss of revenues for us and otherwise harm our business. In addition, the U.S. International Trade Commission (ITC) has increasingly become an important forum to litigate intellectual property disputes because an ultimate loss in an ITC action can result in a prohibition on importing infringing products into the U.S. Because the U.S. is an important market, a prohibition on importation could have an adverse effect on us, including preventing us from importing many important products into the U.S. or necessitating workarounds that may limit certain features of our products.

Furthermore, many of our agreements with our customers and partners require us to indemnify them against certain intellectual property infringement claims, which would increase our costs as a result of defending such claims, and may require that we pay significant damages if there were an adverse ruling in any such claims. In addition, our customers and partners may discontinue the use of our products, services, and technologies, as a result of injunctions or otherwise, which could result in loss of revenues and adversely affect our business.

In 2010, Oracle America, Inc. (Oracle) brought a copyright lawsuit against Google in the Northern District of California, alleging that Google's Android operating system infringes Oracle's copyrights related to certain Java application programming interfaces (Java APIs). After trial, final judgment was entered by the district court in favor of Google on June 8, 2016, and the court decided post-trial motions in favor of Google. Oracle appealed and on March 27, 2018, the Federal Circuit Court of Appeals reversed and remanded the case for a trial on damages. On May 29, 2018, we filed a petition for a rehearing at the Federal Circuit, and on August 28, 2018, the Federal Circuit denied the petition. On January 24, 2019, we filed a petition to the U.S. Supreme Court to review the case. On April 29, 2019, the Supreme Court requested the views of the Solicitor General regarding our petition. On September 27, 2019, the Solicitor General recommended denying our petition, and we provided our response on October 16, 2019. On November 15, 2019, the Supreme Court granted our petition and made a decision to review the case. The Supreme Court heard oral arguments in our case on October 7, 2020. On April 5, 2021, the Supreme Court reversed the Federal Circuit's ruling and found that Google's use of the Java APIs was a fair use as a matter of law. The Supreme Court remanded the case to the Federal Circuit for further proceedings in conformity with the Supreme Court opinion. On May 14, 2021, the Federal Circuit entered an order affirming the district court's final judgment in favor of Google. On June 21, 2021, the Federal Circuit issued a mandate returning the case to the district court, and the case is now concluded.

OTHER

We are also regularly subject to claims, suits, regulatory and government investigations, other proceedings, and consent decrees involving competition, intellectual property, privacy, tax and related compliance, labor and employment, commercial disputes, content generated by our users, goods and services offered by advertisers or publishers using our platforms, personal injury, consumer protection, and other matters. For example, we have a number of privacy investigations and suits ongoing in multiple jurisdictions. Such claims, suits, regulatory and government investigations, other proceedings, and consent decrees could result in substantial fines and penalties, injunctive relief, ongoing auditing and monitoring obligations, changes to our products and services, alterations to our business models and operations, and collateral related civil litigation or other adverse consequences, all of which could harm our business, reputation, financial condition, and operating results.

Certain of these outstanding matters include speculative, substantial or indeterminate monetary amounts. We record a liability when we believe that it is probable that a loss has been incurred, and the amount can be reasonably estimated. If we determine that a loss is reasonably possible and the loss or range of loss can be estimated, we disclose the reasonably possible loss. We evaluate developments in our legal matters that could affect the amount of liability that has been previously accrued, and the matters and related reasonably possible losses disclosed, and make adjustments as appropriate. Significant judgment is required to determine both the likelihood of there being and the estimated amount of a loss related to such matters.

With respect to our outstanding matters, based on our current knowledge, we believe that the amount or range of reasonably possible loss will not, either individually or in aggregate, have a material adverse effect on our business, consolidated financial position, results of operations, or cash flows. However, the outcome of such matters is inherently unpredictable and subject to significant uncertainties.

We expense legal fees in the period in which they are incurred.

Non-Income Taxes

We are under audit by various domestic and foreign tax authorities with regards to non-income tax matters. The subject matter of non-income tax audits primarily arises from disputes on the tax treatment and tax rate applied to the sale of our products and services in these jurisdictions and the tax treatment of certain employee benefits. We accrue non-income taxes that may result from examinations by, or any negotiated agreements with, these tax authorities when a loss is probable and reasonably estimable. If we determine that a loss is reasonably possible and the loss or range of loss can be estimated, we disclose the reasonably possible loss. Due to the inherent complexity and uncertainty of these matters and judicial process in certain jurisdictions, the final outcome may be materially different from our expectations.

For information regarding income tax contingencies, see Note 14.

Note 11. Stockholders' Equity

Preferred Stock

Our Board of Directors has authorized 100 million shares of preferred stock, \$0.001 par value, issuable in series. As of December 31, 2020 and 2021, no shares were issued or outstanding.

Class A and Class B Common Stock and Class C Capital Stock

Our Board of Directors has authorized three classes of stock, Class A and Class B common stock, and Class C capital stock. The rights of the holders of each class of our common and capital stock are identical, except with respect to voting. Each share of Class A common stock is entitled to one vote per share. Each share of Class B common stock is entitled to 10 votes per share. Class C capital stock has no voting rights, except as required by applicable law. Shares of Class B common stock may be converted at any time at the option of the stockholder and automatically convert upon sale or transfer to Class A common stock.

Share Repurchases

In April 2021, the Board of Directors of Alphabet authorized the company to repurchase up to \$50.0 billion of its Class C stock. In July 2021, the Alphabet board approved an amendment to the April 2021 authorization, permitting the company to repurchase both Class A and Class C shares in a manner deemed in the best interest of the company and its stockholders, taking into account the economic cost and prevailing market conditions, including the relative trading prices and volumes of the Class A and Class C shares. As of December 31, 2021, \$17.4 billion remains available for Class A and Class C share repurchases under the amended authorization.

In accordance with the authorizations of the Board of Directors of Alphabet, during the years ended December 31, 2020 and 2021, we repurchased and subsequently retired 21.5 million and 20.3 million aggregate shares for \$31.1 billion and \$50.3 billion, respectively. Of the aggregate amount repurchased and subsequently retired during 2021, 1.2 million shares were Class A stock for \$3.4 billion.

Stock Split Effected in Form of Stock Dividend ("Stock Split")

On February 1, 2022, the Company announced that the Board of Directors had approved and declared a 20-for-one stock split in the form of a one-time special stock dividend on each share of the Company's Class A, Class B, and Class C stock. The Stock Split is subject to stockholder approval of an amendment to the Company's Amended and Restated Certificate of Incorporation to increase the number of authorized shares of Class A, Class B, and Class C stock to accommodate the Stock Split.

If approval is obtained, each of the Company's stockholders of record at the close of business on July 1, 2022 (the "Record Date"), will receive, after the close of business on July 15, 2022, a dividend of 19 additional shares of the same class of stock for every share held by such stockholder as of the Record Date.

Note 12. Net Income Per Share

We compute net income per share of Class A, Class B, and Class C stock using the two-class method. Basic net income per share is computed using the weighted-average number of shares outstanding during the period. Diluted net income per share is computed using the weighted-average number of shares and the effect of potentially dilutive securities outstanding during the period. Potentially dilutive securities consist of restricted stock units and other contingently issuable shares. The dilutive effect of outstanding restricted stock units and other contingently issuable shares is reflected in diluted earnings per share by application of the treasury stock method. The computation of the diluted net income per share of Class A stock assumes the conversion of Class B stock, while the diluted net income per share of Class B stock does not assume the conversion of those shares.

The rights, including the liquidation and dividend rights, of the holders of our Class A, Class B, and Class C stock are identical, except with respect to voting. Furthermore, there are a number of safeguards built into our certificate of incorporation, as well as Delaware law, which preclude our Board of Directors from declaring or paying unequal per share dividends on our Class A, Class B, and Class C stock. Specifically, Delaware law provides that amendments to our certificate of incorporation which would have the effect of adversely altering the rights, powers, or preferences of a given class of stock must be approved by the class of stock adversely affected by the proposed amendment. In addition, our certificate of incorporation provides that before any such amendment may be put to a stockholder vote, it must be approved by the unanimous consent of our Board of Directors. As a result, the undistributed earnings for each year are allocated based on the contractual participation rights of the Class A, Class B, and Class C stock as if the earnings for the year had been distributed. As the liquidation and dividend rights are identical, the undistributed earnings are allocated on a proportionate basis.

In the years ended December 31, 2019, 2020 and 2021, the net income per share amounts are the same for Class A, Class B, and Class C stock because the holders of each class are entitled to equal per share dividends or distributions in liquidation in accordance with the Amended and Restated Certificate of Incorporation of Alphabet Inc.

The following tables set forth the computation of basic and diluted net income per share of Class A, Class B, and Class C stock (in millions, except share amounts which are reflected in thousands and per share amounts):

	Year Ended December 31,		
	2019		
	Class A	Class B	Class C
Basic net income per share:			
Numerator			
Allocation of undistributed earnings	\$ 14,846	\$ 2,307	\$ 17,190
Denominator			
Number of shares used in per share computation	299,402	46,527	346,667
Basic net income per share	\$ 49.59	\$ 49.59	\$ 49.59
Diluted net income per share:			
Numerator			
Allocation of undistributed earnings for basic computation	\$ 14,846	\$ 2,307	\$ 17,190
Reallocation of undistributed earnings as a result of conversion of Class B to Class A shares	2,307	0	0
Reallocation of undistributed earnings	(126)	(20)	126
Allocation of undistributed earnings	\$ 17,027	\$ 2,287	\$ 17,316
Denominator			
Number of shares used in basic computation	299,402	46,527	346,667
Weighted-average effect of dilutive securities			
Add:			
Conversion of Class B to Class A shares outstanding	46,527	0	0
Restricted stock units and other contingently issuable shares	413	0	5,547
Number of shares used in per share computation	346,342	46,527	352,214
Diluted net income per share	\$ 49.16	\$ 49.16	\$ 49.16

	Year Ended December 31,		
	2020		
	Class A	Class B	Class C
Basic net income per share:			
Numerator			
Allocation of undistributed earnings	\$ 17,733	\$ 2,732	\$ 19,804
Denominator			
Number of shares used in per share computation	299,815	46,182	334,819
Basic net income per share	\$ 59.15	\$ 59.15	\$ 59.15
Diluted net income per share:			
Numerator			
Allocation of undistributed earnings for basic computation	\$ 17,733	\$ 2,732	\$ 19,804
Reallocation of undistributed earnings as a result of conversion of Class B to Class A shares	2,732	0	0
Reallocation of undistributed earnings	(180)	(25)	180
Allocation of undistributed earnings	\$ 20,285	\$ 2,707	\$ 19,984
Denominator			
Number of shares used in basic computation	299,815	46,182	334,819
Weighted-average effect of dilutive securities			
Add:			
Conversion of Class B to Class A shares outstanding	46,182	0	0
Restricted stock units and other contingently issuable shares	87	0	6,125
Number of shares used in per share computation	346,084	46,182	340,944
Diluted net income per share	\$ 58.61	\$ 58.61	\$ 58.61

	Year Ended December 31,		
	2021		
	Class A	Class B	Class C
Basic net income per share:			
Numerator			
Allocation of undistributed earnings	\$ 34,200	\$ 5,174	\$ 36,659
Denominator			
Number of shares used in per share computation	300,310	45,430	321,910
Basic net income per share	\$ 113.88	\$ 113.88	\$ 113.88
Diluted net income per share:			
Numerator			
Allocation of undistributed earnings for basic computation	\$ 34,200	\$ 5,174	\$ 36,659
Reallocation of undistributed earnings as a result of conversion of Class B to Class A shares	5,174	0	0
Reallocation of undistributed earnings	(581)	(77)	581
Allocation of undistributed earnings	\$ 38,793	\$ 5,097	\$ 37,240
Denominator			
Number of shares used in basic computation	300,310	45,430	321,910
Weighted-average effect of dilutive securities			
Add:			
Conversion of Class B to Class A shares outstanding	45,430	0	0
Restricted stock units and other contingently issuable shares	15	0	10,009
Number of shares used in per share computation	345,755	45,430	331,919
Diluted net income per share	\$ 112.20	\$ 112.20	\$ 112.20

Note 13. Compensation Plans

Stock Plans

Our stock plans include the Alphabet Amended and Restated 2012 Stock Plan, the Alphabet 2021 Stock Plan and Other Bet stock-based plans. Under our stock plans, RSUs and other types of awards may be granted. An RSU award is an agreement to issue shares of our Class C stock at the time the award vests. RSUs generally vest over four years contingent upon employment on the vesting date.

As of December 31, 2021, there were 37,479,707 shares of Class C stock reserved for future issuance under the Alphabet 2021 Stock Plan.

STOCK-BASED COMPENSATION

For the years ended December 31, 2019, 2020, and 2021, total stock-based compensation expense was \$11.7 billion, \$13.4 billion, and \$15.7 billion, including amounts associated with awards we expect to settle in Alphabet stock of \$10.8 billion, \$12.8 billion, and \$15.0 billion, respectively.

For the years ended December 31, 2019, 2020, and 2021, we recognized tax benefits on total stock-based compensation expense, which are reflected in the provision for income taxes in the Consolidated Statements of Income, of \$1.8 billion, \$2.7 billion, and \$3.1 billion, respectively.

For the years ended December 31, 2019, 2020, and 2021, tax benefit realized related to awards vested or exercised during the period was \$2.2 billion, \$3.6 billion, and \$5.9 billion, respectively. These amounts do not include the indirect effects of stock-based awards, which primarily relate to the R&D tax credit.

STOCK-BASED AWARD ACTIVITIES

The following table summarizes the activities for unvested Alphabet RSUs for the year ended December 31, 2021:

	Unvested Restricted Stock Units	
	Number of Shares	Weighted-Average Grant-Date Fair Value
Unvested as of December 31, 2020	19,288,793	\$ 1,262.13
Granted	10,582,700	1,949.16
Vested	(11,209,486)	1,345.98
Forfeited/canceled	(1,767,294)	1,425.48
Unvested as of December 31, 2021	16,894,713	\$ 1,626.13

The weighted-average grant-date fair value of RSUs granted during the years ended December 31, 2019 and 2020 was \$1,092.36 and \$1,407.97, respectively. Total fair value of RSUs, as of their respective vesting dates, during the years ended December 31, 2019, 2020, and 2021 were \$15.2 billion, \$17.8 billion, and \$28.8 billion, respectively.

As of December 31, 2021, there was \$25.8 billion of unrecognized compensation cost related to unvested employee RSUs. This amount is expected to be recognized over a weighted-average period of 2.5 years.

401(k) Plans

We have two 401(k) Savings Plans that qualify as deferred salary arrangements under Section 401(k) of the Internal Revenue Code. Under these 401(k) Plans, matching contributions are based upon the amount of the employees' contributions subject to certain limitations. We recognized expense of approximately \$724 million, \$855 million, and \$916 million for the years ended December 31, 2019, 2020, and 2021, respectively.

Note 14. Income Taxes

Income from continuing operations before income taxes consisted of the following (in millions):

	Year Ended December 31,		
	2019	2020	2021
Domestic operations	\$ 16,426	\$ 37,576	\$ 77,016
Foreign operations	23,199	10,506	13,718
Total	\$ 39,625	\$ 48,082	\$ 90,734

Provision for income taxes consisted of the following (in millions):

	Year Ended December 31,		
	2019	2020	2021
Current:			
Federal and state	\$ 2,424	\$ 4,789	\$ 10,126
Foreign	2,713	1,687	2,692
Total	5,137	6,476	12,818
Deferred:			
Federal and state	286	1,552	2,018
Foreign	(141)	(215)	(135)
Total	145	1,337	1,883
Provision for income taxes	\$ 5,282	\$ 7,813	\$ 14,701

The reconciliation of federal statutory income tax rate to our effective income tax rate was as follows:

	Year Ended December 31,		
	2019	2020	2021
U.S. federal statutory tax rate	21.0%	21.0%	21.0%
Foreign income taxed at different rates	(4.9)	(0.3)	0.2
Foreign-derived intangible income deduction	(0.7)	(3.0)	(2.5)
Stock-based compensation expense	(0.7)	(1.7)	(2.5)
Federal research credit	(2.5)	(2.3)	(1.6)
Deferred tax asset valuation allowance	0.0	1.4	0.6
State and local income taxes	1.1	1.1	1.0
Effective tax rate	13.3%	16.2%	16.2%

Our effective tax rate for 2019 was affected significantly by earnings realized in foreign jurisdictions with statutory tax rates lower than the federal statutory tax rate because substantially all of the income from foreign operations was earned by an Irish subsidiary. As of December 31, 2019, we have simplified our corporate legal entity structure and now license intellectual property from the U.S. that was previously licensed from Bermuda resulting in an increase in the portion of our income earned in the U.S.

On July 27, 2015, the U.S. Tax Court, in an opinion in *Altera Corp. v. Commissioner*, invalidated the portion of the Treasury regulations issued under IRC Section 482 requiring related-party participants in a cost sharing arrangement to share stock-based compensation costs. The U.S. Tax Court issued the final decision on December 28, 2015. As a result of that decision, we recorded a tax benefit related to the anticipated reimbursement of cost share payment for previously shared stock-based compensation costs.

On June 7, 2019, the U.S. Court of Appeals for the Ninth Circuit overturned the 2015 Tax Court decision in *Altera Corp. v. Commissioner*, and upheld the portion of the Treasury regulations issued under IRC Section 482 requiring related-party participants in a cost sharing arrangement to share stock-based compensation costs. As a result of the Ninth Circuit court decision, our cumulative net tax benefit of \$418 million related to previously shared stock-based compensation costs was reversed in the year ended December 31, 2019.

In 2020, there was an increase in valuation allowance for net deferred tax assets that are not likely to be realized relating to certain of our Other Bets.

Deferred Income Taxes

Deferred income taxes reflect the net effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of our deferred tax assets and liabilities were as follows (in millions):

	As of December 31,	
	2020	2021
Deferred tax assets:		
Accrued employee benefits	\$ 580	\$ 549
Accruals and reserves not currently deductible	1,049	1,816
Tax credits	3,723	5,179
Net operating losses	1,085	1,790
Operating leases	2,620	2,503
Intangible assets	1,525	2,034
Other	981	925
Total deferred tax assets	11,563	14,796
Valuation allowance	(4,823)	(7,129)
Total deferred tax assets net of valuation allowance	6,740	7,667
Deferred tax liabilities:		
Property and equipment, net	(3,382)	(5,237)
Net investment gains	(1,901)	(3,229)
Operating leases	(2,354)	(2,228)
Other	(1,580)	(946)
Total deferred tax liabilities	(9,217)	(11,640)
Net deferred tax assets (liabilities)	\$ (2,477)	\$ (3,973)

As of December 31, 2021, our federal, state, and foreign net operating loss carryforwards for income tax purposes were approximately \$5.6 billion, \$4.6 billion, and \$1.7 billion respectively. If not utilized, the federal net operating loss carryforwards will begin to expire in 2023, foreign net operating loss carryforwards will begin to expire in 2025 and the state net operating loss carryforwards will begin to expire in 2028. It is more likely than not that certain net operating loss carryforwards will not be realized; therefore, we have recorded a valuation allowance against them. The net operating loss carryforwards are subject to various annual limitations under the tax laws of the different jurisdictions.

As of December 31, 2021, our California R&D carryforwards for income tax purposes were approximately \$5.0 billion that can be carried over indefinitely. We believe the state tax credit is not likely to be realized.

As of December 31, 2021, our investment tax credit carryforwards for state income tax purposes were approximately \$700 million and will begin to expire in 2025. We use the flow-through method of accounting for investment tax credits. We believe this tax credit is not likely to be realized.

As of December 31, 2021, we maintained a valuation allowance with respect to California deferred tax assets, certain federal net operating losses, certain state tax credits, net deferred tax assets relating to certain Other Bets, and certain foreign net operating losses that we believe are not likely to be realized. We continue to reassess the remaining valuation allowance quarterly, and if future evidence allows for a partial or full release of the valuation allowance, a tax benefit will be recorded accordingly.

Uncertain Tax Positions

The following table summarizes the activity related to our gross unrecognized tax benefits (in millions):

	Year Ended December 31,		
	2019	2020	2021
Beginning gross unrecognized tax benefits	\$ 4,652	\$ 3,377	\$ 3,837
Increases related to prior year tax positions	938	372	529
Decreases related to prior year tax positions	(143)	(557)	(263)
Decreases related to settlement with tax authorities	(2,886)	(45)	(329)
Increases related to current year tax positions	816	690	1,384
Ending gross unrecognized tax benefits	\$ 3,377	\$ 3,837	\$ 5,158

The total amount of gross unrecognized tax benefits was \$3.4 billion, \$3.8 billion, and \$5.2 billion as of December 31, 2019, 2020, and 2021, respectively, of which \$2.3 billion, \$2.6 billion, and \$3.7 billion, if recognized, would affect our effective tax rate, respectively.

As of December 31, 2020 and 2021, we accrued \$222 million and \$270 million in interest and penalties in provision for income taxes, respectively.

We file income tax returns in the U.S. federal jurisdiction and in many state and foreign jurisdictions. Our two major tax jurisdictions are the U.S. federal and Ireland. We are subject to the continuous examination of our income tax returns by the IRS and other tax authorities. The IRS is currently examining our 2016 through 2018 tax returns. We have also received tax assessments in multiple foreign jurisdictions asserting transfer pricing adjustments or permanent establishment. We continue to defend any and all such claims as presented.

The tax years 2014 through 2020 remain subject to examination by the appropriate governmental agencies for Irish tax purposes. There are other ongoing audits in various other jurisdictions that are not material to our financial statements.

We regularly assess the likelihood of adverse outcomes resulting from these examinations to determine the adequacy of our provision for income taxes. We continue to monitor the progress of ongoing discussions with tax authorities and the effect, if any, of the expected expiration of the statute of limitations in various taxing jurisdictions.

We believe that an adequate provision has been made for any adjustments that may result from tax examinations. However, the outcome of tax audits cannot be predicted with certainty. If any issues addressed in our tax audits are resolved in a manner not consistent with management's expectations, we could be required to adjust our provision for income taxes in the period such resolution occurs. Although the timing of resolution, settlement, and closure of audits is not certain, it is reasonably possible that our unrecognized tax benefits from certain U.S. federal, state and non U.S. tax positions could decrease by approximately \$2.0 billion in the next 12 months. Positions that may be resolved include various U.S. and non-U.S. matters.

Note 15. Information about Segments and Geographic Areas

We report our segment results as Google Services, Google Cloud, and Other Bets:

- Google Services includes products and services such as ads, Android, Chrome, hardware, Google Maps, Google Play, Search, and YouTube. Google Services generates revenues primarily from advertising; sales of apps and in-app purchases, digital content products, and hardware; and fees received for subscription-based products such as YouTube Premium and YouTube TV.
- Google Cloud includes Google's infrastructure and platform services, collaboration tools, and other services for enterprise customers. Google Cloud generates revenues from fees received for Google Cloud Platform services, Google Workspace collaboration tools and other enterprise services.
- Other Bets is a combination of multiple operating segments that are not individually material. Revenues from Other Bets are generated primarily from the sale of health technology and internet services.

Revenues, certain costs, such as costs associated with content and traffic acquisition, certain engineering activities, and hardware, as well as certain operating expenses are directly attributable to our segments. Due to the integrated nature of Alphabet, other costs and expenses, such as technical infrastructure and office facilities, are managed centrally at a consolidated level. The associated costs, including depreciation and impairment, are allocated to operating segments as a service cost generally based on usage or headcount.

Unallocated corporate costs primarily include corporate initiatives, corporate shared costs, such as finance and legal, including certain fines and settlements, as well as costs associated with certain shared R&D activities. Additionally, hedging gains (losses) related to revenue are included in corporate costs.

Our operating segments are not evaluated using asset information.

Information about segments during the periods presented were as follows (in millions). For comparative purposes, amounts in prior periods have been recast:

	Year Ended December 31,		
	2019	2020	2021
Revenues:			
Google Services	\$ 151,825	\$ 168,635	\$ 237,529
Google Cloud	8,918	13,059	19,206
Other Bets	659	657	753
Hedging gains (losses)	455	176	149
Total revenues	\$ 161,857	\$ 182,527	\$ 257,637
Operating income (loss):			
Google Services	\$ 48,999	\$ 54,606	\$ 91,855
Google Cloud	(4,645)	(5,607)	(3,099)
Other Bets	(4,824)	(4,476)	(5,281)
Corporate costs, unallocated ⁽¹⁾	(5,299)	(3,299)	(4,761)
Total income from operations	\$ 34,231	\$ 41,224	\$ 78,714

(1) Corporate costs, unallocated includes a fine and legal settlement totaling \$2.3 billion for the year ended December 31, 2019.

For revenues by geography, see Note 2.

The following table presents long-lived assets by geographic area, which includes property and equipment, net and operating lease assets (in millions):

	As of December 31,	
	2020	2021
Long-lived assets:		
United States	\$ 69,315	\$ 80,207
International	27,645	30,351
Total long-lived assets	\$ 96,960	\$ 110,558

— ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

— ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our chief executive officer and chief financial officer, evaluated the effectiveness of our disclosure controls and procedures pursuant to Rule 13a-15 under the Exchange Act, as of the end of the period covered by this Annual Report on Form 10-K.

Based on this evaluation, our chief executive officer and chief financial officer concluded that, as of December 31, 2021, our disclosure controls and procedures are designed at a reasonable assurance level and are effective to provide reasonable assurance that information we are required to disclose in reports that we file or submit under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to our management, including our chief executive officer and chief financial officer, as appropriate, to allow timely decisions regarding required disclosure.

Changes in Internal Control over Financial Reporting

We rely extensively on information systems to manage our business and summarize and report operating results. In 2019, we began a multi-year implementation of a new global ERP system, which will replace much of our existing core financial systems. The ERP system is designed to accurately maintain our financial records, enhance the flow of financial information, improve data management and provide timely information to our management team. The implementation is expected to continue in phases over the next few years. We completed the implementation of certain of our subledgers, which included changes to our processes, procedures and internal controls over financial reporting during the second quarter of 2021. There have been no changes in our internal control over financial reporting that occurred during the quarter ended December 31, 2021 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. However, as the phased implementation of the new ERP system continues, we will change our processes and procedures, which in turn, could result in changes to our internal control over financial reporting. As such changes occur, we will evaluate quarterly whether such changes materially affect our internal control over financial reporting.

As a result of COVID-19, our global workforce continued to operate primarily in a work from home environment for the quarter ended December 31, 2021. While we continue to evolve our work model in response to the uneven effects of the ongoing pandemic around the world, we believe that our internal controls over financial reporting continue to be effective. We have continued to re-evaluate and refine our financial reporting process to provide reasonable assurance that we could report our financial results accurately and in a timely manner.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rule 13a-15(f) of the Exchange Act. Our management conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework in *Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework). Based on this evaluation, management concluded that our internal control over financial reporting was effective as of December 31, 2021. Management reviewed the results of its assessment with our Audit and Compliance Committee. The effectiveness of our internal control over financial reporting as of December 31, 2021 has been audited by Ernst & Young LLP, an independent registered public accounting firm, as stated in its report which is included in Item 8 of this Annual Report on Form 10-K.

Limitations on Effectiveness of Controls and Procedures

In designing and evaluating the disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives. In addition, the design of disclosure controls and procedures must reflect the fact that there are resource constraints and that management is required to apply its judgment in evaluating the benefits of possible controls and procedures relative to their costs.

— ITEM 9B. OTHER INFORMATION

None.

— **ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS**

Not applicable.



● PART III

— ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by this item will be included under the caption “Directors, Executive Officers, and Corporate Governance” in our Proxy Statement for the 2022 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2021 (2022 Proxy Statement) and is incorporated herein by reference. The information required by this item regarding delinquent filers pursuant to Item 405 of Regulation S-K will be included under the caption “Delinquent Section 16(a) Reports” in the 2022 Proxy Statement and is incorporated herein by reference.

— ITEM 11. EXECUTIVE COMPENSATION

The information required by this item will be included under the captions “Director Compensation,” “Executive Compensation” and “Directors, Executive Officers, and Corporate Governance—Corporate Governance and Board Matters—Compensation Committee Interlocks and Insider Participation” in the 2022 Proxy Statement and is incorporated herein by reference.

— ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this item will be included under the captions “Common Stock Ownership of Certain Beneficial Owners and Management” and “Equity Compensation Plan Information” in the 2022 Proxy Statement and is incorporated herein by reference.

— **ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE**

The information required by this item will be included under the captions “Certain Relationships and Related Transactions” and “Directors, Executive Officers, and Corporate Governance—Corporate Governance and Board Matters—Director Independence” in the 2022 Proxy Statement and is incorporated herein by reference.

— **ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES**

The information required by this item will be included under the caption “Independent Registered Public Accounting Firm” in the 2022 Proxy Statement and is incorporated herein by reference.

PART IV

— ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

We have filed the following documents as part of this Annual Report on Form 10-K:

1. Consolidated Financial Statements

REPORTS OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM	43
FINANCIAL STATEMENTS:	
CONSOLIDATED BALANCE SHEETS	44
CONSOLIDATED STATEMENTS OF INCOME	45
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME	46
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY	47
CONSOLIDATED STATEMENTS OF CASH FLOWS	48
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS	49

2. Financial Statement Schedules

Schedule II: Valuation and Qualifying Accounts

The table below details the activity of the allowance for credit losses and sales credits for the years ended December 31, 2019, 2020 and 2021 (in millions):

	Balance at Beginning of Year	Additions	Usage	Balance at End of Year
Year ended December 31, 2019	\$ 729	\$ 1,481	\$ (1,457)	\$ 753
Year ended December 31, 2020	\$ 753	\$ 2,013	\$ (1,422)	\$ 1,344
Year ended December 31, 2021	\$ 1,344	\$ 2,092	\$ (2,047)	\$ 1,389

Note: Additions to the allowance for credit losses are charged to expense. Additions to the allowance for sales credits are charged against revenues.

All other schedules have been omitted because they are not required, not applicable, or the required information is otherwise included.

3. Exhibits

Exhibit Number	Description	Incorporated by reference herein	
		Form	Date
2.01	Agreement and Plan of Merger, dated October 2, 2015, by and among Google Inc., the Registrant and Maple Technologies Inc.	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
3.01	Amended and Restated Certificate of Incorporation of the Registrant, dated October 2, 2015	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
3.02	Amended and Restated Bylaws of the Registrant, dated October 21, 2020	Current Report on Form 8-K/A (File No. 001-37580)	October 27, 2020
4.01	Specimen Class A Common Stock certificate	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
4.02	Specimen Class C Capital Stock certificate	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
4.03	Alphabet Inc. Deferred Compensation Plan	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
4.04	Transfer Restriction Agreement, dated October 2, 2015, between the Registrant and Larry Page and certain of his affiliates	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
4.05	Transfer Restriction Agreement, dated October 2, 2015, between the Registrant and Sergey Brin and certain of his affiliates	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
4.06	* Joinder Agreement, dated December 31, 2021, among the Registrant, Sergey Brin and certain of his affiliates		
4.07	Transfer Restriction Agreement, dated October 2, 2015, between the Registrant and Eric E. Schmidt and certain of its affiliates	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
4.08	Class C Undertaking, dated October 2, 2015, executed by the Registrant	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
4.09	Indenture, dated February 12, 2016, between the Registrant and The Bank of New York Mellon Trust Company, N.A., as Trustee	Registration Statement on Form S-3 (File No. 333-209510)	February 12, 2016
4.10	Registrant Registration Rights Agreement dated December 14, 2015	Registration Statement on Form S-3 (File No. 333-209518)	February 12, 2016
4.11	First Supplemental Indenture, dated April 27, 2016, between the Registrant and The Bank of New York Mellon Trust Company, N.A., as trustee	Current Report on Form 8-K (File No. 001-37580)	April 27, 2016
4.12	Form of the Registrant's 3.375% Notes due 2024 (included in Exhibit 4.11)		
4.13	Form of the Registrant's 1.998% Note due 2026	Current Report on Form 8-K (File No. 001-37580)	August 9, 2016
4.14	Form of Global Note representing the Registrant's 0.450% notes due 2025	Current Report on Form 8-K (File No. 001-37580)	August 5, 2020
4.15	Form of Global Note representing the Registrant's 0.800% notes due 2027	Current Report on Form 8-K (File No. 001-37580)	August 5, 2020
4.16	Form of Global Note representing the Registrant's 1.100% notes due 2030	Current Report on Form 8-K (File No. 001-37580)	August 5, 2020
4.17	Form of Global Note representing the Registrant's 1.900% notes due 2040	Current Report on Form 8-K (File No. 001-37580)	August 5, 2020
4.18	Form of Global Note representing the Registrant's 2.050% notes due 2050	Current Report on Form 8-K (File No. 001-37580)	August 5, 2020

Exhibit Number	Description	Incorporated by reference herein	
		Form	Date
4.19	Form of Global Note representing the Registrant's 2.250% notes due 2060	Current Report on Form 8-K (File No. 001-37580)	August 5, 2020
4.20	* Description of Registrant's Securities		
10.01	◆ Form of Indemnification Agreement entered into between the Registrant, its affiliates and its directors and officers	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
10.02	◆ Compensation Plan Agreement, dated October 2, 2015, between Google Inc. and the Registrant	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
10.03	◆ Director Arrangements Agreement, dated October 2, 2015, between Google Inc. and the Registrant	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
10.04	◆ Alphabet Inc. Deferred Compensation Plan	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
10.05	◆ Google Inc. 2004 Stock Plan, as amended	Current Report on Form 8-K (File No. 000-50726)	June 7, 2011
10.05.1	◆ Google Inc. 2004 Stock Plan - Form of Google Stock Option Agreement	Annual Report on Form 10-K (File No. 000-50726)	March 30, 2005
10.05.2	◆ Google Inc. 2004 Stock Plan - Form of Google Restricted Stock Unit Agreement	Annual Report on Form 10-K (File No. 000-50726)	March 30, 2005
10.05.3	◆ Google Inc. 2004 Stock Plan - Amendment to Stock Option Agreements	Registration Statement on Form S-3 (File No. 333-142243)	April 20, 2007
10.06	◆ Alphabet Inc. Amended and Restated 2012 Stock Plan	Current Report on Form 8-K (File No. 001-37580)	June 5, 2020
10.06.1	◆ Alphabet Inc. Amended and Restated 2012 Stock Plan - Form of Alphabet Restricted Stock Unit Agreement	Annual Report on Form 10-K (File No. 001-37580)	February 4, 2020
10.06.2	◆ Alphabet Inc. Amended and Restated 2012 Stock Plan - Performance Stock Unit Agreement	Annual Report on Form 10-K (File No. 001-37580)	February 4, 2020
10.07	◆ Alphabet Inc. 2021 Stock Plan	Current Report on Form 8-K (file No. 001-37580)	June 4, 2021
10.07.1	◆ Alphabet Inc. 2021 Stock Plan - Form of Alphabet Restricted Stock Unit Agreement	Quarterly Report on Form 10-Q (file No. 001-37580)	July 28, 2021
10.07.2	◆ * Alphabet Inc. 2021 Stock Plan - Form of Alphabet 2022 Non-CEO Performance Stock Unit Agreement		
10.08	◆ * Alphabet Inc. Company Bonus Plan		
14.01	Code of Conduct of the Registrant as amended on September 21, 2017	Annual Report on Form 10-K (File No. 001-37580)	February 6, 2018
21.01	* Subsidiaries of the Registrant		
23.01	* Consent of Independent Registered Public Accounting Firm		
24.01	* Power of Attorney (incorporated by reference to the signature page of this Annual Report on Form 10-K)		
31.01	* Certification of Chief Executive Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002		
31.02	* Certification of Chief Financial Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002		

Exhibit Number	Description	Incorporated by reference herein	
		Form	Date
32.01 ‡	Certifications of Chief Executive Officer and Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002		
101.INS *	Inline XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document		
101.SCH *	Inline XBRL Taxonomy Extension Schema Document		
101.CAL *	Inline XBRL Taxonomy Extension Calculation Linkbase Document		
101.DEF *	Inline XBRL Taxonomy Extension Definition Linkbase Document		
101.LAB *	Inline XBRL Taxonomy Extension Label Linkbase Document		
101.PRE *	Inline XBRL Taxonomy Extension Presentation Linkbase Document		
104	Cover Page Interactive Data File (embedded within the Inline XBRL document and contained in Exhibit 101)		

◆ Indicates management compensatory plan, contract, or arrangement.

* Filed herewith.

‡ Furnished herewith.

— ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this Annual Report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized.

Date: February 1, 2022

ALPHABET INC.

By: /S/ SUNDAR PICHAI

Sundar Pichai
Chief Executive Officer
(Principal Executive Officer
of the Registrant)

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Sundar Pichai and Ruth M. Porat, jointly and severally, his or her attorney-in-fact, with the power of substitution, for him or her in any and all capacities, to sign any amendments to this Annual Report on Form 10-K and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that each of said attorneys-in-fact, or his or her substitute or substitutes, may do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Exchange Act of 1934, this Annual Report on Form 10-K has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature	Title	Date
<u> /S/ SUNDAR PICHAI </u> Sundar Pichai	<i>Chief Executive Officer and Director (Principal Executive Officer)</i>	February 1, 2022
<u> /S/ RUTH M. PORAT </u> Ruth M. Porat	<i>Senior Vice President and Chief Financial Officer (Principal Financial Officer)</i>	February 1, 2022
<u> /S/ AMIE THUENER O'TOOLE </u> Amie Thuener O'Toole	<i>Vice President and Chief Accounting Officer (Principal Accounting Officer)</i>	February 1, 2022
<u> /S/ FRANCES H. ARNOLD </u> Frances H. Arnold	<i>Director</i>	February 1, 2022
<u> /S/ SERGEY BRIN </u> Sergey Brin	<i>Co-Founder and Director</i>	February 1, 2022
<u> /S/ L. JOHN DOERR </u> L. John Doerr	<i>Director</i>	February 1, 2022
<u> /S/ ROGER W. FERGUSON, JR. </u> Roger W. Ferguson, Jr.	<i>Director</i>	February 1, 2022
<u> /S/ JOHN L. HENNESSY </u> John L. Hennessy	<i>Director, Chair</i>	February 1, 2022
<u> /S/ ANN MATHER </u> Ann Mather	<i>Director</i>	February 1, 2022
<u> /S/ ALAN R. MULALLY </u> Alan R. Mulally	<i>Director</i>	February 1, 2022
<u> /S/ LARRY PAGE </u> Larry Page	<i>Co-Founder and Director</i>	February 1, 2022
<u> /S/ K. RAM SHRIRAM </u> K. Ram Shriram	<i>Director</i>	February 1, 2022
<u> /S/ ROBIN L. WASHINGTON </u> Robin L. Washington	<i>Director</i>	February 1, 2022

This page intentionally left blank

This page intentionally left blank

This page intentionally left blank

On the horizon

2021 deepened our belief that with the right technology, people, communities, and businesses everywhere can take on unprecedented challenges and opportunities. As we move forward, we'll stay focused on evolving our products, programs, and investments to be even more helpful in the lives of the people we serve.

2

0