

Alphabet

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To our investors,

2022 was a year full of change and uncertainty around the world. In February, when war broke out in Ukraine, our teams worked around-the-clock to make sure our products were helpful to people who needed them, from providing trustworthy information on Search to disrupting cyberattacks to partnering with the government to deploy air raid alerts. In March, I traveled to Warsaw, Poland, where I met Googlers hosting families who sought refuge, talked with entrepreneurs using our office spaces, and saw how our products like Google Translate were helping Ukrainians find a bit of hope and connection.

By late spring, the tech industry was adjusting to a more challenging macroeconomic environment, and as a company we embarked on efforts to sharpen our focus and make sure our efforts are aligned with our highest priorities. Near the end of the year, AI reached an inflection point, made possible by our foundational breakthroughs like Transformer and advances in diffusion models. It was an exciting moment for us after having worked to develop the technology responsibly for so many years. And on December 18, during the World Cup final, Google Search saw its highest query-per-second volume of all time, a strong signal of our momentum.

Through it all, we launched new products that helped us advance our mission: to organize the world's information and make it universally accessible and useful. Over the past few years, AI has emerged as the most important way we can advance our mission, and in 2022, we made some of our biggest technological advancements yet. In the area of natural language understanding, our latest model, PaLM, demonstrates breakthrough capabilities in language, reasoning, and code tasks. Breakthroughs in "chain of thought" prompting are helping to build systems that can perform multistep reasoning and break down complex problems into smaller tasks. We also

shared new generative models, including Imagen, our text-to-image model, and Phenaki, which can generate long, coherent videos from text prompts.

It's been especially exciting to see how AI advancements are making our products more helpful. Last year, we launched multisearch, a new way to search using both text and images, and it's now available in more than 70 languages. People use Lens more than 10 billion times per month to search with their camera or images, and its new, AI-powered translation feature blends translated text seamlessly into the background of images. And, thanks to a new machine learning technique, we added 24 new languages to Google Translate, including its first indigenous languages of the Americas.

The breakthroughs we're seeing are poised to transform every industry, and we're helping businesses tap into the new opportunities AI creates. Last year, we announced new products to help businesses solve problems using AI, including Translation Hub, which can be used to translate documents into 135 languages at a previously unimaginable scale and speed. We brought more AI-powered features to Google Workspace, including automatic summarization for Google Docs and Chat to help people get work done faster. To help advertisers create meaningful performance, last year we started incorporating large language models into broad match, a tool that makes it easier to match advertiser offers to search queries.

In the first few months of 2023, we've continued to roll out new products and features that help unlock incredible opportunities for consumers, partners, and businesses, including ours. Among them, we introduced PaLM API, an easy and safe way for developers to build on top of our language models, and generative AI capabilities in Google

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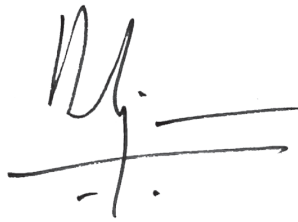
Directors and
executive officers

Cloud and Workspace. We also launched Bard, an early experiment for people to collaborate with generative AI. It's one way we are giving users direct access to large language models, and part of a natural journey where we'll continue to iterate and make progress.

AI is also helping us to find solutions to some of the world's biggest problems. We partnered with iCad to license our mammography technology for breast cancer screenings, which is being used in clinics for the first time. DeepMind's AlphaFold database grew by orders of magnitude, expanding from about one million to 200 million structures. One million researchers have used it around the world to help solve problems in sustainability, drug discovery, human biology, and more.

Beyond AI, we're excited about the continued momentum across our businesses. Just a few examples: YouTube Premium is now up to 80 million paying subscribers and trialers, an increase of 30 million from the year before. And YouTube Shorts is now averaging more than 50 billion daily views. We introduced our newest lineup of Pixel devices, and our Pixel 6a, Pixel 7, and Pixel 7 Pro are the best-selling generation of phones we've ever launched. And we continue to open cloud regions and invest in data centers around the world, including our first-ever data center in Japan.

In September, Google will turn 25. I am grateful to our employees, partners, and shareholders everywhere who have made this milestone possible, and look forward to what the next year – and quarter century – will bring.



Sundar Pichai
CEO of Alphabet and Google

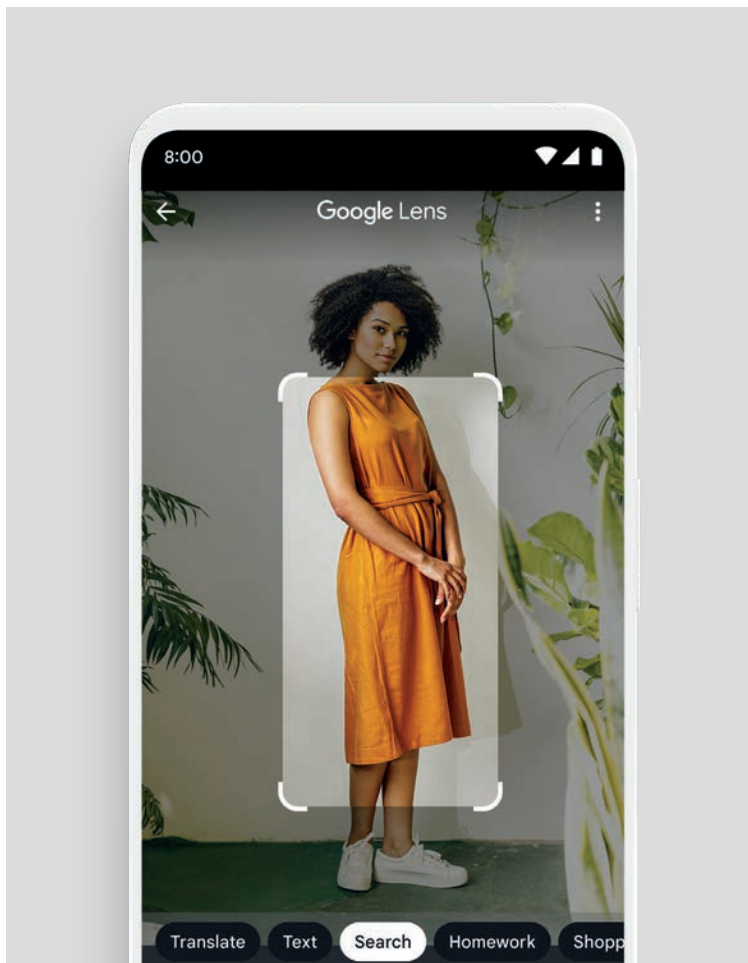
A year of agility and reinvention

2022 was another year of profound change and challenge. As the world contended with concurrent health, economic, social, and climate challenges, learning how to adapt became the new normal. At Google, we feel a responsibility to do our part, and do our best, by delivering products built to help. We strive every day to empower people, businesses, and communities with technology that can help them navigate our changing world.

Delivering products built to help

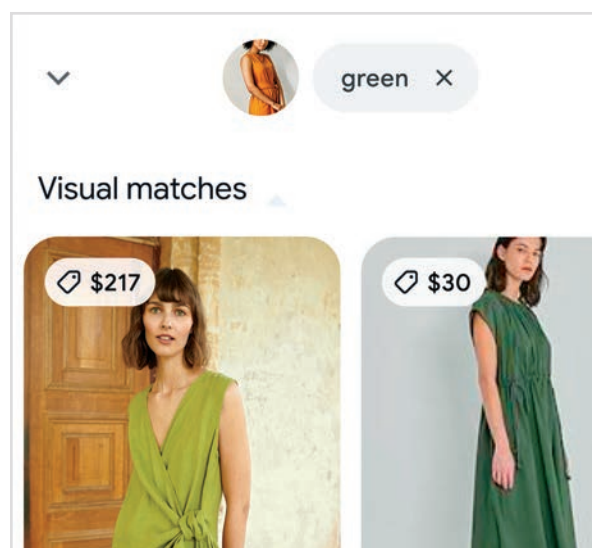
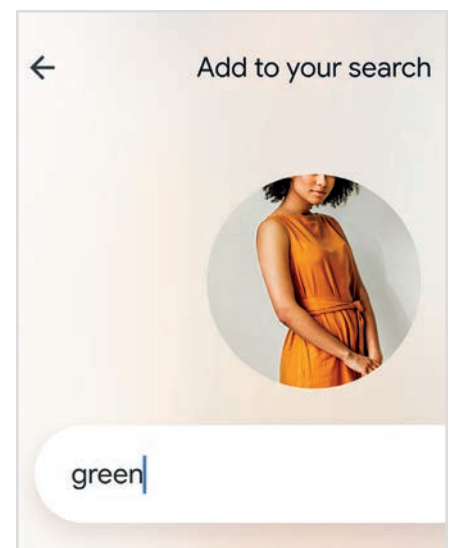
Our mission to organize the world's information and make it universally accessible and useful remains central to how we build our products. In 2022, we worked to advance knowledge and computing, drawing on AI to build products that are more accessible and helpful for everyone, everywhere.

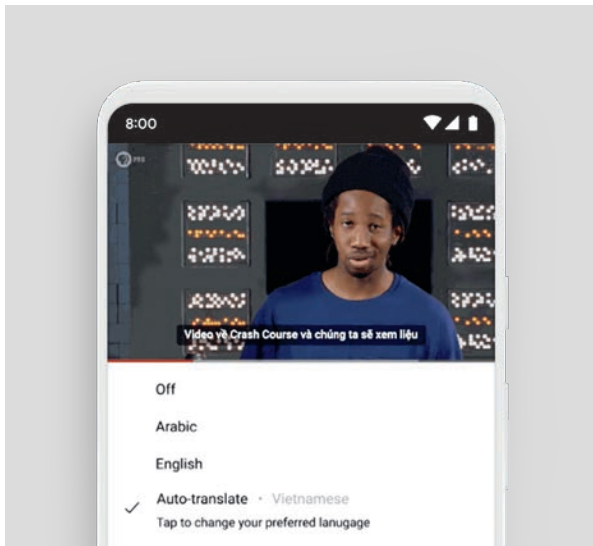
Information is only as useful as it is easy to access, so we continued to make Search and YouTube as intuitive as possible. We launched multisearch, a way of searching with both images and text at the same time using AI. With Google Lens, you can take a photo of the tomato plant in front of you and add "care instructions" to quickly learn how to nurse the plant back to health. On YouTube, people are often searching for a specific moment in a video, and with the launch of auto-generated chapters, it's easier to jump straight to the point they need.



Multisearch

With multisearch, people can now search with both images and text at the same time in Google Lens.

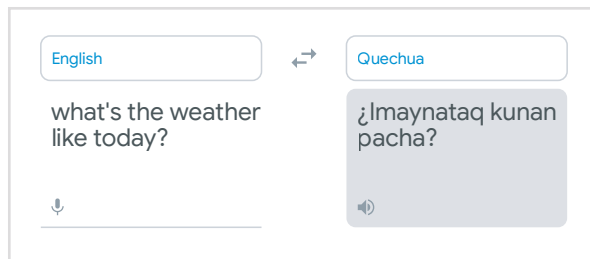




Auto-translate

Auto-translated captions on YouTube enable viewers to translate content into 16 different languages.

We are also expanding people’s ability to access information in multiple languages whenever they need it. Drawing on speech recognition models, we’ve made video transcriptions available for all Android and iOS users, and with auto-translated video captions in 16 languages on mobile, it’s easier for global audiences to access information. More people are using Google Translate than ever, but adding languages that are underrepresented online has historically been a challenge. With AI-powered machine learning advances, we developed a monolingual approach where the model learns to translate a new language without ever seeing a direct translation of it. As a result, we were able to add 24 new languages to Google Translate, including Ewe (spoken in West Africa) and Quechua (spoken in South America); collectively, those languages are spoken by more than 300 million people.



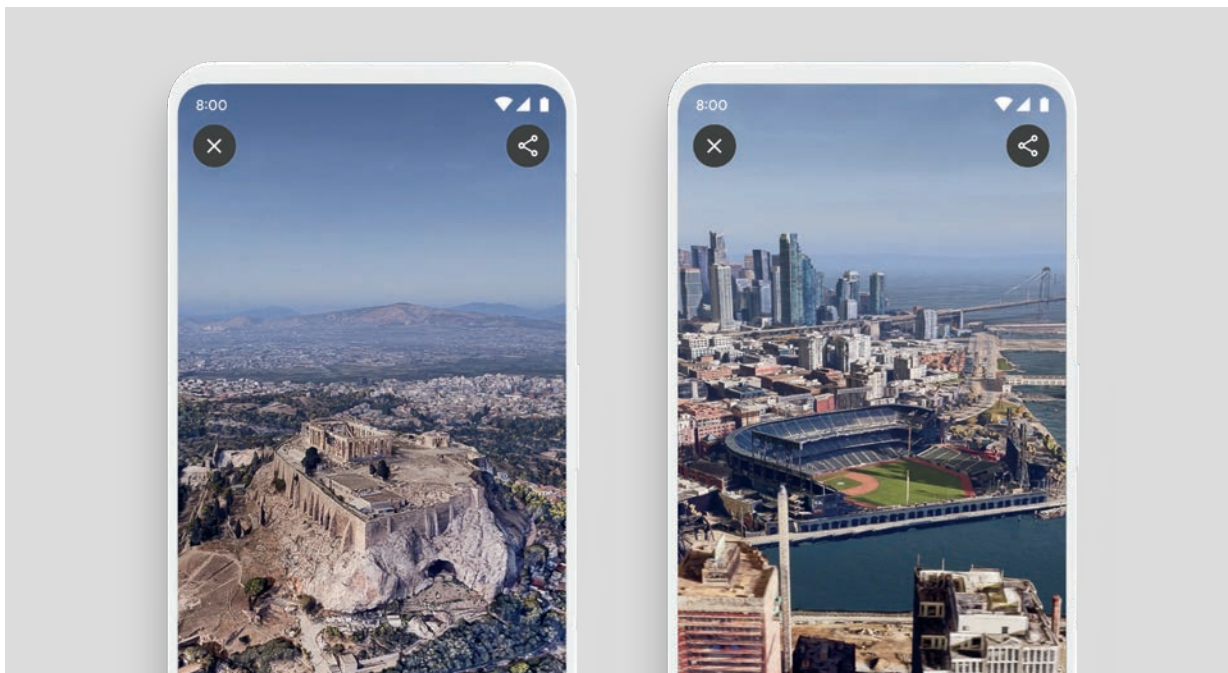
Access to more languages

Machine learning advances enabled us to add 24 new languages to Google Translate, including languages that are underrepresented online like Quechua.

Making information accessible and useful also means ensuring it helps people during the pandemic. We delivered on our commitment to providing timely, accurate information with a number of new features across our products. Searches for “at home COVID tests” increased by 170% so we added new features to Search to help people quickly find at-home testing kits available in stores and nearby testing information provided by local health authorities. In our effort to amplify trusted information, we pledged an additional \$150 million in donated Search ads to connect people with authoritative COVID-19 information as they searched, bringing our total in-kind commitment to more than \$1 billion. In Japan, Brazil, and India we launched new health source information panels on YouTube to help viewers identify videos from authoritative sources and health content shelves.

In Maps, it has always been our aim to offer the most intuitive representations of information to help people navigate. With new updates, Maps feels more and more like the real world. The AI behind Maps keeps pace with how communities are changing, automatically updating things like business hours and speed limits. With immersive view, you can now see photorealistic multidimensional views of more than 250 global landmarks like Big Ben or the Acropolis.

To help people plan their visit, weather, traffic, and busyness information are layered on top, and predictive modeling anticipates what the next day or week might be like. Thanks to a combination of AI and contributions from Maps users, the new neighborhood vibe feature shows an area's most popular spots with photos and helpful information to give people a feel for where they might explore.



Immersive view

Google Maps now features immersive view, enabling users to explore 250 global landmarks like the Acropolis in Athens, Greece, and Oracle Park in San Francisco through multidimensional photorealistic views.

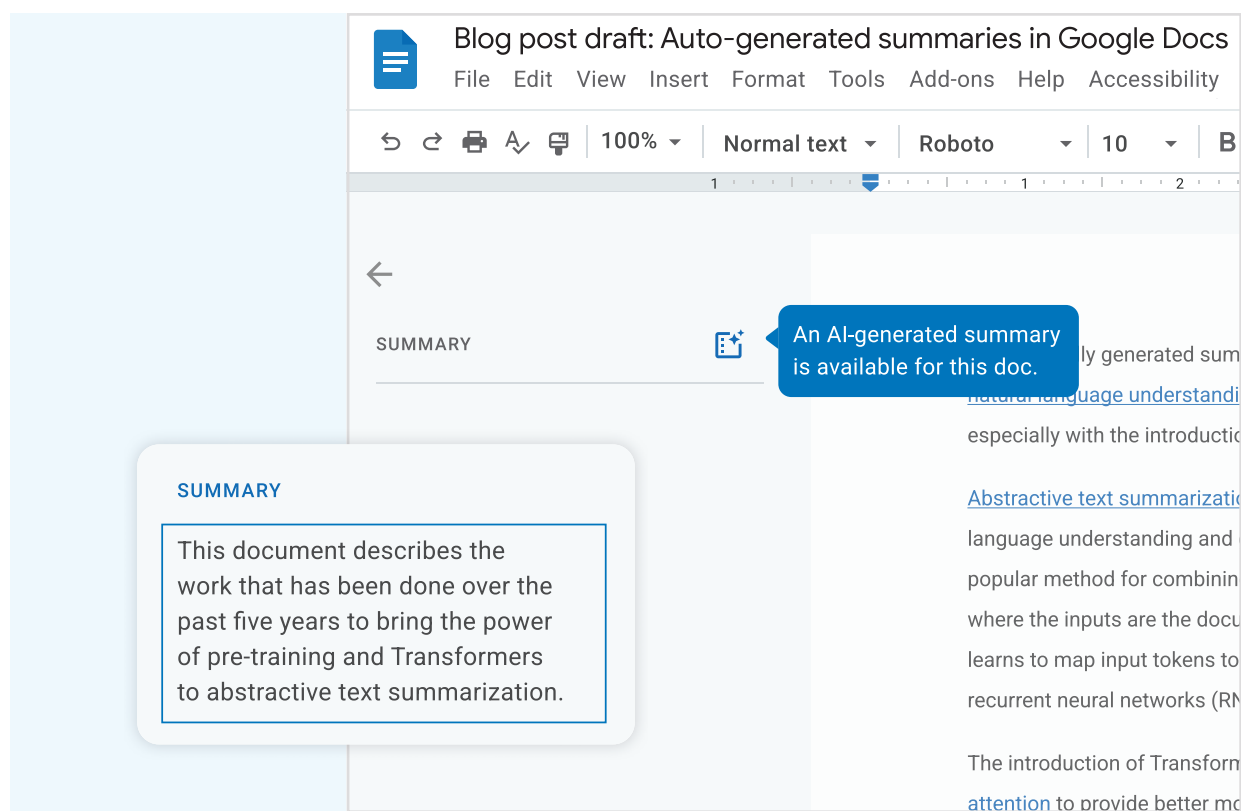


Mapping remote areas

We've mapped around 1.6 billion buildings and over 60 million kilometers of roads in Google Maps, and with advances in AI, we're able to map remote and rural areas.

Just as we want to help people navigate the physical world, we also want to connect them virtually. As offices reopened and organizations adapted to the hybrid workplace, Workspace helped to boost collaboration and productivity. Using AI, we built a machine learning model for text summarization in Google Docs. With automated summaries distilling

the content, people can quickly gather the main points, a significant step for our natural language processing capabilities in Docs. With image processing powered by machine learning, Meet now automatically improves image quality so we can see one another as vividly as possible.



AI-generated summaries

Automated summaries generated by AI help users quickly grasp the main points of documents in Docs.



Google Pixel Watch

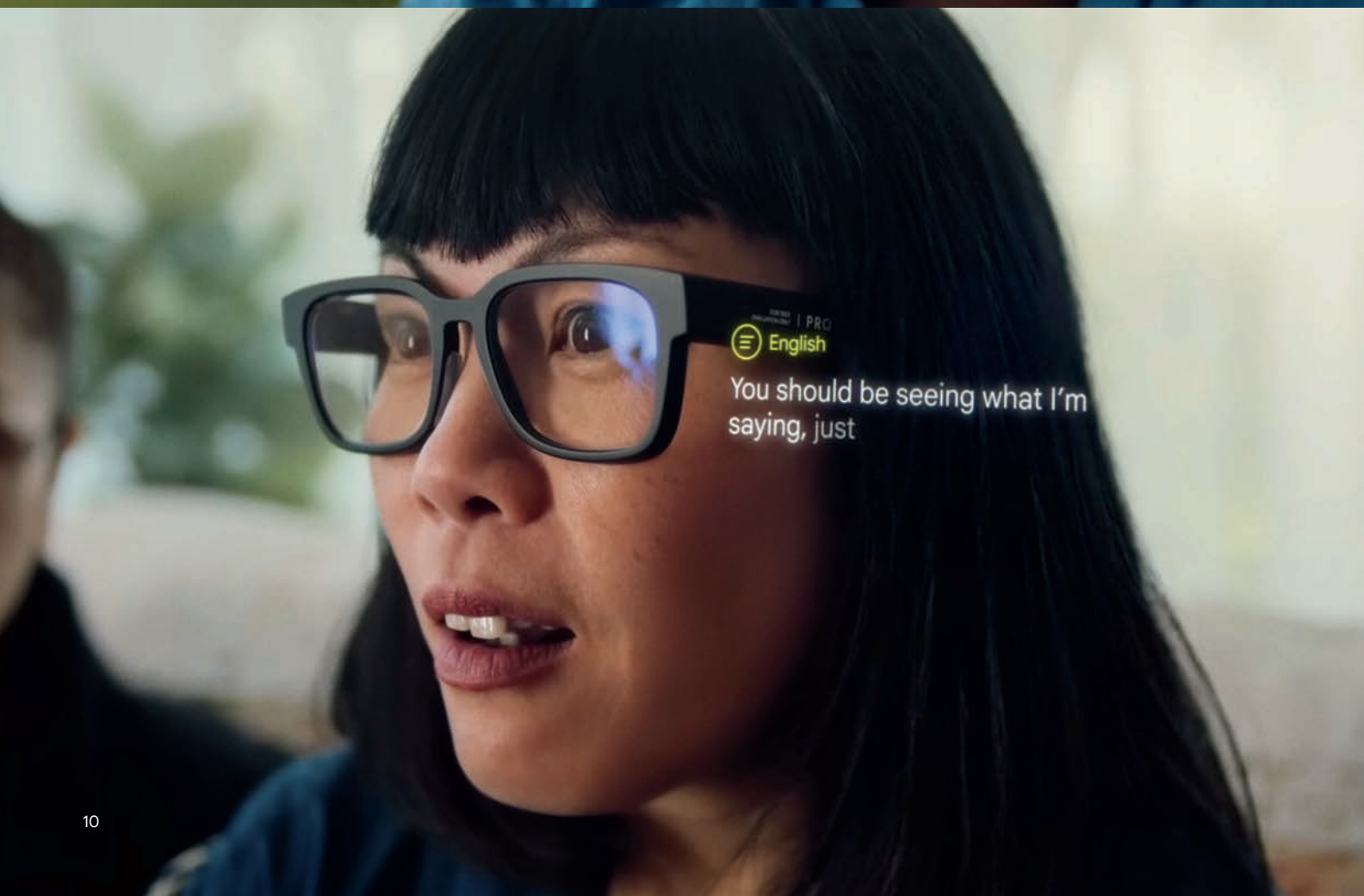
The Google Pixel Watch – our first watch built inside and out – combines helpfulness and convenience and works seamlessly with the Pixel family of devices.



True helpfulness requires technologies that work seamlessly together. We released a family of Pixel devices to deliver a personal, intelligent, cohesive experience like never before. We unveiled our first smartwatch, the Google Pixel Watch, and launched the Pixel 7 and Pixel 7 Pro phones, powered by our custom Tensor G2 processor. We also unveiled the

Pixel Buds Pro, our premium earbuds that deliver truly immersive sound. Together, these devices adapt to your needs to deliver helpfulness each day. With a full lineup of Fitbit trackers and smartwatches tailored to different health and fitness needs, we released new ways to empower people to stay on top of their wellness.

Language models and translation are areas where Google has seen enormous potential for AI. When implemented through augmented reality to break down communication barriers and make language visible (illustrated here using Google Translate on prototype glasses), they can have a dramatic impact on daily life.





 Inglés

De hecho, estoy mirando
directamente a tus ojos, y
parece que estas mirando
directamente

Simulated point of view

“I have to talk with lots
of people who only
speak English. This
is like magic to me.”

– Guillermo, research participant

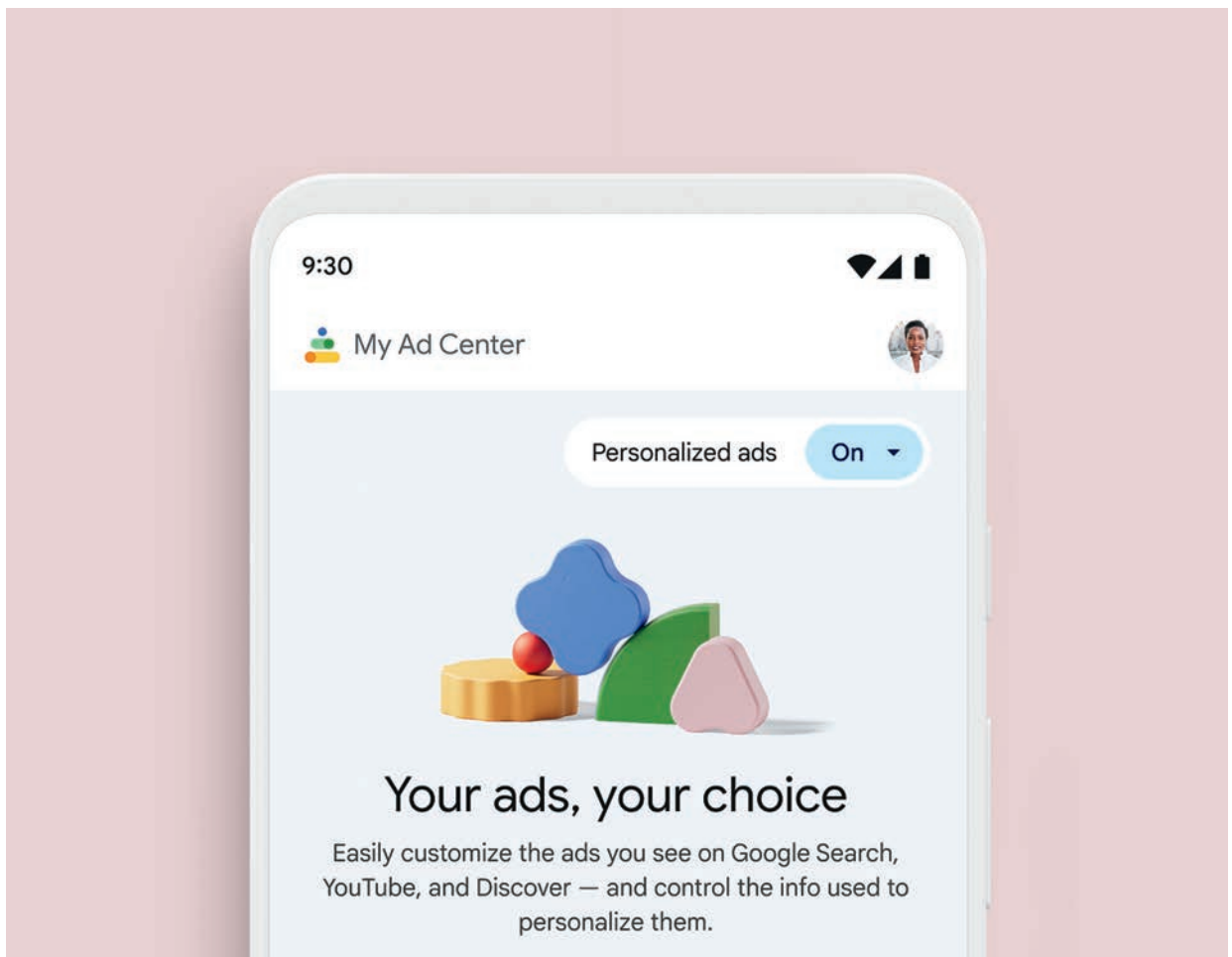
This device has not been
authorized as required by
the rules of the Federal
Communications Commission.
This device is not, and may
not be, offered for sale or
lease, or sold or leased, until
authorization is obtained.

Year in Review 2022

Building trust by building a safer digital world

With a security infrastructure built into our products, we work to keep people safe at scale and help them feel confident as they navigate their digital world. In 2022, we shared a new account safety status feature across our apps to flag action that needs to be taken to further secure Google Accounts; continued our work toward a passwordless future with passkey, a new credential to unlock your account; and made updates to resources like virtual cards and SafeSearch to protect payment information and help filter explicit content for families.

Google has always provided a secure cloud infrastructure, with more than 6 million websites protected from fraud and bots by our cybersecurity technology. We strengthened our leadership in this area with the acquisition of Mandiant, adding industry-leading threat intelligence and incident response capabilities. In 2022, Mandiant helped more than 1,800 customers prepare for or recover from critical cybersecurity incidents.



My Ad Center

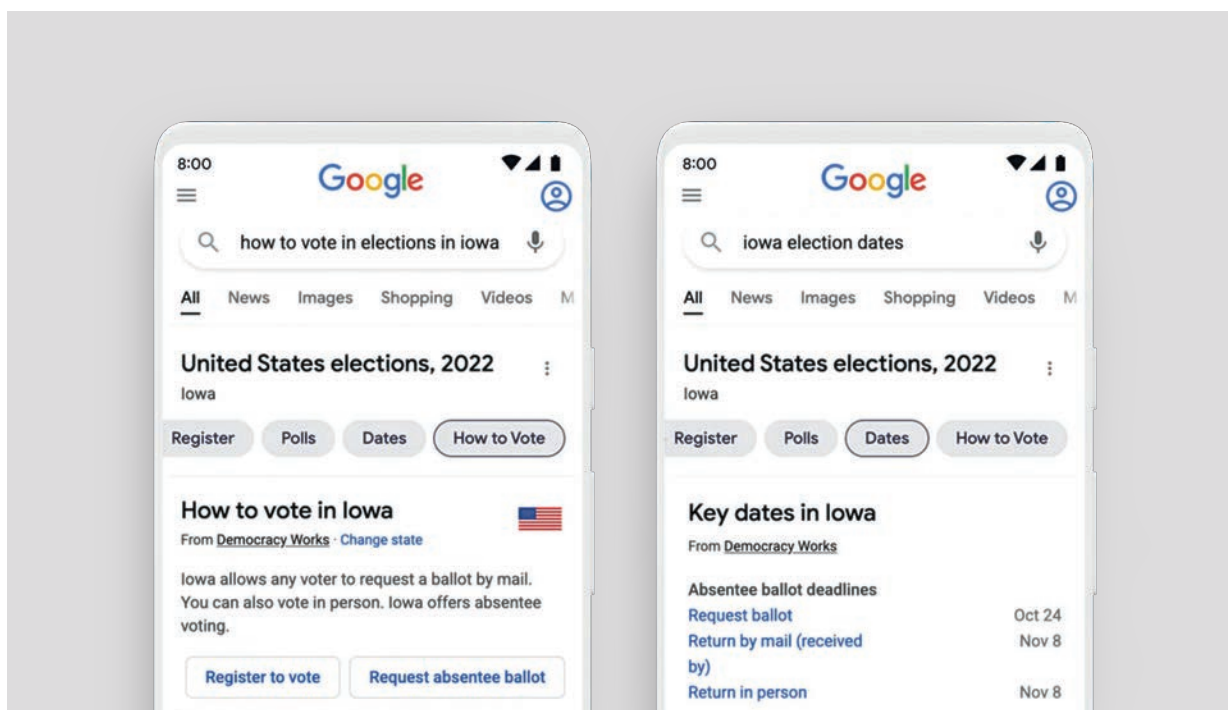
Users' data are theirs to control, and in My Ad Center, they can learn more about the information used to serve them ads; with "Customize Ads," they can choose the topics and brands they want to see more or less of.

Protecting privacy is essential to online safety, and we've open-sourced privacy-preserving technologies that we pioneered, including federated learning and differential privacy, to make them accessible to developers everywhere. Building upon that work, we introduced Protected Computing, a growing toolkit of technologies that transform how, when, and where data are processed to ensure the privacy and safety of your data by minimizing your data footprint, de-identifying data, and restricting access to sensitive data.

Online safety also includes having control over personal information. We've updated our removal policies and introduced a new tool to make it easier to request the removal of Google Search results, including your contact details such as phone number, home address, and email addresses. We also launched My Ad Center to give users more control over the types of ads they see on YouTube, Search, and their Discover feed.

2022 was another year of critical elections happening worldwide. Helping voters everywhere find election information and protecting the accounts of campaigns and election officials was paramount. In the U.S., we launched a new feature to help readers discover local and regional news from different states so they could better understand election coverage of the races they most care about. Through our Campaign Security Project and partnership with Defending Digital Campaigns, we teamed up with organizations across the political spectrum to train more than

5,500 campaign and election officials in the U.S. on security best practices, including products and tools they can use to stay safe online. Globally, we worked with organizations like the International Foundation for Electoral Systems (IFES) to help enhance the security of campaigns and affiliated high-risk users. We also made significant investments in enhancing transparency around election advertising, including a new user interface for our Political Ads Transparency report, enabling a more granular breakdown of advertising data.



Election information in Search

To help voters easily access useful, relevant, and accurate information in the run-up to elections, features in Search shared data from nonpartisan organizations and essential information on topics like voter registration and how to vote.



Anticipating risks

The “Hacking Google” series on YouTube provides a behind-the-scenes perspective on our hacking teams like the Threat Analysis Group, which keeps more people safe online than any other organization in the world.



Supporting Ukraine

Vice Prime Minister of Ukraine Mykhailo Fedorov visited the Google offices in Washington, D.C., to discuss the challenges his country is facing and ways to extend Google’s help, including fighting misinformation.

Fighting misinformation is core to our mission, and it became especially important among our efforts to support Ukraine. People in affected areas turned to Search to find the latest news and information on where to find shelter and aid, so we donated Search advertising for humanitarian relief. To help ensure reliable access to trustworthy information, we introduced new features, including information

panels in local languages and transparency labels for publisher content on YouTube to provide additional context for the information people encountered. As disinformation and misinformation about Ukraine spread, we pledged more than \$10 million to support partnerships with think tanks and civil society organizations to conduct region-specific research and cash grants for fact-checking networks and nonprofits.

Helping our customers and partners evolve and grow

Our growth and success are made possible only when we can help our partners succeed. Between 2019 and 2022, we contributed more than \$200 billion to key ecosystems, including Google Play developers, online publishers, YouTube creators, artists, and media organizations. We continued to empower our customers and partners by delivering the technology and support they needed to navigate a rapidly changing landscape with confidence.

Across our platforms, people are shopping more than a billion times a day. Whether they are planning to shop online or in store, we're investing in making the experience as easy, helpful, and engaging as possible. Shoppers searching for anything from apparel to home goods to electronics will experience a more visual content stream, allowing them to discover, browse, compare, and research the best product for them. What's more, if they're shopping for sneakers, beauty products, or home furnishings, shoppers can now "try before you buy" right in Google Search with AR tools that let you experience products in a more lifelike way. It was also crucial for us to help businesses reach shoppers at the right moments, and with Performance Max, our AI-powered, goal-based campaign type, Local and Smart Shopping campaigns were optimized to help businesses reach new and existing customers wherever they were in their journey with relevant, useful content.

Our AI breakthroughs enabled a number of improvements to make our Ads work harder for businesses. For instance, with Smart Bidding we use AI to predict future ad conversions and their value, helping businesses anticipate and quickly respond to rapid shifts in demand. Additionally, our large language models like MUM have enabled us to increase understanding of intent behind language, leading to more precise search-query matching with advertiser offers. As a result, when businesses use Smart Bidding and upgrade exact match keywords to broad match in campaigns that use a target CPA, they can see an average of 35% more conversions.

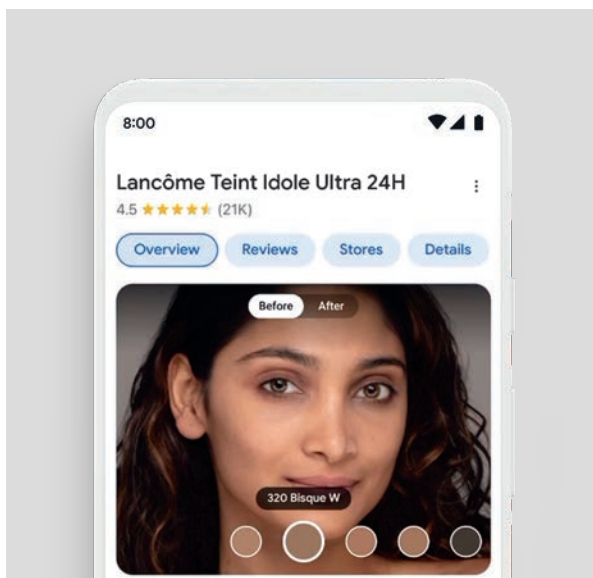
YouTube Shorts has quickly become a vibrant experience – particularly among Gen Z creators and viewers – reaching 1.5 billion users each month and 30 billion daily views in 2022. Ads launched on Shorts with Video Action, App, and Performance Max campaigns available, creating new opportunities for advertisers to reach their audiences. We also announced the extension of the YouTube Partner Program to bring revenue sharing to Shorts, making YouTube the only ecosystem where creators can monetize their content across short, long, and live formats at scale. Our aim is to provide creators with the best content creation and analytics tools, making it easier for them to expand their earning potential.

Google Cloud helps us share our innovations with companies, governments, and organizations around the world. Through Google Workspace, we delivered more than 300 new capabilities to support hybrid and front-line work, including AI-powered features to automate transcriptions and extend the power of smart canvas. We are proud that more than 9 million businesses and organizations worldwide rely on Google Workspace for communication and collaboration.

Beyond Workspace, customers like Ford and Rite Aid turn to Google Cloud because we offer a single platform that can analyze data across any cloud, and our reliable, open infrastructure creates a valuable pathway to reduce IT costs and accelerate digital transformation. In 2022, we also deepened and expanded relationships with existing customers, like Kraft Heinz, Deutsche Bank, and Sony's Crunchyroll, helping bring together the best across Google to build solutions tailored to their industries. For example, Renault Group partnered with Google, harnessing Google Cloud and Android products, to accelerate its end-to-end digital transformation, from the design of the car to its production and market launch.

2022 marked the 10th anniversary of Google Play, which has grown to be a flourishing app ecosystem attracting 2.5 billion people each month, thanks to the creativity and partnership from developers. To support developers, we launched several new features like custom store listings, a new way to reach a specific segment of people with messaging relevant to them, so they can expand their businesses more effectively and efficiently.

Supporting a sustainable, diverse, and innovative news ecosystem is critical to our mission. Communities around the world rely on local news to thrive and stay connected. More than 90% of the publications that are part of the Google News Showcase, our curated online news experience and licensing program, represent local, community, and regional news. We've also made improvements to our products to give their content even greater visibility. Now News Showcase publishers can pick the most important stories from their area for panels that will appear in the local section of Google News, immediately connecting readers with the latest news from their community.



Try it on with AR

Using AR, anyone can now virtually try makeup products and find their perfect match right from the Google app.



YouTube Shorts

YouTube Creator Liaison Rene Ritchie shared the news that YouTube Partner Program profit sharing had come to Shorts, giving creators a new revenue stream.



“The most incredible thing is how Google Play helped us to spread the game. So many people all over the world now know ÁRIDA, and we are really grateful for that.”

Through gaming, Filipe Pereira saw the potential to share Brazil's heritage with the world. He and his business partner built Aoca Game Lab, which launched their first title on mobile, ÁRIDA: Backland's Awakening, a survival game following the adventures of a young girl in the historic town of Canudos, Brazil. A recipient of Google Play's Indie Games Fund, Filipe got the resources to take the game and his studio to the next level.

Our commitments

Through our products, partnerships, and investments we aim to bring essential help to people, businesses, and communities. We acted on that ambition by focusing on areas where help is needed most: supporting economic resilience, advancing equity and inclusion, and taking on the climate crisis.

Supporting economic resilience for people, communities, and businesses

Economic uncertainty in 2022 brought significant tests for job seekers, businesses, and communities, and we sought to provide the support and opportunities to clear the path ahead. Small businesses continued to be disproportionately impacted by the ongoing upheaval, having to adapt to substantial shifts and the new challenges that came with a return to in-person experiences. In the U.K., 60% of small- and medium-sized enterprise (SME) owners believe they are operating in a post-pandemic “new normal,” with customer and employee expectations dramatically altered, and 63% say that digital skills and tools are now more important than they were pre-pandemic. Through the Google Digital Garage, those small businesses can access training in essential online skills, and we expanded the program to include

in-person training on topics like “Digital Marketing Strategy” and “Coding” as well as one-to-one mentoring with digital experts.

For job seekers, finding opportunities often meant expanding their skill set to keep pace with the demands of a shifting job market. In the U.S., nearly two-thirds of workers do not have a four-year college degree, which means about 70 million Americans are locked out of high-growth, high-earning career paths¹. The Career Certificates program provides training for careers like data analytics, digital marketing and e-commerce, IT support, project

1. “Educational Attainment in the United States: 2021,” Census Bureau, February 2022.



Empowering small businesses

U.K. Prime Minister Rishi Sunak (then chancellor) joined Google in Ipswich, England, to launch the next phase of our in-person Google Digital Garage skills training, along with new support via Google Career Certificates to help small businesses.



Expanding CS education

Alphabet and Google CEO Sundar Pichai met with Ian Bundy-Weiss, an alum of The Hidden Genius Project, a nonprofit that provides Black male youth with technology, entrepreneurship, and leadership training. The organization is one of the recipients of support from Google's \$20 million commitment to expand access to computer science education.

management, and user experience design. In the U.S., more than 150,000 people have now completed these certificates, and 75% of them report a positive career impact within six months, such as a raise or new job. But expanding access to the program where it's needed most is still an urgent priority. To that end, we announced a \$100 million Google Career Certificates Fund to support Social Finance, a national impact finance and advisory nonprofit helping more than 20,000 workers in the U.S. take a certificate with wraparound career support – with the potential to result in \$1 billion in aggregate wage gains. To help prepare people for their future careers early on, we also announced a \$20 million commitment to expand computer science education access to more than 11 million students across the U.S.

As a global company endeavoring to provide access to information and technology for each and every person, supporting the digital transformation of developing economies is an essential priority. Delivering on our \$1 billion investment in Africa's digital transformation, we helped job seekers and entrepreneurs access more opportunity through Development Scholarships, Career Certifications, and digital training for small businesses. In Latin America, we announced a five-year, \$1.2 billion commitment to the region focused on building digital infrastructure, digital skills, entrepreneurship, and inclusive, sustainable communities to help accelerate their digital transformation.

“Last year, I graduated with the Google IT Support Certificate. Before that, I was self-employed for about 13 years, and I’d never really done any interviews. It’s a very anxious feeling ... you’re learning to answer these questions in a much more professional way. Big confidence boost.”

Interview Warmup is a tool we launched that makes it easier to practice for an interview and grow comfortable with the interview process. Answers to practice questions are transcribed in real time alongside insights (patterns detected by machine learning) to help job seekers prepare, such as job-related terms they use, the words they say most often, and the different talking points they cover. Interview Warmup helped Le’Mont Calhoun, a Google Career Certificates graduate, prepare with confidence and ultimately land a new job.



Advancing equity and inclusion



Supporting one another

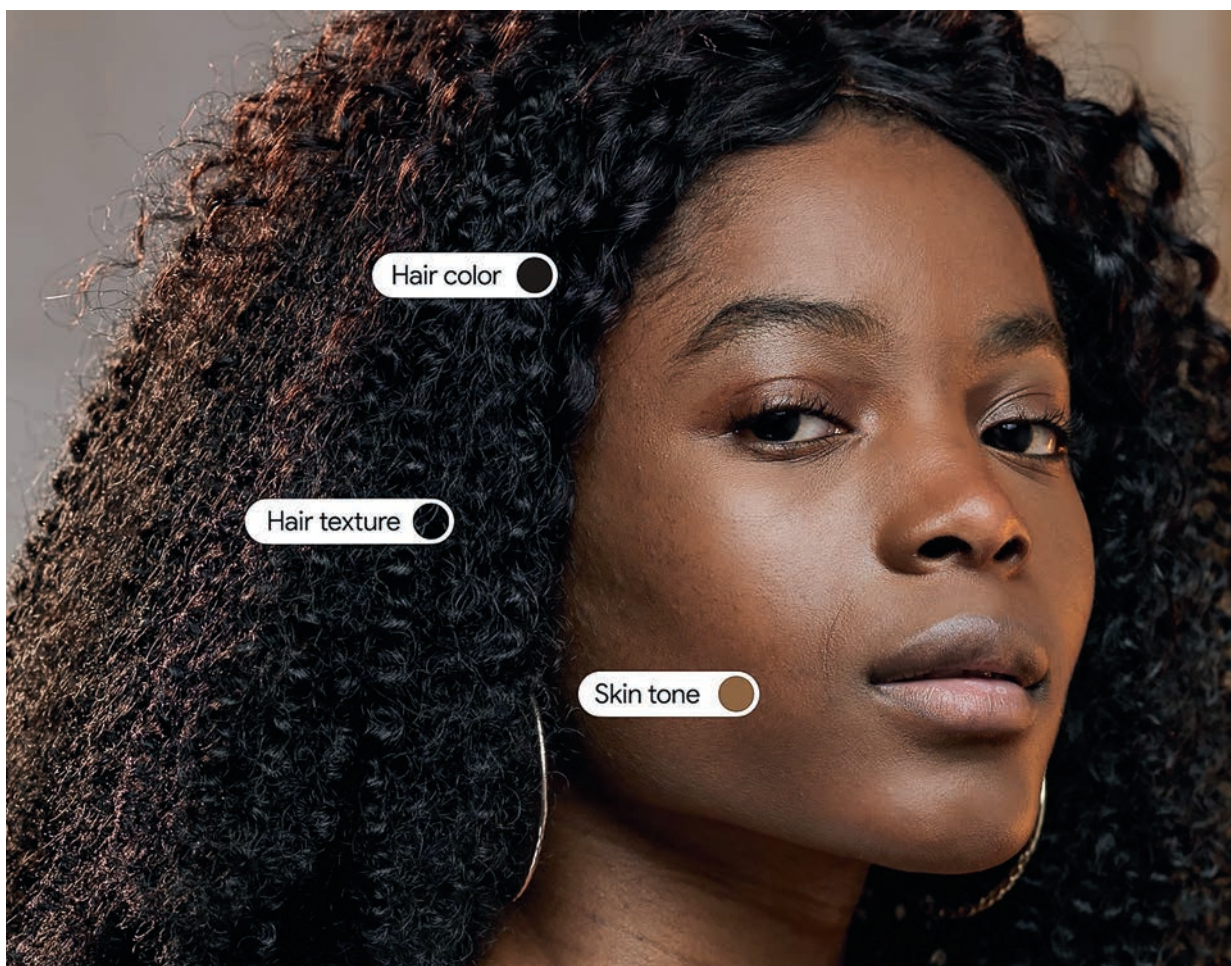
Fei Zou, software engineer, co-leads the Disability Alliance internal resource group in China. Together, they have created a space to help address challenges Googlers with disabilities face and build allyship.

One of our central tenets is to build belonging for everyone at work, in our products, and in society. Our ability to do that starts with building a fair, inclusive, and representative workplace. In May, we released updates on our progress in our 2022 Diversity Annual Report (DAR), reflecting 2021 gains. The report showed our best hiring year for women globally, as well as our largest gains in representation of Black+ and Latinx+ Googlers in the U.S. Still, our work to build a workforce that is a reflection of society's diversity is far from done.

We want to help build an economy that works for everyone. As a result, we set a 2022 goal to grow our Supplier Diversity impact by spending \$2.5 billion with diverse suppliers, while expanding the program to include suppliers from historically underrepresented groups around the world; we exceeded our goal by spending \$2.8 billion. We also deepened our partnerships with nonprofit and community organizations to further expand access to educational and career opportunity, including a \$5 million Google.org grant to Spelman College's Center of Excellence for Minority Women in STEM to help build the first database on the experiences of women from historically underrepresented groups in STEM.

We also continued to bring improvements to our products to help them work better for everyone. For people with disabilities, speech recognition is an increasingly important dimension of how people interact with technology, and in 2022, we joined the Speech Accessibility Project, a collaboration between researchers at the University of Illinois Urbana-Champaign and five technology companies. The university is working with advocacy groups, like Team Gleason and the Davis Phinney Foundation, to create data sets of impaired speech that can help accelerate improvements to automated speech recognition (ASR), a key step toward supporting more than 1.5 billion people who are hearing impaired worldwide.

Each year we seek ways to make sure our products represent our world. In 2021, we launched Real Tone for Pixel – technology to capture and create more accurate images of people of color – and in 2022, we built on that work by adopting the Monk Skin Tone Scale. This tool, created by Harvard professor Dr. Ellis Monk, offers a broader spectrum of skin tones to inform the technology development process. Beyond Pixel, we started using it to achieve more equitable representation in Search, Google Photos, and more.



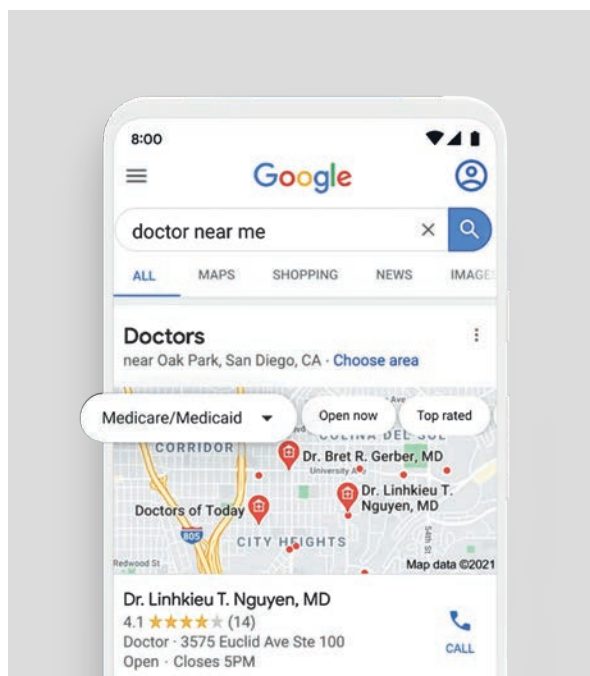
Monk Scale

The Monk Skin Tone Scale offers a broader range of skin tone shades than is typically used in technology development, helping us build products that better reflect the spectrum of skin tones we see in the world.



NBA HBCU Fellowship Program

With support from Google, the NBA Foundation's NBA HBCU Fellowship Program provides career development opportunities in basketball for students at Historically Black Colleges and Universities like Aniya Mahaffey, a student at North Carolina Central University.



Medicare/Medicaid Search filters

To help Medicare and Medicaid participants easily access information most relevant to them, Search filters can show them nearby health care providers that accept Medicare and Medicaid.



“Every voice we add enriches it.
And every voice we lose diminishes it.”

Laurence Moroney is a developer advocate at Google focusing on artificial intelligence (AI) and machine learning (ML). He focuses on inviting and introducing more people to roles in the AI and ML fields through coursework, workshops, and boot camps that help developers gain job skills. He says, “A cynical person might say businesses just want to check off diversity boxes, but for us, it’s not a box to check. It’s a huge opportunity for what we’re creating to be so much better.”

Taking on the climate crisis

The climate crisis remains humanity's greatest collective challenge, and we build sustainability into our operations, products, partnerships, and investments. Our goal to operate our data center and office campuses on 24/7 carbon-free energy by 2030 remains one of our greatest ambitions, and we have made significant progress – this is part of our broader goal to achieve net zero emissions across our operations and value chain, including consumer hardware products, by 2030.

To expand access to clean energy, we supported clean energy projects, including new solar and wind projects in the U.S., U.K., Denmark, Spain, Finland, and Chile. To ensure we're optimizing our operations, we use AI technology to shift flexible compute tasks at our data centers across time and space to better align with lower-carbon hours on the grid, using our carbon-intelligent computing platform. We advanced the development of time-based energy attribute certificates (T-EACs), a tool to enable clean energy production, consumption, and trading to be tracked on an hourly basis.

We also unveiled a number of new features across our products to help people make environmentally conscious choices each day. For enterprise customers, Google Cloud launched a pilot program to help customers transition to clean energy by building a clear picture of their electricity emissions profile using AI-generated historical and real-time insights. In Maps, we expanded cycling navigation guidance with new information to easily compare bike routes and get granular details about the route (where data are available) to prepare for the ride ahead. People can now also find sustainable hotel options with the "eco-certified" filter, with each hotel offering details on their practices like waste reduction or sustainable sourcing, and they can compare flight emissions for similar trips in Google Flights. Anticipating environmental risks is a critical challenge; we globally launched FloodHub, an AI-powered platform that displays flood forecasts and shows when and where floods may occur to help organizations prepare.

To help maximize the life of our hardware and reduce e-waste, we made it simpler for anyone to repair, return, or recycle their Pixel phone. People in the U.S., U.K., Canada, Australia, and EU countries where Pixel is available can now find spare parts for many of our older Pixel models through Pixel 7 Pro and future Pixel models on [ifixit.com](https://www.ifixit.com). With our recycling program, people can mail in their old or unused devices, and we'll responsibly recycle them.



Our Startups for Sustainable Development program has broadened its reach.

400
startups
supported

70
countries

150
partner
organizations
networked

Cleaner performance

As part of Google's progress toward operating 24/7 on carbon-free energy, we have developed new cooling solutions, including a low-water alternative that can reduce a data center's water use by as much as 50% while preserving efficiency.



Sustainable startups

The Startups for Sustainable Development program provides long-term support for new ventures like Earthly, a startup with a mission to help businesses remove at least one billion tons of carbon by 2030.



Local ecology

Google's real estate and ecology teams collaborate to bring nature back into the built environment on our campuses. Here, two members of the ecology team walk along a path between native plants in the South Bay campus.

“We just don’t have the same climate we used to. Technology allows us to continue to push forward so the vineyards will outlast us.”

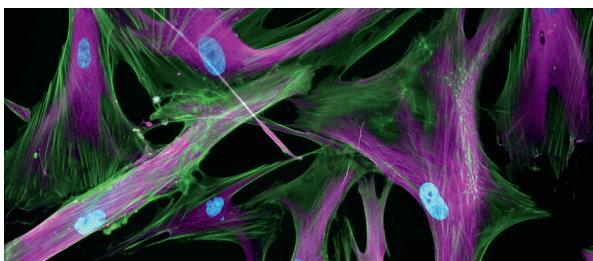
– Riggs Lokka, Emeritus Vineyards

Adam Koeppel and Tyler Locke co-founded Agrolgy to help farmers adapt to changing climates. Using Google Cloud with TensorFlow, public benefit corporation Agrolgy runs machine learning models on sensor data to provide predictive insights for growers like multigeneration Emeritus Vineyards.



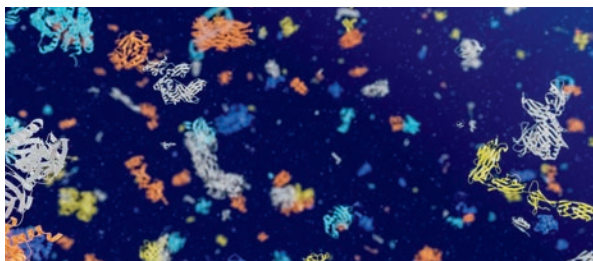
Other Bets

Across our Other Bets, we made ambitious strides in using technology to take on today's greatest challenges and opportunities.



Calico

In collaboration with AbbVie, Calico began testing an investigational drug treatment in patients with amyotrophic lateral sclerosis (ALS). Together, Calico and AbbVie are working to discover and develop potential new therapies for patients with age-related diseases, including neurodegenerative disorders.



DeepMind

AlphaFold, DeepMind's AI system to predict the 3D structure of a protein just from its 1D amino acid sequence, reached a significant milestone. In partnership with the European Bioinformatics Institute, DeepMind released predicted structures for nearly all proteins known to science through the AlphaFold Protein Structure Database, advancing the world's understanding of biology.



Wing

Setting the foundation for scalable drone delivery, Wing expanded operations across three continents – launching the first commercial drone delivery service in a major U.S. metro region in the Dallas/Fort Worth area with Walgreens – and brought on new partners, including DoorDash and Coles.



Waymo

In 2022, Waymo continued to expand its rider-only service, driving fully autonomously across all of San Francisco and beginning to open up its fully autonomous service in San Francisco to public riders. Waymo also expanded its public service into downtown Phoenix and introduced the first autonomous airport service in the world at Phoenix Sky Harbor. In Los Angeles, Waymo began testing and will serve riders there in the future as the company's third ride-hailing city.

Conclusion

2022 was a year that affirmed that helpful technology and access to knowledge can make a meaningful difference in people's lives. We believe that the world is on the cusp of great opportunity in AI. This inspires us and fuels our commitment to deliver the technology to help make it happen.

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, 2022

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____.

(Exact name of registrant as specified in its charter)

(State or other jurisdiction of
incorporation or organization)

(Address of principal executive offices, including zip code)
(Registrant's telephone number, including area code)

Commission
file number:

(I.R.S. Employer
Identification No.)

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.	☒	☐
• if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.	☐	☒
• 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.	☒	☐
• 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).	☒	☐
• 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 ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐		
• 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.		☐
• 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.		☒
• If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements.		☐
• whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b).		☐
	YES	NO
• whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).	☐	☒

As of June 30, 2022, 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, 2022) was approximately \$1,256.1 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 26, 2023, there were 5,956 million shares of Alphabet's Class A stock outstanding, 883 million shares of Alphabet's Class B stock outstanding, and 5,968 million shares of the Alphabet's Class C stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the 2023 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, 2022.

Alphabet Inc.
Form 10-K
For the Fiscal Year Ended December 31, 2022

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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 growth of our business and revenues and our expectations about the factors that influence our success and trends in our business;
 - fluctuations in our revenues and margins 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 revenues, 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 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, including the possibility that certain legal proceedings to which we are a party could harm our business, financial condition, and operating results;
 - our expectation that we will continue to face heightened regulatory scrutiny, and the sufficiency and timing of our proposed remedies in response to decisions from the European Commission (EC) and other regulators and governmental entities;
 - the expected timing, amount, and effect of Alphabet Inc.'s share repurchases;
 - our long-term sustainability and diversity goals;
 - the unpredictability of the ongoing broader economic effects resulting from the war in Ukraine on our future financial results;
 - the expected financial effect of our announced workforce reduction and office space optimization;
 - our expectation that the change in estimated useful life of servers and certain network equipment will have a favorable effect on our 2023 operating results;
- 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. 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, such as our long-term opportunities in artificial intelligence (AI). We continue this work under the leadership of Alphabet and Google CEO Sundar Pichai.

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. 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. Google Search helps people find information and make sense of the world in more natural and intuitive ways, with trillions of searches on Google every year. YouTube provides people with entertainment, information, and opportunities to learn something new. 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. Google Cloud helps customers solve today's business challenges, improve productivity, reduce costs, and unlock new growth engines. We are continually innovating and building new products and features that will help our users, partners, customers, and communities and have invested more than \$100 billion in research and development in the last five years in support of these efforts.

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

We believe that AI is a foundational and transformational technology that will provide compelling and helpful benefits to people and society through its capacity to assist, complement, empower, and inspire people in almost every field of human endeavor. As an information and computer science company, we will continue to be at the forefront of advancing the frontier of AI. Through our path-breaking and field-defining research and development, we responsibly and boldly develop more capable and useful AI every day.

AI already powers Google's core products that help billions of people every day and has been at the foundation of our core ads quality systems for years, helping large and small businesses all over the world to produce and run effective and efficient ad campaigns that help grow their businesses. AI makes it possible to search in new languages, with multiple inputs, such as using images and text at the same time with the Google App. Some of our most popular products at Google — including Lens and Translate — were built entirely using artificial intelligence technologies such as optical character recognition and machine learning. Google Cloud continues to build AI into numerous solutions that our customers can use to develop AI-powered applications — including processing documents, images, and translation — to understand and analyze data more efficiently, and to use packaged solutions for a variety of industries. In all these examples, AI significantly enhances the usefulness and multiplies the value of these products and services to people and organizations.

Our view is that AI is now, and more than ever, critical to delivering on our mission. As we bring our breakthrough AI innovations into the real world to assist people and benefit society everywhere, we are also pursuing further advancements that will help to unlock scientific discoveries and to tackle humanity's greatest challenges and opportunities.

Privacy and security

We make it a priority to protect the privacy and security of our products, users, and customers, even if there are near-term financial consequences. We do this by continuously investing in building products that are secure by default; strictly upholding responsible data practices that emphasize privacy by design; and building easy-to-use settings that put people in control. We are continually enhancing these efforts over time, whether by enabling users to auto-delete their data, giving them new tools, such as My Ad Center, to control their ad experience, or advancing anti-malware, anti-phishing, and password security features.

Google

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

Google Services

SERVING OUR USERS

We have always been committed to building helpful products that can improve the lives of millions of people worldwide. Our product innovations are what make 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, 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 or mobile device, their own voice, a photo, or an image, making it quicker, easier, and more natural to find what they are looking for. Of the searches we see every day, 15% are new.

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. People are consuming many forms of digital content, including watching videos, playing games, listening to music, reading books, and using apps. 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 the new Pixel 7 and Pixel 7 Pro, and the very first Pixel Watch. Creating products that people rely on every day is a journey that we are investing in for the long-term.

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 focus on growing revenues beyond advertising, from Google Play, hardware, and YouTube subscriptions, such as:

- **Google Play** generates revenues from sales of apps and in-app purchases.
- **Hardware** generates revenues from sales of Fitbit wearable devices, Google Nest home products, and Pixel devices.
- **YouTube non-advertising** generates subscription revenues from services such as YouTube Premium and YouTube TV.

Google Cloud

Google was a company built in the cloud, and we continue to invest in our Google Cloud offerings, including Google Cloud Platform and Google Workspace. Google Cloud Platform provides leading technology in cybersecurity; data, analytics, AI, and machine learning; and infrastructure. Our cybersecurity products help customers detect, protect, and respond to a broad range of cybersecurity threats. Our data cloud unifies data lakes, data warehouses, data governance, and advanced machine learning into a single platform that can analyze data across any cloud. We provide customers an open, reliable, and scalable infrastructure that enables them to run workloads anywhere — on our Cloud, at the edge, or in their data centers. Additionally, Google Workspace's easy-to-use and secure communication and collaboration tools, which include apps like Gmail, Docs, Drive, Calendar, Meet, and more, enable secure hybrid work, boosting productivity and collaboration.

Other Bets

Across Alphabet we are also using technology to try to solve big problems that affect a wide variety of industries from improving transportation and health technology to exploring solutions to address climate change. Alphabet's investment in the portfolio of Other Bets includes businesses that are at various stages of development, ranging from those in the R&D phase to those that are in the beginning stages of commercialization. Our goal is for them to become thriving, successful businesses. Other Bets operate as independent companies and some of them have their own boards with independent members and outside investors. 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.

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, among others, from:

- general purpose search engines and information services;
- vertical search engines and e-commerce providers for queries related to travel, jobs, and health, which users may navigate directly to rather than go through Google;
- online advertising platforms and networks;
- other forms of advertising, such as billboards, magazines, newspapers, radio, and television as our advertisers typically advertise in multiple media, both online and offline;
- digital content and application platform providers;
- providers of enterprise cloud services;
- companies that design, manufacture, and market consumer hardware products, including businesses that have developed proprietary platforms;
- providers of digital video services;
- social networks, which users may rely on for product or service referrals, rather than seeking information through traditional search engines;
- providers of workspace communication and connectivity products; and
- digital assistant providers.

Competing successfully depends heavily on our ability to develop and distribute innovative products and technologies to the marketplace across our businesses. For example, 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 more than 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 five 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 were 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 2022, we had fully allocated the net proceeds from our sustainability bonds as outlined in our Sustainability Bond Impact Report published in 2022.

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 and circular 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, including our consumer hardware products;
- 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 (one billion tons) of carbon emissions annually.

We also aim to maximize the reuse of finite resources across our operations, products, and supply chains and to enable others to do the same.

We are committed to helping people make more sustainable choices by empowering them with technology. We introduced eco-friendly routing in Google Maps; new features to book flights or purchase appliances that have lower carbon footprints; and when people come to Google Search with questions about climate change, we show information from authoritative sources like the United Nations.

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 are focused on three areas: enhancing our stewardship of water resources across Google offices 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. At Google 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. 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 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, 2022, Alphabet had 190,234 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 local, as well as foreign laws and regulations covering a wide variety of subjects. 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. Particularly with regard to data privacy and security; content moderation; competition; consumer protection; climate change and sustainability; and reporting on human capital and diversity, we have seen an increase in new and evolving laws and regulations, as well as related enforcement actions, being proposed and implemented in recent years by legislative bodies around the world.

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. Access to 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, is available via a link through our investor relations website, free of charge, after we file or furnish them with the SEC and they are available on the SEC's website.

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. 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. 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 online advertising in 2022. 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. 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 these 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 business, reputation, financial condition, and operating results.

In addition, expenditures by advertisers tend to correlate with overall economic conditions. 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, financial condition, 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, initiating intellectual property and competition claims (whether or not meritorious), and continuing to compete 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 financial condition and operating results may also suffer if our products and services are not responsive to the evolving needs and desires of our users, advertisers, publishers, customers, and content providers. As new and existing technologies continue to develop, competitors and new entrants may be able to offer experiences that are, or that are seen to be, substantially similar to or better than ours. These technologies could reduce usage of our products and services, and force us to compete in different ways and expend significant resources to develop and operate equal or better products and services. Competitors' success in providing compelling products and services or in attracting and retaining users, advertisers, publishers, customers, and content providers could harm our financial condition and operating results.

Our ongoing investment in new businesses, products, services, and technologies is inherently risky, and could divert management attention and harm our business, 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 our businesses, such as in AI, reflect our ongoing efforts to innovate and provide products and services that are useful to users, advertisers, publishers, customers, and content providers. Our investments 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 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 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, invest in cybersecurity, and hire talent, particularly to support and scale our sales force. At the same time, our competitors are rapidly developing and deploying cloud-based services. Pricing and delivery models are competitive and constantly evolving, and we may not attain sufficient scale and profitability to achieve our business objectives. Further, our business with public sector customers may present additional risks, including regulatory compliance risks. For instance, we may be subject to government audits and cost reviews, and any failure to comply or any deficiencies found may expose us to legal, financial, and/or reputational risks. Evolving laws and regulations may require us to make new capital investments, build new products, and seek partners to deliver localized services in other countries, and we may not be able to meet sovereign operating requirements.

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, many of which involve the development of new and emerging technologies, may not be successful, or be able to compete effectively or operate at sufficient levels of profitability.

In addition, new and evolving products and services, including those that use AI, require significant investment and 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 investment areas are inherently risky, no assurance can be given that such strategies and offerings will be successful or 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 changes in the devices and modalities used to access our products and services; changes in geographic mix; deceleration or declines in advertiser spending; competition; customer usage and demand for our products; decreases in our pricing of our products and services; ongoing product and policy changes; and shifts to lower priced products and services.

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. In particular, margins on our hardware products have had, and may continue to have, an adverse affect on our consolidated margins due to pressures on pricing and higher cost of sales. We may also experience downward pressure on our operating margins from increasing regulations, increasing competition, and increasing costs for many aspects of our business. Further, certain of our costs and expenses are generally less variable in nature and may not correlate to changes in revenue. Additionally, in conjunction with our efforts to re-engineer costs, we may not be able to execute these efforts in a timely manner or these efforts may not be successful. 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 and Revenues and Monetization Metrics 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 financial condition and 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 our brands could harm our business, reputation, 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 business, financial condition, and operating results.

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 services.

We rely on contract manufacturers to manufacture or assemble our hardware products and servers and networking equipment used in our technical infrastructure, and we may supply the contract manufacturers with components to assemble the hardware products and equipment. We also rely on other companies to participate in the distribution of our products and services. 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, price increases, and/or longer lead times that could negatively affect our operations, driven by raw material, component availability, manufacturing capacity, labor shortages, industry allocations, logistics capacity, inflation, foreign currency exchange rates, tariffs, sanctions and export controls, trade disputes and barriers, geopolitical tensions, armed conflicts, 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, 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 our hardware 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. A significant supply interruption that affects us or our vendors could delay critical data center upgrades or expansions and delay consumer product availability.

We may enter into long-term contracts for materials and products that commit us to significant terms and conditions. We may face costs for materials and products that are not consumed due to market demand, technological change, changed consumer preferences, 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 harm our financial condition and operating 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 and practices, 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.

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, state-sponsored attacks, natural disasters or pandemics, geopolitical tensions or armed conflicts, 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, software bugs, 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 or disruptions as a result of geopolitical tensions and conflicts happening in the area. 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. Any of these incidents could impede or prevent us from effectively offering products and providing services, which could harm our reputation, financial condition, and operating results.

Our international operations expose us to additional risks that could harm our business, 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 51% of our consolidated revenues in 2022. 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 new customer requirements), in addition to other adverse effects that we are unable to effectively anticipate;
- sanctions, export controls, and trade restrictions that limit our ability to operate in certain jurisdictions or to comply with local laws, including as a result of geopolitical tensions or armed conflicts, such as the ongoing conflict in Ukraine;
- political unrest, conflict, and changes in governmental regimes that may adversely affect demand and usage of our products and services, may limit the ability for people in certain areas to access and use our products and services, or may impede us from offering products or providing services to a particular market;
- 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 regulatory outcomes and other liabilities, including uncertainty as a result of local laws, insufficient due process, 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.

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 realize on such investments.

As a result of these factors, the value of our investments could decline, which 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 may be undertaken via voice-activated search, 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 harm our reputation, cause us to incur significant liability, and deter current and potential users or customers from using our products and services. Computer viruses, 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 and reputation.

Concerns about, including the adequacy of, our practices with regard to the collection, use, governance, disclosure, or security of personal data or other data-privacy-related matters, even if unfounded, could harm our business, 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 liabilities, 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, and/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 software supply chain 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. In addition, we face the risk of cyber attacks by nation-states and state-sponsored actors. These attacks may target us or our customers, particularly our public sector customers (including federal, state, and local governments). Geopolitical tensions or armed conflicts, such as the ongoing conflict in Ukraine, may increase these risks.

We may experience security issues, whether due to employee or insider error or malfeasance, 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, enforcement actions, litigation, and negative publicity. There is also no guarantee that a series of issues may not be determined to be material at a later date in the aggregate, even if they may not be material individually at the time of their occurrence. 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, fail to comply with our terms and policies, or otherwise suffer a network or other security breach, our users' data 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 actions, fines, and penalties. Any of the foregoing consequences could harm our business, reputation, financial condition, and operating results.

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, Regulations, and Policies' 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. There is also no guarantee that a series of issues may not be determined to be material at a later date in the aggregate, even if they may not be material individually at the time of their occurrence.

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 harm 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 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 and operating results. It may also subject us to litigation and regulatory actions, 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; harm our reputation; and increase costs, thereby negatively affecting our business.

Risks Related to Laws, Regulations, and Policies

We are subject to a variety of new, existing, and changing laws and regulations worldwide that could harm our business, and will likely be subject to an even broader scope of laws and regulations as we continue to expand our business.

We are subject to numerous U.S. and foreign laws and regulations covering a wide variety of subjects, and our introduction of new businesses, products, services, and technologies will likely continue to subject us to additional laws and regulations. In recent years, governments around the world have proposed and adopted a large number of new laws and regulations relevant to the digital economy, particularly in the areas of data privacy and security, competition, and online content. The costs of compliance with these measures are high and are likely to increase in the future.

New or changing laws and regulations, or new interpretations or applications of existing laws and regulations in a manner inconsistent with our practices, have resulted in, and may continue to result in, less useful products and services, altered business practices, limited ability to pursue certain business models or offer certain products and services, substantial costs, and civil or criminal liability. Examples include laws and regulations regarding:

- **Competition and technology platforms' business practices:** Laws and regulations focused on large technology platforms, including the Digital Markets Act in the European Union (EU); regulations in South Korea and elsewhere that affect Google Play's billing policies, fees, and business model; as well as regulations under consideration in a range of jurisdictions.
- **Data privacy, collection, and processing:** Laws and regulations further restricting the collection, processing, and/or sharing of user or advertising-related data, including privacy and data protection laws, laws affecting the processing of children's data (as discussed further below), data breach notification laws, and laws limiting data transfers (including data localization laws).
- **Copyright and other intellectual property:** Copyright and related laws, including the EU Directive on Copyright in the Digital Single Market and European Economic Area transpositions, which may introduce new licensing regimes, increase liability with respect to content uploaded by users or linked to from our platforms, or create property rights in news publications that could require payments to news agencies and publishers.
- **Content moderation:** Various laws covering content moderation and removal, and related disclosure obligations, such as the EU's Digital Services Act, Florida's Senate Bill 7072 and Texas' House Bill 20, and laws and proposed legislation in Singapore, Australia, and the United Kingdom that impose penalties for failure to remove certain types of content or require disclosure of information about the operation of our services and algorithms, which may make it harder for services like Google Search and YouTube to detect and deal with low-quality, deceptive, or harmful content.
- **Consumer protection:** Consumer protection laws, including the EU's New Deal for Consumers, which could result in monetary penalties and create a range of new compliance obligations.

In addition, the applicability and scope of these and other laws and regulations, as interpreted by the courts, remain uncertain and could be interpreted in ways that harm our business. For example, we rely on statutory safe harbors, like those 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, to protect against liability for various linking, caching, ranking, recommending, and hosting activities. Legislation or court rulings affecting these safe harbors may adversely affect us and may impose significant operational challenges. There are legislative proposals and pending litigation in the U.S. (such as *Gonzalez v. Google*), EU, and around the world that could diminish or eliminate safe harbor protection for websites and online platforms.

We are and may continue to be subject to claims, lawsuits, regulatory and government investigations, enforcement actions, consent orders, and other forms of regulatory scrutiny and legal liability that could harm our business, reputation, financial condition, and operating results.

We are subject to claims, lawsuits, regulatory and government investigations, other proceedings, and consent orders involving competition, intellectual property, data privacy and security, 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, and other matters. 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, and we may also be subject to claims involving health and safety, hazardous materials usage, other environmental effects, or service disruptions or failures. Claims have been brought, 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, privacy rights violations, fraud, or other legal theories based on the nature and content of information available on or via our services or due to our involvement in hosting, transmitting, marketing, branding, or providing access to content created by third parties.

For example, the U.S. Department of Justice, various U.S. states, and other plaintiffs have filed several antitrust lawsuits about various aspects of our business, including our advertising technologies and practices, the operation and distribution of Google Search, and the operation and distribution of the Android operating system and Play Store. Other regulatory agencies in the U.S. and around the world, including competition enforcers, consumer protection agencies, and data protection authorities, have challenged and may continue to challenge our business practices and compliance with laws and regulations. We are cooperating with these investigations and defending 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 monitoring and auditing 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.

Any of these legal proceedings could result in legal costs, diversion of management resources, negative publicity and other harms to our business. Estimating liabilities for our pending litigation is a complex, fact-intensive process that requires significant judgment, and the amounts we are ultimately liable for may exceed our estimates. 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, reputation, financial condition, and operating results.

Privacy, data protection, and data usage 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, data usage, and 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 practices, which have had and could continue to have an adverse effect on how we provide services, harming our business, reputation, financial condition, and operating results. These laws and regulations are evolving and subject to interpretation, and compliance obligations could cause us to incur substantial costs or harm the quality and operations of our products and services in ways that harm our business. Examples of these laws include:

- The General Data Protection Regulation and the United Kingdom General Data Protection Regulations, which apply to all of our activities conducted from an establishment in the EU or the United Kingdom, respectively, or related to products and services that we offer to EU or the United Kingdom users or customers, respectively, or the monitoring of their behavior in the EU or the UK, respectively.
- Various state and foreign privacy laws and regulations, such as the California Consumer Privacy Act of 2018, the California Privacy Rights Act, the Virginia Consumer Data Protection Act, the Colorado Privacy Act, the Connecticut Data Privacy Act, and the Utah Consumer Privacy Act, 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.
- State laws governing the processing of biometric information, such as the Illinois Biometric Information Privacy Act and the Texas Capture or Use of Biometric Identifier Act, which impose obligations on businesses that collect or disclose consumer biometric information.
- Various federal, state, and foreign laws governing how companies provide age appropriate experiences to children and minors, including the collection and processing of children and minor's data. These include the Children's Online Privacy Protection Act of 1998, the United Kingdom Age-Appropriate Design Code, and the California Age Appropriate Design Code, all of which address the use and disclosure of the personal data of children and minors and impose obligations on online services or products directed to or likely to be accessed by children.
- The California Internet of Things Security Law, which regulates the security of data used in connection with internet-connected devices.
- The EU's Digital Markets Act, which will require in-scope companies to obtain user consent for combining data across certain products and require search engines to share anonymized data with rival companies, among other changes.

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. Previously available transfer mechanisms, such as the EU-U.S. and the Swiss-U.S. Privacy Shield frameworks, were invalidated in 2020, and other bases for data transfer and storage, such as Standard Contractual Clauses, remain subject to ongoing review in ways that may require us to adapt our existing contractual arrangements. The validity of various data transfer mechanisms remains subject to legal, regulatory, and political developments in both Europe and the U.S., including the potential adoption of the U.S.-EU Data Privacy Framework. Until the U.S.-EU Data Privacy Framework is adopted by the EU, the legal uncertainty and ongoing enforcement action from supervisory authorities related to cross-border transfers of personal data, could harm our ability to process and transfer personal data outside of the European Economic Area and could in turn harm our ability to provide, and our customers' ability to use, some of our products and services.

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.

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, including patent, copyright, trade secrets, and trademarks. 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. In addition, patent-holding companies may frequently seek to generate income from patents they have obtained by bringing claims against us. As we continue to expand our business, the number of intellectual property claims against us has increased and may continue to increase as we develop and acquire new products, services, and technologies.

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 limiting our ability to sell our products and services in the U.S. or elsewhere, including by preventing us from offering certain features, functionalities, products, or services in certain jurisdictions. They may also cause us to change our business practices in ways that 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 harm 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 could harm our business, including our product and service offerings, financial condition, and operating results.

Expectations relating to environmental, social, and governance (ESG) considerations could expose us to potential liabilities, increased costs, and reputational harm.

We are subject to laws, regulations, and other measures that govern a wide range of topics, including those related to matters beyond our core products and services. For instance, new laws, regulations, policies, and international accords relating to ESG 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 ESG programs, adopted reporting frameworks and principles, and announced a number of goals and initiatives. 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, may change, and we cannot guarantee that we will achieve them. Any failure, or perceived failure, by us to adhere to our public statements, comply fully with developing interpretations of ESG laws and regulations, or meet evolving and varied stakeholder expectations and standards could harm our business, reputation, 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.

We are subject to a variety of taxes and tax collection obligations in the U.S. and numerous foreign jurisdictions. Our effective tax rates are affected by a variety of factors, including changes in the mix of earnings in jurisdictions with different statutory tax rates, net gains and losses on hedges and related transactions under our foreign exchange risk management program, decreases in our stock price for shares issued as employee compensation, changes in the valuation of our deferred tax assets or liabilities, and 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). Further, if we are unable or fail to collect taxes on behalf of customers, employees and partners as the withholding agent, we could become liable for taxes that are levied against third parties.

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, on various tax-related assertions, such as transfer-pricing adjustments or permanent-establishment claims. Any adverse outcome of such a review or audit could harm our financial condition and operating results, require adverse changes to our business practices, or subject us to additional litigation and regulatory inquiries. In addition, the determination of our worldwide provision for income taxes and other tax liabilities requires significant judgment and often involves uncertainty. 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 could harm our financial condition and operating results. Various jurisdictions around the world have enacted or are considering revenue-based taxes such as digital services taxes and other targeted taxes, which could lead to inconsistent and potentially overlapping international tax regimes. The Organization for Economic Cooperation and Development continues to advance proposals for modernizing international tax rules.

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, 2022, Larry Page and Sergey Brin beneficially owned approximately 85.8% of our outstanding Class B stock, which represented approximately 51.2% 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 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.

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 significant volatility and may continue to be volatile. In addition to the factors discussed in this report, the trading prices 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 could harm the market price of our Class A stock and our Class C stock, regardless of our actual operating performance.

General Risks

The continuing effects of the COVID-19 pandemic and its impact are highly unpredictable and could be significant, and could harm our business, financial condition, and operating results.

Our business, operations and financial performance have been, and may continue to be, affected by the macroeconomic impacts resulting from COVID-19, and as a result, 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. The extent to which our business will continue to be affected will depend on a variety of factors, many of which are outside of our control, including the persistence of the pandemic, impacts on economic activity, and the possibility of recession or continued financial market instability.

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 cyclical 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 could 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 the acquired operations, technologies, services, and personnel (including cultural integration and retention of employees) 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 and other administrative systems, and the 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;
- failure to accomplish commercial, strategic or financial objectives with respect to investments and joint ventures;
- failure to realize the value of investments and joint ventures due to a lack of liquidity;
- 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 and 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 could harm our financial condition and 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 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 and continue to adapt our corporate culture, we may not be able to grow or operate 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, and may continue to target, 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. As we experiment with hybrid work models, we may experience increased costs and/or disruption, in addition to potential effects on our ability to operate effectively and maintain our corporate culture.

— **ITEM 1B. UNRESOLVED STAFF COMMENTS**

Not applicable.

— **ITEM 2. PROPERTIES**

Our headquarters are located in Mountain View, California. We own and lease office facilities and data centers around the world, primarily in North America, Europe, and Asia. We believe our existing facilities 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 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 stock is neither listed nor traded. Our Class C 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, 2022, there were approximately 6,670 and 1,657 stockholders of record of our Class A stock and Class C stock, respectively. Because many of our shares of Class A stock and Class C 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, 2022, there were approximately 64 stockholders of record of our Class B 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 and Class C stock during the quarter ended December 31, 2022:

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	8,585	46,059	\$ 98.92	\$ 99.16	54,644	\$ 38,069
November 1 - 30	1,968	55,374	\$ 95.89	\$ 93.51	57,342	\$ 32,703
December 1 - 31	4,687	44,649	\$ 91.93	\$ 93.93	49,336	\$ 28,079
Total	15,240	146,082			161,322	

(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.

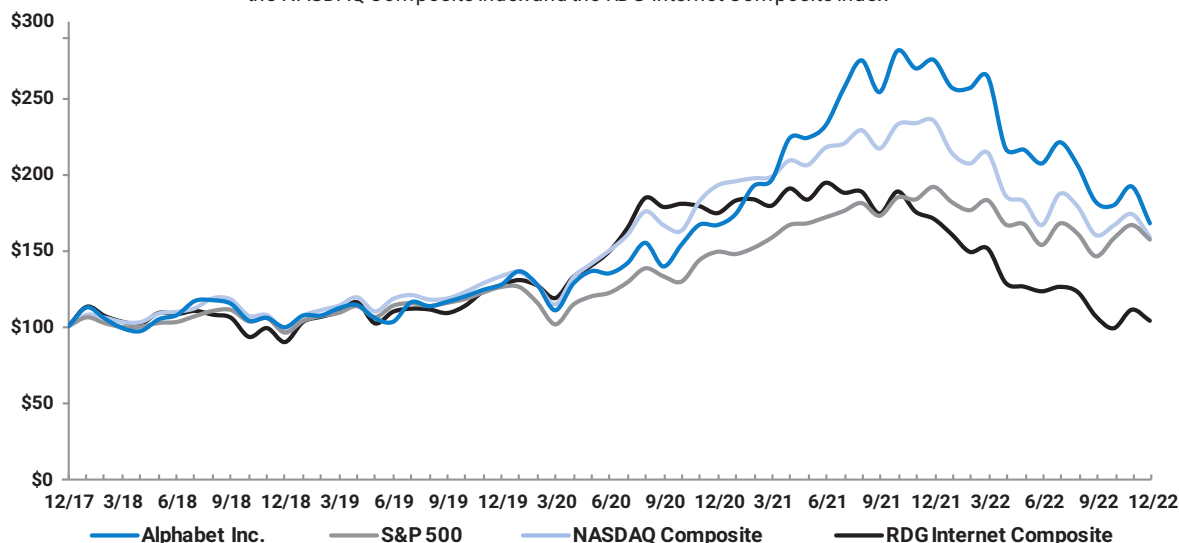
Stock Performance Graphs

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, 2017 to December 31, 2022. The returns shown are based on historical results and are not intended to suggest future performance.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN*

ALPHABET INC. CLASS A COMMON STOCK

Among Alphabet Inc., the S&P 500 Index,
the NASDAQ Composite Index and the RDG Internet Composite Index



*\$100 invested on December 31, 2017 in stock or index, including reinvestment of dividends.

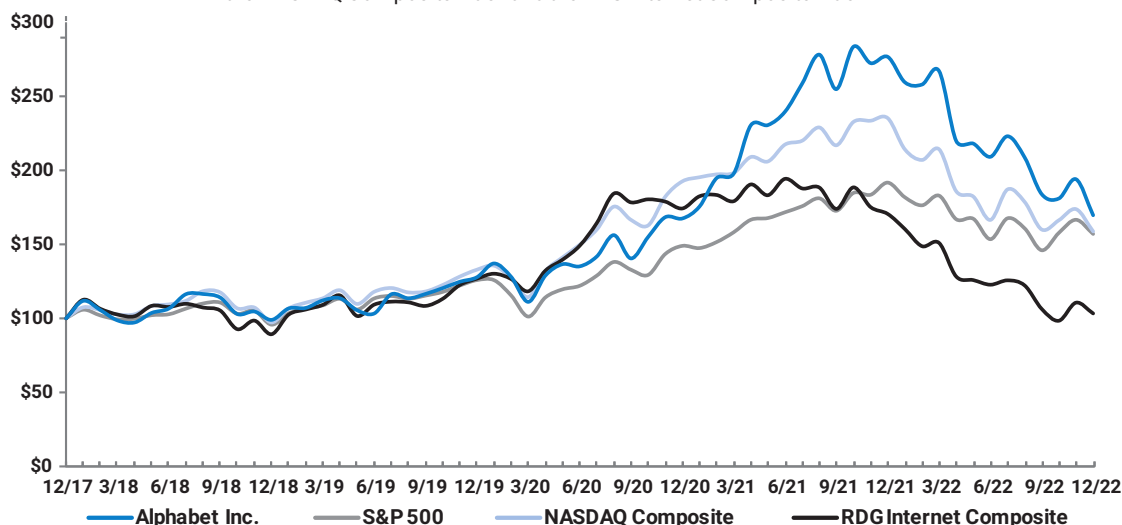
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The graph below matches Alphabet Inc. Class C's cumulative 5-year total stockholder return on capital stock with the cumulative total returns of the S&P 500 index, the NASDAQ Composite index, and the RDG Internet Composite index. The graph tracks the performance of a \$100 investment in our Class C capital stock and in each index (with the reinvestment of all dividends) from December 31, 2017 to December 31, 2022. The returns shown are based on historical results and are not intended to suggest future performance.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN*

ALPHABET INC. CLASS C CAPITAL STOCK

Among Alphabet Inc., the S&P 500 Index,
the NASDAQ Composite Index and the RDG Internet Composite Index



*\$100 invested on December 31, 2017 in stock or in index, including reinvestment of dividends.

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— 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 2020 results where it would be redundant to the discussion previously included in Item 7 of our 2021 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. 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 and our revenues since inception. We expect that this shift to an online world will continue to benefit our business and our revenues, although at a slower pace than we have experienced historically, in particular after the outsized growth in our advertising revenues during the COVID-19 pandemic. In addition, we face increasing competition for user engagement and advertisers, which may affect our revenues.

- **Users continue to access our products and services using diverse devices and modalities, which allows for new advertising formats that may benefit our revenues but adversely affect our margins.**

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 benefit from advertising revenues generated from different channels, including mobile, and newer advertising formats. The margins 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 advertising 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 revenues.

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 revenues 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 our product offerings to serve these changing needs, which may affect our monetization. For example, revenues from ads on YouTube and Google Play monetize at a lower rate than our traditional search ads. We also may develop new products incorporating AI innovations that could affect our monetization trends. Additionally, when developing new products and services we generally focus first on user experience before prioritizing monetization.

- **As users in developing economies increasingly come online, our revenues from international markets continue to increase, and may require continued investments. In addition, 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 revenues that we derive from non-advertising products and services are increasing and may adversely affect our margins.**

Non-advertising revenues have grown over time, and we expect this trend to continue as we focus on expanding our products and services. The margins on these revenues vary significantly and are generally lower than the margins on our advertising revenues. In particular margins on our hardware products adversely affect our consolidated margins due to pressures on pricing and higher cost of sales.

- **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 research and development investments in areas of strategic focus as we seek to develop new, innovative offerings and improve our existing offerings across our businesses. We also expect to continue to invest in our technical infrastructure, including servers, network equipment, and data centers, to support the growth of our business and our long-term initiatives, in particular in support of AI. 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 September 2022 we closed the acquisition of Mandiant to help expand our offerings in dynamic cyber defense and response.

- **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, our ability to pursue certain business models or offer certain products or services may be limited, and we may need to change our business practices. Examples include the antitrust complaints filed by the U.S. Department of Justice and a number of state Attorneys General; pending litigation in the U.S., EU, and around the world that could diminish or eliminate safe harbor protection for websites and online platforms; and the Digital Markets Act and Digital Services Act in Europe and various legislative proposals in the U.S. focused on large technology platforms. For additional information see Item 1A Risk Factors and Legal Matters in Note 10 of the Notes to Consolidated Financial Statements included in Part II, Item 8.

- **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."

Revenues and Monetization Metrics

We generate revenues by delivering relevant, cost-effective online advertising; cloud-based solutions that provide enterprise customers of all sizes with infrastructure and platform services as well as communication and collaboration tools; sales of other products and services, such as apps and in-app purchases, and hardware; and fees received for subscription-based products. For 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.

In addition to the long-term trends and their financial effect on our business noted above, fluctuations in our revenues have been and may continue to be affected by a combination of factors, including:

- changes in foreign currency exchange rates;
- changes in pricing, such as those resulting from changes in fee structures, discounts, and customer incentives;
- general economic conditions and various external dynamics, including geopolitical events, regulations, and other measures and their effect on advertiser, consumer, and enterprise spending;
- new product and service launches; and
- seasonality.

Additionally, fluctuations in our revenues generated from advertising ("Google advertising"), revenues from other sources ("Google other revenues"), Google Cloud, and Other Bets revenues have been and may continue to be affected by other factors unique to each set of revenues, as described below.

GOOGLE SERVICES

Google Services revenues consist of Google advertising as well as 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-impression pertain to traffic on our Google Network 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.

Fluctuations in our advertising revenues, 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 and may continue to be affected by additional factors, such as:

- advertiser competition for keywords;
- changes in advertising quality, formats, delivery or policy;
- changes in device mix;
- seasonal fluctuations in internet usage, advertising expenditures, and underlying business trends, such as traditional retail seasonality; and
- traffic growth in emerging markets compared to more mature markets and across various verticals and channels.

Google Other

Google other revenues are comprised of the following:

- Google Play, which includes sales of apps and in-app purchases;
- hardware, which includes sales of Fitbit wearable devices, Google Nest home products, and Pixel devices;
- YouTube non-advertising, which includes subscription revenues from services such as YouTube Premium and YouTube TV; and
- other products and services.

Fluctuations in our Google other revenues have been and may continue to be affected by additional factors, such as changes in customer usage and demand, number of subscribers, and fluctuations in the timing of product launches.

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 communication and collaboration tools for enterprises, such as Gmail, Docs, Drive, Calendar and Meet; and
- other enterprise services.

Fluctuations in our Google Cloud revenues have been and may continue to be affected by additional factors, such as customer usage.

OTHER BETS

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

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 our costs and 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 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.

TAC as a percentage of revenues generated from ads placed on Google Network properties are significantly higher than TAC 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
- third-party services fees primarily relating to consulting and outsourced services in support of our engineering and product development efforts.

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 relating to legal matters, including fines and settlements; and
- third-party services fees, including audit, consulting, outside legal, and other outsourced administrative 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 our consolidated financial results (in millions, except for per share information and percentages):

	Year Ended December 31,		\$ Change	% Change
	2021	2022		
Consolidated revenues	\$ 257,637	\$ 282,836	\$ 25,199	10%
Change in consolidated constant currency revenues ⁽¹⁾				14%
Cost of revenues	\$ 110,939	\$ 126,203	\$ 15,264	14%
Operating expenses	\$ 67,984	\$ 81,791	\$ 13,807	20%
Operating income	\$ 78,714	\$ 74,842	\$ (3,872)	(5)%
Operating margin	31%	26%		(5)%
Other income (expense), net	\$ 12,020	\$ (3,514)	\$ (15,534)	(129)%
Net income	\$ 76,033	\$ 59,972	\$ (16,061)	(21)%
Diluted EPS	\$ 5.61	\$ 4.56	\$ (1.05)	(19)%

(1) See "Use of Non-GAAP Constant Currency Measures" below for details relating to our use of constant currency information.

- Revenues were \$282.8 billion, an increase of 10% year over year, primarily driven by an increase in Google Services revenues of \$16.0 billion, or 7%, and an increase in Google Cloud revenues of \$7.1 billion, or 37%.
- Total constant currency revenues, which exclude the effect of hedging, increased 14% year over year.
- Cost of revenues was \$126.2 billion, an increase of 14% year over year, primarily driven by an increase in other costs of revenues.
- Operating expenses were \$81.8 billion, an increase of 20% year over year, primarily driven by increases in compensation expenses due to headcount growth, third-party service fees, and advertising and promotional expenses.

Other information:

- On September 12, 2022, we closed the acquisition of Mandiant for a total purchase price of \$6.1 billion and added more than 2,600 employees. Mandiant's financial results are reported within Google Cloud as of the acquisition date. See Note 8 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for additional information.
- On July 15, 2022, the company executed a 20-for-one stock split with a record date of July 1, 2022, effected 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. All prior period references made to share or per share amounts throughout this Management's Discussion and Analysis of Financial Condition and Results of Operations prior to the effective date have been retroactively adjusted to reflect the effects of the Stock Split. 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.

- Beginning in the first quarter of 2022, we suspended the vast majority of our commercial activities in Russia and effectively ceased business activities of our Russian entity. The ongoing effect of these direct actions on our financial results was not material. The broader economic effects resulting from the war in Ukraine on our future financial results may be unpredictable.
- Repurchases of Class A and Class C shares were \$59.3 billion for the year ended December 31, 2022. 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.
- Operating cash flow was \$91.5 billion for the year ended December 31, 2022.
- Capital expenditures, which primarily reflected investments in technical infrastructure, were \$31.5 billion for the year ended December 31, 2022.
- As of December 31, 2022, we had 190,234 employees.

Additionally, looking ahead to fiscal year 2023:

- In January 2023, we announced a reduction of our workforce of approximately 12,000 roles. We expect to incur employee severance and related charges of \$1.9 billion to \$2.3 billion, the majority of which will be recognized in the first quarter of 2023.
In addition, we are taking actions to optimize our global office space. As a result we expect to incur exit costs relating to office space reductions of approximately \$0.5 billion in the first quarter of 2023. We may incur additional charges in the future as we further evaluate our real estate needs.
- In January 2023, we completed an assessment of the useful lives of our servers and network equipment, resulting in a change in the estimated useful life of our servers and certain network equipment to six years, which we expect to result in a reduction of depreciation of approximately \$3.4 billion for the full fiscal year 2023 for assets in service as of December 31, 2022, recorded primarily in cost of revenues and R&D expenses.
- As AI is critical to delivering our mission of bringing our breakthrough innovations into the real world, beginning in January 2023, we will update our segment reporting relating to certain of Alphabet's AI activities. DeepMind, previously reported within Other Bets, will be reported as part of Alphabet's corporate costs, reflecting its increasing collaboration with Google Services, Google Cloud, and Other Bets. Prior periods will be recast to conform to the revised presentation. See Note 15 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for information relating to our segments.

Financial Results

Revenues

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

	Year Ended December 31,	
	2021	2022
Google Search & other	\$ 148,951	\$ 162,450
YouTube ads	28,845	29,243
Google Network	31,701	32,780
Google advertising	209,497	224,473
Google other	28,032	29,055
Google Services total	237,529	253,528
Google Cloud	19,206	26,280
Other Bets	753	1,068
Hedging gains (losses)	149	1,960
Total revenues	\$ 257,637	\$ 282,836

Google Services

GOOGLE ADVERTISING REVENUES

Google Search & other

Google Search & other revenues increased \$13.5 billion from 2021 to 2022. The 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. Growth was adversely affected by the unfavorable effect of foreign currency exchange rates.

YouTube ads

YouTube ads revenues increased \$398 million from 2021 to 2022. The growth was driven by our brand advertising products followed by direct response products, both of which benefited from increased spending by our advertisers as well as improvements to ad formats and delivery. Growth was adversely affected by the unfavorable effect of foreign currency exchange rates.

Google Network

Google Network revenues increased \$1.1 billion from 2021 to 2022. The growth was primarily driven by strength in AdSense and AdMob. Growth was adversely affected by the unfavorable effect of foreign currency exchange rates.

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 2021 to 2022:

Paid clicks change	10%
Cost-per-click change	(1)%

Paid clicks increased from 2021 to 2022 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; growth in advertiser spending; and improvements we have made in ad formats and delivery.

Cost-per-click decreased from 2021 to 2022 driven by a number of interrelated factors including changes in device mix, geographic mix, advertiser spending, ongoing product changes, and property mix, as well as the unfavorable effect of foreign currency exchange rates.

Impressions and cost-per-impression

The following table presents changes in impressions and cost-per-impression (expressed as a percentage) from 2021 to 2022:

Impressions change	3%
Cost-per-impression change	1%

Impressions increased from 2021 to 2022 primarily driven by Google Ad Manager and AdMob. The increase in cost-per-impression from 2021 to 2022 was driven by a number of interrelated factors including ongoing product and policy changes, improvements we have made in ad formats and delivery, changes in device mix, geographic mix, product mix, and property mix, partially offset by the unfavorable effect of foreign currency exchange rates.

GOOGLE OTHER REVENUES

Google other revenues increased \$1.0 billion from 2021 to 2022 primarily driven by growth in YouTube non-advertising and hardware revenues, partially offset by a decrease in Google Play revenues. The growth in YouTube non-advertising was largely due to an increase in paid subscribers. The growth in hardware was primarily driven by increased sales of Pixel devices. The decrease in Google Play revenues was primarily driven by the fee structure changes we announced in 2021 as well as a decrease in buyer spending. Additionally, the overall increase in Google other revenues was adversely affected by the unfavorable effect of foreign currency exchange rates.

Google Cloud

Google Cloud revenues increased \$7.1 billion from 2021 to 2022. The growth was primarily driven by Google Cloud Platform followed by Google Workspace offerings. Google Cloud's infrastructure and platform services were the largest drivers of growth in Google Cloud Platform.

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,	
	2021	2022
United States	46%	48%
EMEA	31%	29%
APAC	18%	16%
Other Americas	5%	6%
Hedging gains (losses)	0%	1%

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 Non-GAAP Constant Currency Information

International revenues, which represent a significant portion of our revenues, are generally transacted in multiple currencies and therefore are affected by fluctuations in foreign currency exchange rates.

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 ("constant currency revenues") and non-GAAP percentage change in constant currency revenues ("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 revenues excluding the effect of foreign exchange rate movements ("FX Effect") as well as hedging activities, which are recognized at the consolidated level. We use constant currency revenues 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, 2022							
	Year Ended December 31,		Less FX Effect	Constant Currency Revenues	% Change from Prior Period			
	2021	2022			As Reported	Less Hedging Effect	Less FX Effect	Constant Currency Revenues
United States	\$ 117,854	\$ 134,814	\$ 0	\$ 134,814	14%		0%	14%
EMEA	79,107	82,062	(8,979)	91,041	4%		(11)%	15%
APAC	46,123	47,024	(3,915)	50,939	2%		(8)%	10%
Other Americas	14,404	16,976	(430)	17,406	18%		(3)%	21%
Revenues, excluding hedging effect	257,488	280,876	(13,324)	294,200	9%		(5)%	14%
Hedging gains (losses)	149	1,960						
Total revenues ⁽¹⁾	\$ 257,637	\$ 282,836		\$ 294,200	10%	1%	(5)%	14%

(1) Total constant currency revenues of \$294.2 billion for 2022 increased \$36.7 billion compared to \$257.5 billion in revenues, excluding hedging effect for 2021.

EMEA revenue growth was unfavorably affected by changes in foreign currency exchange rates, primarily due to the U.S. dollar strengthening relative to the Euro and the British pound.

APAC revenue growth was unfavorably affected by changes in foreign currency exchange rates, primarily due to the U.S. dollar strengthening relative to the Japanese yen and the Australian dollar.

Other Americas growth was unfavorably affected by changes in foreign currency exchange rates, primarily due to the U.S. dollar strengthening relative to the Argentine peso.

Costs and Expenses

COST OF REVENUES

The following table presents cost of revenues, including TAC (in millions, except percentages):

	Year Ended December 31,	
	2021	2022
TAC	\$ 45,566	\$ 48,955
Other cost of revenues	65,373	77,248
Total cost of revenues	\$ 110,939	\$ 126,203
Total cost of revenues as a percentage of revenues	43%	45%

Cost of revenues increased \$15.3 billion from 2021 to 2022. The increase was due to an increase in other cost of revenues and TAC of \$11.9 billion and \$3.4 billion, respectively.

The increase in TAC from 2021 to 2022 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 was 22% in both 2021 and 2022. The TAC rate on Google Search & other revenues and the TAC rate on Google Network revenues were both substantially consistent from 2021 to 2022.

The increase in other cost of revenues from 2021 to 2022 was primarily due to increases in data center costs and other operations costs as well as hardware costs.

RESEARCH AND DEVELOPMENT

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

	Year Ended December 31,	
	2021	2022
Research and development expenses	\$ 31,562	\$ 39,500
Research and development expenses as a percentage of revenues	12%	14%

R&D expenses increased \$7.9 billion from 2021 to 2022 primarily driven by an increase in compensation expenses of \$5.4 billion, largely resulting from a 21% increase in average headcount, and an increase in third-party service fees of \$704 million.

SALES AND MARKETING

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

	Year Ended December 31,	
	2021	2022
Sales and marketing expenses	\$ 22,912	\$ 26,567
Sales and marketing expenses as a percentage of revenues	9%	9%

Sales and marketing expenses increased \$3.7 billion from 2021 to 2022, primarily driven by an increase in compensation expenses of \$1.8 billion, largely resulting from a 19% increase in average headcount, and an increase in advertising and promotional activities of \$1.3 billion.

GENERAL AND ADMINISTRATIVE

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

	Year Ended December 31,	
	2021	2022
General and administrative expenses	\$ 13,510	\$ 15,724
General and administrative expenses as a percentage of revenues	5%	6%

General and administrative expenses increased \$2.2 billion from 2021 to 2022. The increase was primarily driven by an increase in compensation expenses of \$1.1 billion, largely resulting from a 21% increase in average headcount, and an increase in third-party services fees of \$815 million. In addition, there was a \$551 million increase to the allowance for credit losses for accounts receivable, as the prior year comparable period reflected a decline in the allowance.

SEGMENT PROFITABILITY

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

	Year Ended December 31,	
	2021	2022
Operating income (loss):		
Google Services	\$ 91,855	\$ 86,572
Google Cloud	(3,099)	(2,968)
Other Bets	(5,281)	(6,083)
Corporate costs, unallocated ⁽¹⁾	(4,761)	(2,679)
Total income from operations	\$ 78,714	\$ 74,842

(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 and totaled \$149 million and \$2.0 billion in 2021 and 2022, respectively.

GOOGLE SERVICES

Google Services operating income decreased \$5.3 billion from 2021 to 2022. The decrease in operating income was primarily driven by increases in compensation expenses and TAC, partially offset by growth in revenues.

GOOGLE CLOUD

Google Cloud operating loss decreased \$131 million from 2021 to 2022. The decrease in operating loss was primarily driven by growth in revenues, partially offset by an increase in compensation expenses.

OTHER BETS

Other Bets operating loss increased \$802 million from 2021 to 2022. The increase in operating loss was primarily driven by increases in compensation expenses, partially offset by growth in revenues.

OTHER INCOME (EXPENSE), NET

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

	Year Ended December 31,	
	2021	2022
Other income (expense), net	\$ 12,020	\$ (3,514)

Other income (expense), net, decreased \$15.5 billion from 2021 to 2022 primarily due to changes in gains and losses on equity securities and performance fees. In 2022, \$3.2 billion of net unrealized losses were recognized on marketable equity securities and \$1.5 billion of net realized losses were recognized on debt securities. These losses were partially offset by interest income of \$2.2 billion and reversals of previously accrued performance fees related to certain investments of \$798 million. In 2021, \$9.8 billion of net unrealized gains were recognized on non-marketable equity securities and \$1.5 billion of interest income was recognized, partially offset by \$1.9 billion of accrued performance fees related to certain investments.

See Note 7 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,	
	2021	2022
Income before provision for income taxes	\$ 90,734	\$ 71,328
Provision for income taxes	\$ 14,701	\$ 11,356
Effective tax rate	16.2%	15.9%

The effective tax rate decreased from 2021 to 2022, primarily driven by the effects of capitalization and amortization of R&D expenses in 2022 as required by the 2017 Tax Cuts and Jobs Act generating an increase in the U.S. federal Foreign Derived Intangible Income tax deduction. The decrease was partially offset by a decrease in pre-tax earnings, including in countries that have lower statutory rates and a decrease in the stock-based compensation related tax benefit. 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, 2022, we had \$113.8 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,	
	2021	2022
Net cash provided by operating activities	\$ 91,652	\$ 91,495
Net cash used in investing activities	\$ (35,523)	\$ (20,298)
Net cash used in financing activities	\$ (61,362)	\$ (69,757)

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 properties. Additionally, we generate cash through sales of apps and in-app purchases, 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, to employees for compensation, and to content providers. Other uses of cash from operating activities include payments to suppliers for hardware, to tax authorities for income taxes, and other general corporate expenditures.

Net cash provided by operating activities decreased from 2021 to 2022 primarily due to the net effect of an increase in cash received from revenues, offset by increases in cash paid for cost of revenues and operating expenses and an increase in tax payments driven by the effects of capitalization and amortization of R&D expenses beginning in 2022 as required by the 2017 Tax Cuts and Jobs Act.

CASH USED IN INVESTING ACTIVITIES

Cash provided by investing activities consists primarily of maturities and sales of 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 decreased from 2021 to 2022 as a result of a decrease in net purchases of and maturities and sales of marketable securities, partially offset by an increase in purchases of property and equipment.

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 stock, net payments related to stock-based award activities, and repayments of debt.

Net cash used in financing activities increased from 2021 to 2022 primarily due to an increase in repurchases of 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 AI, (collectively referred to as our information technology assets) and data center land and building construction; and
- office facilities, ground-up development projects, and building improvements (also referred to as "fit-outs").

Construction in progress consists primarily of technical infrastructure and office facilities which have not yet been placed in service. 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, 2021 and 2022, we spent \$24.6 billion and \$31.5 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, 2021 and 2022, our depreciation and impairment expenses on property and equipment were \$11.6 billion and \$15.3 billion, respectively.

Leases

For the years ended December 31, 2021 and 2022, we recognized total operating lease assets of \$3.0 billion and \$4.4 billion, respectively. As of December 31, 2022, the amount of total future lease payments under operating leases, which had a weighted average remaining lease term of 8 years, was \$17.4 billion, of which \$3.0 billion is short-term. As of December 31, 2022, we have entered into leases that have not yet commenced with future short-term and long-term lease payments of \$630 million and \$3.1 billion that are not yet recorded on our Consolidated Balance Sheets. These leases will commence between 2023 and 2026 with non-cancelable lease terms of 1 to 25 years.

For the years ended December 31, 2021 and 2022, our operating lease expenses (including variable lease costs) were \$3.4 billion and \$3.7 billion, respectively. Finance lease costs were not material for the years ended December 31, 2021 and 2022. 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. Net proceeds from this program are used for general corporate purposes. As of December 31, 2022, we had no commercial paper outstanding.

As of December 31, 2022, we had \$10.0 billion of revolving credit facilities, \$4.0 billion expiring in April 2023 and \$6.0 billion expiring in April 2026. The interest rates for all 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 credit facilities.

As of December 31, 2022, we had senior unsecured notes outstanding with a total carrying value of \$12.9 billion with short-term and long-term future interest payments of \$231 million and \$3.8 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.

We primarily utilize contract manufacturers for the assembly of our servers used in our technical infrastructure and hardware products we sell. We have agreements where we may purchase components directly from suppliers and then supply these components to contract manufacturers for use in the assembly of the servers and hardware products. Certain of these arrangements result in a portion of the cash received from and paid to the contract manufacturers to be presented as financing activities in the Consolidated Statements of Cash Flows included in Item 8 of this Annual Report on Form 10-K.

SHARE REPURCHASE PROGRAM

In April 2022, the Board of Directors of Alphabet authorized the company to repurchase up to \$70.0 billion of its Class A and Class C shares. As of December 31, 2022, \$28.1 billion remains available for Class A and Class C share repurchases. In accordance with the authorization of the Board of Directors of Alphabet, during 2022 we repurchased and subsequently retired 530 million shares for \$59.3 billion. Of the aggregate amount repurchased and subsequently retired, 61 million shares were Class A stock for \$6.7 billion and 469 million shares were Class C stock for \$52.6 billion. 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. On September 14, 2022, the General Court reduced the 2018 fine from €4.3 billion to €4.1 billion. We subsequently filed an appeal to the European Court of Justice. In 2018 we recognized a charge of \$5.1 billion for the fine, which we reduced by \$217 million in 2022.

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

TAXES

As of December 31, 2022, we had short-term and long-term income taxes payable of \$1.6 billion and \$4.2 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 \$5.1 billion primarily related to uncertain tax positions as of December 31, 2022.

PURCHASE COMMITMENTS

As of December 31, 2022, we had material non-cancelable contractual obligations of \$32.0 billion, of which \$17.3 billion was short-term. These amounts represent the non-cancelable portion of agreements or the minimum cancellation fee and are primarily related to commitments to purchase licenses, technical infrastructure, inventory, and network capacity. 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, 2022.

In addition we regularly enter into multi-year, non-cancellable agreements to purchase renewable energy and energy attributes, such as renewable energy certificates. These agreements do not include a minimum dollar commitment. The amounts to be paid under these agreements are based on the actual volumes to be generated and are not readily determinable.

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 method ("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 the quantitative remeasurements of fair value indicate an impairment exists, we write down the investment to its current fair value.

We also have compensation arrangements with payouts based on realized returns from certain investments, i.e. performance fees. We record compensation expense based on the estimated payouts on an ongoing basis, which may result in expense recognized before investment returns are realized and compensation is paid 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, lawsuits, regulatory and government investigations, other proceedings, and consent orders involving competition, intellectual property, data privacy and security, 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 2023, we completed an assessment of the useful lives of our servers and network equipment, resulting in a change in the estimated useful life of our servers and certain network equipment to six years, which we expect to result in a reduction of depreciation of approximately \$3.4 billion for the full fiscal year 2023 for assets in service as of December 31, 2022, recorded primarily in cost of revenues and R&D expenses. See Note 1 of the Notes to Consolidated Financial Statements included in Item 8 of this Annual Report on Form 10-K for information relating to the useful lives of our servers and network equipment.

— 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.

We use foreign currency forward and option contracts to offset the foreign exchange risk on assets and liabilities denominated in currencies other than the functional currency of the subsidiary. These forward and option 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 and option 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 \$285 million and \$136 million as of December 31, 2021 and 2022, respectively, after consideration of the effect of foreign exchange contracts in place for the years ended December 31, 2021 and 2022.

We use foreign currency forward 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 forward and option contracts reduce the foreign currency losses related to our earnings. When the U.S. dollar weakens, losses from foreign currency forward and option contracts 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 accumulated other comprehensive income (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, 2021 and 2022, the amount recorded in AOCI related to our cash flow hedges before tax effect would have been approximately \$1.3 billion lower for both December 31, 2021 and 2022. 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 hedges before tax effect would have been approximately \$975 million and \$903 million lower as of December 31, 2021 and 2022, respectively. 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 government bonds, corporate debt securities, mortgage-backed and asset-backed securities, money market and other funds, time deposits, and interest rate derivatives. 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, 2021 and 2022 are shown below (in millions):

	As of December 31,		12-Month Average As of December 31,	
	2021	2022	2021	2022
Risk category - interest rate	\$ 139	\$ 256	\$ 148	\$ 198

Actual future gains and losses associated with our marketable debt security portfolio may differ materially from the sensitivity analyses performed as of December 31, 2021 and 2022 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 \$7.8 billion and \$5.2 billion of our investments as of December 31, 2021 and 2022, respectively. A hypothetical adverse price change of 10% on our December 31, 2022 balance would decrease the fair value of marketable equity securities by \$516 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. Valuations of our equity investments in private companies are inherently more complex due to the lack of readily available market data and observable transactions at lower valuations could result in significant losses. In addition, global economic conditions could result in additional volatility. 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. Changes in the valuation of non-marketable equity securities may not directly correlate with changes in valuation of marketable equity securities. As of December 31, 2021 and 2022, the carrying value of our non-marketable equity securities, which were accounted for under the measurement alternative, was \$27.6 billion and \$28.5 billion, respectively.

The carrying values of our equity method investments, which totaled approximately \$1.5 billion as of December 31, 2021 and 2022, 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

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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, 2021 and 2022, 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, 2022, 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, 2021 and 2022, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022, 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, 2022, 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 2, 2023 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 account or disclosure to which it relates.

LOSS CONTINGENCIES

Description of the Matter	The Company is regularly subject to claims, lawsuits, regulatory and government investigations, other proceedings, and consent orders involving competition, intellectual property, data privacy and security, 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 "Commitments and contingencies" such claims, lawsuits, regulatory and government investigations, other proceedings, and consent orders could result in adverse consequences. 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.
How We Addressed the Matter in Our Audit	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. 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.

/S/ Ernst & Young LLP

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

San Jose, California
February 2, 2023

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, 2022, 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, 2022, 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 2022 consolidated financial statements of the Company and our report dated February 2, 2023 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 2, 2023

Alphabet Inc.

CONSOLIDATED BALANCE SHEETS

(in millions, except par value per share amounts)	As of December 31,	
	2021	2022
Assets		
Current assets:		
Cash and cash equivalents	\$ 20,945	\$ 21,879
Marketable securities	118,704	91,883
Total cash, cash equivalents, and marketable securities	139,649	113,762
Accounts receivable, net	39,304	40,258
Inventory	1,170	2,670
Other current assets	8,020	8,105
Total current assets	188,143	164,795
Non-marketable securities	29,549	30,492
Deferred income taxes	1,284	5,261
Property and equipment, net	97,599	112,668
Operating lease assets	12,959	14,381
Intangible assets, net	1,417	2,084
Goodwill	22,956	28,960
Other non-current assets	5,361	6,623
Total assets	\$ 359,268	\$ 365,264
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	\$ 6,037	\$ 5,128
Accrued compensation and benefits	13,889	14,028
Accrued expenses and other current liabilities	32,044	37,866
Accrued revenue share	8,996	8,370
Deferred revenue	3,288	3,908
Total current liabilities	64,254	69,300
Long-term debt	14,817	14,701
Deferred revenue, non-current	535	599
Income taxes payable, non-current	9,176	9,258
Deferred income taxes	5,257	514
Operating lease liabilities	11,389	12,501
Other long-term liabilities	2,205	2,247
Total liabilities	107,633	109,120
Commitments and contingencies (Note 10)		
Stockholders' equity:		
Preferred stock, \$0.001 par value per share, 100 shares authorized; no shares issued and outstanding	0	0
Class A, Class B, and Class C stock and additional paid-in capital, \$0.001 par value per share: 300,000 shares authorized (Class A 180,000, Class B 60,000, Class C 60,000); 13,242 (Class A 6,015, Class B 893, Class C 6,334) and 12,849 (Class A 5,964, Class B 883, Class C 6,002) shares issued and outstanding	61,774	68,184
Accumulated other comprehensive income (loss)	(1,623)	(7,603)
Retained earnings	191,484	195,563
Total stockholders' equity	251,635	256,144
Total liabilities and stockholders' equity	\$ 359,268	\$ 365,264

See accompanying notes.

Alphabet Inc.

CONSOLIDATED STATEMENTS OF INCOME

(In millions, except per share amounts)	Year Ended December 31,		
	2020	2021	2022
Revenues	\$ 182,527	\$ 257,637	\$ 282,836
Costs and expenses:			
Cost of revenues	84,732	110,939	126,203
Research and development	27,573	31,562	39,500
Sales and marketing	17,946	22,912	26,567
General and administrative	11,052	13,510	15,724
Total costs and expenses	141,303	178,923	207,994
Income from operations	41,224	78,714	74,842
Other income (expense), net	6,858	12,020	(3,514)
Income before income taxes	48,082	90,734	71,328
Provision for income taxes	7,813	14,701	11,356
Net income	\$ 40,269	\$ 76,033	\$ 59,972
Basic net income per share of Class A, Class B, and Class C stock	\$ 2.96	\$ 5.69	\$ 4.59
Diluted net income per share of Class A, Class B, and Class C stock	\$ 2.93	\$ 5.61	\$ 4.56

See accompanying notes.

Alphabet Inc.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

(In millions)	Year Ended December 31,		
	2020	2021	2022
Net income	\$ 40,269	\$ 76,033	\$ 59,972
Other comprehensive income (loss):			
Change in foreign currency translation adjustment	1,139	(1,442)	(1,836)
Available-for-sale investments:			
Change in net unrealized gains (losses)	1,313	(1,312)	(4,720)
Less: reclassification adjustment for net (gains) losses included in net income	(513)	(64)	1,007
Net change, net of income tax benefit (expense) of \$(230), \$394, and \$1,056	800	(1,376)	(3,713)
Cash flow hedges:			
Change in net unrealized gains (losses)	42	716	1,275
Less: reclassification adjustment for net (gains) losses included in net income	(116)	(154)	(1,706)
Net change, net of income tax benefit (expense) of \$11, \$(122), and \$110	(74)	562	(431)
Other comprehensive income (loss)	1,865	(2,256)	(5,980)
Comprehensive income	\$ 42,134	\$ 73,777	\$ 53,992

See accompanying notes.

Alphabet Inc.

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(In millions)	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, 2019	13,767	\$ 50,552	\$ (1,232)	\$ 152,122	\$ 201,442
Stock issued	167	168	0	0	168
Stock-based compensation expense	0	13,123	0	0	13,123
Tax withholding related to vesting of restricted stock units and other	0	(5,969)	0	0	(5,969)
Repurchases of stock	(430)	(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	13,504	58,510	633	163,401	222,544
Stock issued	145	12	0	0	12
Stock-based compensation expense	0	15,539	0	0	15,539
Tax withholding related to vesting of restricted stock units and other	0	(10,273)	0	0	(10,273)
Repurchases of stock	(407)	(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	13,242	61,774	(1,623)	191,484	251,635
Stock issued	137	8	0	0	8
Stock-based compensation expense	0	19,525	0	0	19,525
Tax withholding related to vesting of restricted stock units and other	0	(9,754)	0	(1)	(9,755)
Repurchases of stock	(530)	(3,404)	0	(55,892)	(59,296)
Sale of interest in consolidated entities	0	35	0	0	35
Net income	0	0	0	59,972	59,972
Other comprehensive income (loss)	0	0	(5,980)	0	(5,980)
Balance as of December 31, 2022	12,849	\$ 68,184	\$ (7,603)	\$ 195,563	\$ 256,144

See accompanying notes.

Alphabet Inc.

CONSOLIDATED STATEMENTS OF CASH FLOWS

(In millions)	Year Ended December 31,		
	2020	2021	2022
Operating activities			
Net income	\$ 40,269	\$ 76,033	\$ 59,972
Adjustments:			
Depreciation and impairment of property and equipment	12,905	11,555	15,287
Amortization and impairment of intangible assets	792	886	641
Stock-based compensation expense	12,991	15,376	19,362
Deferred income taxes	1,390	1,808	(8,081)
(Gain) loss on debt and equity securities, net	(6,317)	(12,270)	5,519
Other	1,267	(213)	1,030
Changes in assets and liabilities, net of effects of acquisitions:			
Accounts receivable, net	(6,524)	(9,095)	(2,317)
Income taxes, net	1,209	(625)	584
Other assets	(1,330)	(1,846)	(5,046)
Accounts payable	694	283	707
Accrued expenses and other liabilities	5,504	7,304	3,915
Accrued revenue share	1,639	1,682	(445)
Deferred revenue	635	774	367
Net cash provided by operating activities	65,124	91,652	91,495
Investing activities			
Purchases of property and equipment	(22,281)	(24,640)	(31,485)
Purchases of marketable securities	(136,576)	(135,196)	(78,874)
Maturities and sales of marketable securities	132,906	128,294	97,822
Purchases of non-marketable securities	(7,175)	(2,838)	(2,531)
Maturities and sales of non-marketable securities	1,023	934	150
Acquisitions, net of cash acquired, and purchases of intangible assets	(738)	(2,618)	(6,969)
Other investing activities	68	541	1,589
Net cash used in investing activities	(32,773)	(35,523)	(20,298)
Financing activities			
Net payments related to stock-based award activities	(5,720)	(10,162)	(9,300)
Repurchases of stock	(31,149)	(50,274)	(59,296)
Proceeds from issuance of debt, net of costs	11,761	20,199	52,872
Repayments of debt	(2,100)	(21,435)	(54,068)
Proceeds from sale of interest in consolidated entities, net	2,800	310	35
Net cash used in financing activities	(24,408)	(61,362)	(69,757)
Effect of exchange rate changes on cash and cash equivalents	24	(287)	(506)
Net increase (decrease) in cash and cash equivalents	7,967	(5,520)	934
Cash and cash equivalents at beginning of period	18,498	26,465	20,945
Cash and cash equivalents at end of period	\$ 26,465	\$ 20,945	\$ 21,879
Supplemental disclosures of cash flow information			
Cash paid for income taxes, net of refunds	\$ 4,990	\$ 13,412	\$ 18,892

See accompanying notes.

— Alphabet Inc.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1. Summary of Significant Accounting Policies

Nature of Operations

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.

We generate revenues by delivering relevant, cost-effective online advertising; cloud-based solutions that provide enterprise customers with infrastructure and platform services as well as communication and collaboration tools; sales of other products and services, such as apps and in-app purchases, and hardware; and fees received for subscription-based products.

Basis of Consolidation

The consolidated financial statements of Alphabet include the accounts of Alphabet and entities consolidated under the variable interest and voting models. 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. 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; inventory; 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 2023, we completed an assessment of the useful lives of our servers and network equipment and adjusted the estimated useful life of our servers from four years to six years and the estimated useful life of certain network equipment from five years to six years. This change in accounting estimate is effective beginning in fiscal year 2023.

Stock Split Effected in the Form of a 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 had a record date of July 1, 2022 and an effective date of July 15, 2022. The par value per share of our Class A, Class B, and Class C stock remains unchanged at \$0.001 per share after the Stock Split. All prior period references made to share or per share amounts in the accompanying consolidated financial statements and applicable disclosures prior to the effective date have been retroactively adjusted to reflect the effects of the Stock Split.

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 communication and 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;
- hardware, which includes sales of Fitbit wearable devices, Google Nest home products, and Pixel devices;
- YouTube non-advertising, which includes subscription revenues from services such as YouTube Premium and YouTube TV; and
- other products and services.

We report revenues from Google Play app sales and in-app purchases 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.

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 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 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, 2020, 2021, and 2022, advertising and promotional expenses totaled approximately \$5.4 billion, \$7.9 billion, and \$9.2 billion, respectively.

Performance Fees

Performance fees refer to compensation arrangements with payouts based on realized returns from certain investments. We record compensation expense based on the estimated payouts on an ongoing basis, which may result in expense recognized before investment returns are realized and compensation is paid 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. The determination of fair value involves the use of appropriate valuation methods and relevant inputs into valuation models.

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.

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 effective maturities of three months or less from the date of purchase as cash equivalents and those with effective 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 effective 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. All other non-marketable equity securities that we hold 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 effective 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. Additionally, accounts receivable includes amounts for services performed in advance of the right to invoice 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, and reasonable and supportable forecasts of future economic conditions.

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, whether the arrangements and each component of the arrangements should be accounted for as separate transactions under the applicable GAAP, as well as the determination of the value of the components of the arrangements, including the fair value of the investments.

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 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. Construction in progress is the construction or development of property and equipment that have not yet been placed in service.

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. Land is not depreciated. 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. Depreciation for buildings, information technology assets, leasehold improvements, and furniture and fixtures commences once they are ready for our intended use.

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 Sheets. 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, and are subsequently removed from the presentation of gross intangible assets and accumulated amortization once they are fully amortized.

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 have elected to account for the tax effects of the global intangible low tax Income provision as a current period expense.

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, except for revenue contracts acquired, which are recognized in accordance with our revenue recognition policy. 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

Disaggregated Revenues

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

	Year Ended December 31,		
	2020	2021	2022
Google Search & other	\$ 104,062	\$ 148,951	\$ 162,450
YouTube ads	19,772	28,845	29,243
Google Network	23,090	31,701	32,780
Google advertising	146,924	209,497	224,473
Google other	21,711	28,032	29,055
Google Services total	168,635	237,529	253,528
Google Cloud	13,059	19,206	26,280
Other Bets	657	753	1,068
Hedging gains (losses)	176	149	1,960
Total revenues	\$ 182,527	\$ 257,637	\$ 282,836

No individual customer or groups of affiliated customers represented more than 10% of our revenues in 2020, 2021, or 2022.

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

	Year Ended December 31,					
	2020		2021		2022	
United States	\$ 85,014	47%	\$ 117,854	46%	\$ 134,814	48%
EMEA ⁽¹⁾	55,370	30	79,107	31	82,062	29
APAC ⁽¹⁾	32,550	18	46,123	18	47,024	16
Other Americas ⁽¹⁾	9,417	5	14,404	5	16,976	6
Hedging gains (losses)	176	0	149	0	1,960	1
Total revenues	\$ 182,527	100%	\$ 257,637	100%	\$ 282,836	100%

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

Revenue Backlog

As of December 31, 2022, we had \$64.3 billion of remaining performance obligations ("revenue backlog"), primarily related to Google Cloud. Our revenue backlog represents commitments in customer contracts for future services that have not yet been recognized as revenue. The amount and timing of revenue recognition for these commitments is largely driven by our ability to deliver in accordance with relevant contract terms and when our customers utilize services, which could affect our estimate of revenue backlog and when we expect to recognize such as revenue. We expect to recognize approximately half of the revenue backlog as revenues over the next 24 months with the remaining to be recognized thereafter. 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.

Deferred Revenue

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, 2021 was \$3.8 billion, of which \$2.5 billion was recognized as revenues for the year ending December 31, 2022.

Note 3. Financial Instruments

Fair Value Measurements

INVESTMENTS MEASURED AT FAIR VALUE ON A RECURRING BASIS

Cash, cash equivalents, and marketable equity securities are measured at fair value and classified within Level 1 and Level 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.

Debt securities are classified 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.

The following tables summarize our cash, cash equivalents, and marketable securities measured at fair value on a recurring basis (in millions):

As of December 31, 2021								
	Fair Value Hierarchy	Adjusted Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value	Cash and Cash Equivalents	Marketable Securities	
Fair value changes recorded in other comprehensive income								
Time deposits ⁽¹⁾	Level 2	\$ 5,133	\$ 0	\$ 0	\$ 5,133	\$ 5,133	\$ 0	
Government bonds	Level 2	53,288	258	(238)	53,308	5	53,303	
Corporate debt securities	Level 2	35,605	194	(223)	35,576	12	35,564	
Mortgage-backed and asset-backed securities	Level 2	18,829	96	(112)	18,813	0	18,813	
Total investments with fair value change reflected in Other Comprehensive Income ⁽²⁾		\$ 112,855	\$ 548	\$ (573)	\$ 112,830	\$ 5,150	\$ 107,680	
Fair value adjustments recorded in net income								
Money market funds	Level 1				\$ 7,499	\$ 7,499	\$ 0	
Current marketable equity securities ⁽³⁾	Level 1				5,998	0	5,998	
Mutual funds	Level 2				351	0	351	
Government bonds	Level 2				1,165	0	1,165	
Corporate debt securities	Level 2				2,503	0	2,503	
Mortgage-backed and asset-backed securities	Level 2				1,007	0	1,007	
Total investments with fair value change recorded in Net Income					\$ 18,523	\$ 7,499	\$ 11,024	
Cash					0	8,296	0	
Total		\$ 112,855	\$ 548	\$ (573)	\$ 131,353	\$ 20,945	\$ 118,704	

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

(2) Represents gross unrealized gains and losses for debt securities recorded to AOCI.

(3) The long-term portion of marketable equity securities (subject to long-term lock-up restrictions) of \$1.4 billion as of December 31, 2021 is included within other non-current assets.

As of December 31, 2022								
	Fair Value Hierarchy	Adjusted Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value	Cash and Cash Equivalents	Marketable Securities	
Fair value changes recorded in other comprehensive income								
Time deposits ⁽¹⁾	Level 2	\$ 5,297	\$ 0	\$ 0	\$ 5,297	\$ 5,293	\$ 4	
Government bonds	Level 2	41,036	64	(2,045)	39,055	283	38,772	
Corporate debt securities	Level 2	28,578	8	(1,569)	27,017	1	27,016	
Mortgage-backed and asset-backed securities	Level 2	16,176	5	(1,242)	14,939	0	14,939	
Total investments with fair value change reflected in Other Comprehensive Income ⁽²⁾		\$ 91,087	\$ 77	\$ (4,856)	\$ 86,308	\$ 5,577	\$ 80,731	
Fair value adjustments recorded in net income								
Money market funds	Level 1				\$ 7,234	\$ 7,234	\$ 0	
Current marketable equity securities ⁽³⁾	Level 1				4,013	0	4,013	
Mutual funds	Level 2				339	0	339	
Government bonds	Level 2				1,877	440	1,437	
Corporate debt securities	Level 2				3,744	65	3,679	
Mortgage-backed and asset-backed securities	Level 2				1,686	2	1,684	
Total investments with fair value change recorded in Net Income					\$ 18,893	\$ 7,741	\$ 11,152	
Cash					0	8,561	0	
Total		\$ 91,087	\$ 77	\$ (4,856)	\$ 105,201	\$ 21,879	\$ 91,883	

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

(2) Represents gross unrealized gains and losses for debt securities recorded to AOCI.

(3) The long-term portion of marketable equity securities (subject to long-term lock-up restrictions) of \$803 million as of December 31, 2022 is included within other non-current assets.

INVESTMENTS MEASURED AT FAIR VALUE ON A NONRECURRING BASIS

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. 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.

During the year ended December 31, 2022, included in the \$28.5 billion of non-marketable equity securities held as of the end of the period, \$14.1 billion were measured at fair value and primarily classified as Level 2 investments.

Debt Securities

The following table summarizes the estimated fair value of investments in available-for-sale marketable debt securities by effective contractual maturity dates (in millions):

	As of December 31, 2022
Due in 1 year or less	\$ 8,170
Due in 1 year through 5 years	51,698
Due in 5 years through 10 years	16,083
Due after 10 years	11,580
Total	<u>\$ 87,531</u>

The following tables present fair values and gross unrealized losses recorded to AOCI, 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, 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>

	As of December 31, 2022					
	Less than 12 Months		12 Months or Greater		Total	
	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
Government bonds	\$ 21,039	\$ (1,004)	\$ 13,438	\$ (1,041)	\$ 34,477	\$ (2,045)
Corporate debt securities	11,228	(440)	15,125	(1,052)	26,353	(1,492)
Mortgage-backed and asset-backed securities	7,725	(585)	6,964	(657)	14,689	(1,242)
Total	<u>\$ 39,992</u>	<u>\$ (2,029)</u>	<u>\$ 35,527</u>	<u>\$ (2,750)</u>	<u>\$ 75,519</u>	<u>\$ (4,779)</u>

We determine realized gains or losses on the sale or extinguishment of debt securities on a specific identification method. The following table summarizes gains and losses for debt securities, reflected as a component of other income (expense), net (in millions):

	Year Ended December 31,		
	2020	2021	2022
Unrealized gain (loss) on fair value option debt securities ⁽¹⁾	\$ 86	\$ (122)	\$ (557)
Gross realized gain on debt securities	899	432	103
Gross realized loss on debt securities	(184)	(329)	(1,588)
(Increase)/decrease in allowance for credit losses	(76)	(91)	(22)
Total gain (loss) on debt securities recognized in other income (expense), net	<u>\$ 725</u>	<u>\$ (110)</u>	<u>\$ (2,064)</u>

(1) Accumulated unrealized net gains (losses) related to debt securities still held where we have elected the fair value option were \$87 million, \$(35) million, and \$(592) million as of December 31, 2020, 2021, and 2022, respectively.

Equity Investments

The carrying value of equity securities is measured as the total initial cost plus the cumulative net gain (loss). 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.

The carrying values for marketable and non-marketable equity securities are summarized below (in millions):

	As of December 31, 2021			As of December 31, 2022		
	Marketable Equity Securities	Non-Marketable Equity Securities	Total	Marketable Equity Securities	Non-Marketable Equity Securities	Total
Total initial cost	\$ 4,211	\$ 15,135	\$ 19,346	\$ 5,764	\$ 16,157	\$ 21,921
Cumulative net gain (loss) ⁽¹⁾	3,587	12,436	16,023	(608)	12,372	11,764
Carrying value	\$ 7,798	\$ 27,571	\$ 35,369	\$ 5,156	\$ 28,529	\$ 33,685

(1) Non-marketable equity securities cumulative net gain (loss) is comprised of \$14.1 billion gains and \$1.7 billion losses (including impairments) as of December 31, 2021 and \$16.8 billion gains and \$4.5 billion losses (including impairments) as of December 31, 2022.

GAINS AND LOSSES ON MARKETABLE AND NON-MARKETABLE EQUITY SECURITIES

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

	Year Ended December 31,		
	2020	2021	2022
Realized net gain (loss) on equity securities sold during the period	\$ 1,339	\$ 1,196	\$ (442)
Unrealized net gain (loss) on marketable equity securities	2,722	1,335	(3,242)
Unrealized net gain (loss) on non-marketable equity securities ⁽¹⁾	1,531	9,849	229
Total gain (loss) on equity securities in other income (expense), net	\$ 5,592	\$ 12,380	\$ (3,455)

(1) Unrealized gain (loss) on non-marketable equity securities accounted for under the measurement alternative is comprised of \$3.0 billion, \$10.0 billion, and \$3.3 billion of upward adjustments as of December 31, 2020, 2021, and 2022, respectively, and \$1.5 billion, \$122 million, and \$3.0 billion of downward adjustments (including impairments) as of December 31, 2020, 2021, and 2022, respectively.

In the table above, realized 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 sold during the period. While these net gains (losses) 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 (losses) on the securities sold during the period. Cumulative net gains (losses) 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,	
	2021	2022
Total sale price	\$ 5,604	\$ 1,784
Total initial cost	1,206	937
Cumulative net gains (losses) ⁽¹⁾	\$ 4,398	\$ 847

(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.

EQUITY SECURITIES ACCOUNTED FOR UNDER THE EQUITY METHOD

As of December 31, 2021 and 2022, equity securities accounted for under the equity method had a carrying value of approximately \$1.5 billion for both years. 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 use derivative instruments to manage risks relating to our ongoing business operations. The primary risk managed 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 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 and present all other derivatives at gross fair values. The accounting treatment for derivatives is based on the intended use and hedge designation.

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 forward points and time value from our assessment of hedge effectiveness and amortize them on a straight-line basis over the life of the hedging instrument in revenues. The difference between fair value changes of the excluded component and the amount amortized to revenues is recorded in AOCI.

As of December 31, 2022, the net accumulated gain on our foreign currency cash flow hedges before tax effect was \$171 million, which is expected to be reclassified from AOCI into revenues 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 marketable securities 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 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 forward points from the assessment of hedge effectiveness and recognize changes in the excluded component in other income (expense), net.

OTHER DERIVATIVES

We enter into foreign currency forward and option contracts that are not designated as hedging instruments 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 derivatives that are not designated as accounting hedges are primarily recorded 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. From time to time, we enter into derivatives to hedge the market price risk on certain of our marketable equity securities. Gains and losses arising from other derivatives are primarily reflected within the "other" component of other income (expense), net. See Note 7 for further details.

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

	As of December 31,	
	2021	2022
Derivatives designated as hedging instruments:		
Foreign exchange contracts		
Cash flow hedges	\$ 16,362	\$ 15,972
Fair value hedges	\$ 2,556	\$ 2,117
Net investment hedges	\$ 10,159	\$ 8,751
Derivatives not designated as hedging instruments:		
Foreign exchange contracts	\$ 41,031	\$ 34,979
Other contracts	\$ 4,275	\$ 7,932

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

	As of December 31, 2021		As of December 31, 2022	
	Assets ⁽¹⁾	Liabilities ⁽²⁾	Assets ⁽¹⁾	Liabilities ⁽²⁾
Derivatives designated as hedging instruments:				
Foreign exchange contracts	\$ 867	\$ 8	\$ 271	\$ 556
Derivatives not designated as hedging instruments:				
Foreign exchange contracts	42	452	365	207
Other contracts	52	121	40	47
Total derivatives not designated as hedging instruments	94	573	405	254
Total	\$ 961	\$ 581	\$ 676	\$ 810

(1) Derivative assets are recorded as other current and non-current assets in the Consolidated Balance Sheets.

(2) Derivative liabilities are recorded as accrued expenses and other liabilities, current and non-current in the Consolidated Balance Sheets.

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

	Gains (Losses) Recognized in OCI on Derivatives Before Tax Effect		
	Year Ended December 31,		
	2020	2021	2022
Derivatives in Cash Flow Hedging Relationship:			
Foreign exchange contracts			
Amount included in the assessment of effectiveness	\$ 102	\$ 806	\$ 1,699
Amount excluded from the assessment of effectiveness	(37)	48	(188)
Derivatives in Net Investment Hedging Relationship:			
Foreign exchange contracts			
Amount included in the assessment of effectiveness	(851)	754	608
Total	\$ (786)	\$ 1,608	\$ 2,119

The table below presents the gains (losses) of our derivatives on the Consolidated Statements of Income: (in millions):

	Gains (Losses) Recognized in Income					
	Year Ended December 31,					
	2020		2021		2022	
	Revenues	Other income (expense), net	Revenues	Other income (expense), net	Revenues	Other income (expense), net
Total amounts in the Consolidated Statements of Income	\$ 182,527	\$ 6,858	\$ 257,637	\$ 12,020	\$ 282,836	\$ (3,514)
Effect of cash flow hedges:						
Foreign exchange contracts						
Amount reclassified from AOCI to income	\$ 144	\$ 0	\$ 165	\$ 0	\$ 2,046	\$ 0
Amount excluded from the assessment of effectiveness (amortized)	33	0	(16)	0	(85)	0
Effect of fair value hedges:						
Foreign exchange contracts						
Hedged items	0	18	0	(95)	0	(162)
Derivatives designated as hedging instruments	0	(18)	0	95	0	163
Amount excluded from the assessment of effectiveness	0	4	0	8	0	16
Effect of net investment hedges:						
Foreign exchange contracts						
Amount excluded from the assessment of effectiveness	0	151	0	82	0	171
Effect of non designated hedges:						
Foreign exchange contracts	0	718	0	(860)	0	(395)
Other contracts	0	(906)	0	101	0	144
Total gains (losses)	\$ 177	\$ (33)	\$ 149	\$ (669)	\$ 1,961	\$ (63)

Offsetting of Derivatives

We enter into master netting arrangements and collateral security arrangements to reduce credit risk. 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.

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):

As of December 31, 2021							
	Gross Amounts Recognized	Gross Amounts Offset in the Consolidated Balance Sheets	Net Amounts Presented in the Consolidated Balance Sheets	Financial Instruments ⁽¹⁾	Gross Amounts Not Offset in the Consolidated Balance Sheets, but Have Legal Rights to Offset		
						Cash and Non-Cash Collateral Received or Pledged	Net Amounts
Derivatives assets	\$ 999	\$ (38)	\$ 961	\$ (434)	\$ (406)	\$	\$ 121
Derivatives liabilities	\$ 619	\$ (38)	\$ 581	\$ (434)	\$ (114)	\$	\$ 33

As of December 31, 2022							
	Gross Amounts Recognized	Gross Amounts Offset in the Consolidated Balance Sheets	Net Amounts Presented in the Consolidated Balance Sheets	Financial Instruments ⁽¹⁾	Gross Amounts Not Offset in the Consolidated Balance Sheets, but Have Legal Rights to Offset		
						Cash and Non-Cash Collateral Received or Pledged	Net Amounts
Derivatives assets	\$ 760	\$ (84)	\$ 676	\$ (463)	\$ (132)	\$	\$ 81
Derivatives liabilities	\$ 894	\$ (84)	\$ 810	\$ (463)	\$ (28)	\$	\$ 319

(1) The balances as of December 31, 2021 and 2022 were related to derivatives allowed to be net settled 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 2023 and 2063.

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

	Year Ended December 31,		
	2020	2021	2022
Operating lease cost	\$ 2,267	\$ 2,699	\$ 2,900
Variable lease cost	619	726	838
Total operating lease cost	\$ 2,886	\$ 3,425	\$ 3,738

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

	Year Ended December 31,		
	2020	2021	2022
Cash payments for operating leases	\$ 2,004	\$ 2,489	\$ 2,722
New operating lease assets obtained in exchange for operating lease liabilities	\$ 2,765	\$ 2,951	\$ 4,383

As of December 31, 2022, our operating leases had a weighted average remaining lease term of eight years and a weighted average discount rate of 2.8%. Future lease payments under operating leases as of December 31, 2022 were as follows (in millions):

2023	\$ 2,955
2024	2,771
2025	2,377
2026	1,953
2027	1,502
Thereafter	5,882
Total future lease payments	17,440
Less imputed interest	(2,462)
Total lease liability balance	\$ 14,978

As of December 31, 2022, we have entered into leases that have not yet commenced with short-term and long-term future lease payments of \$630 million and \$3.1 billion that are not yet recorded on our Consolidated Balance Sheets. These leases will commence between 2023 and 2026 with non-cancelable lease terms between 1 and 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, 2021 and 2022, assets that can only be used to settle obligations of these VIEs were \$6.0 billion and \$4.1 billion, respectively, and the liabilities for which creditors only have recourse to the VIEs were \$2.5 billion and \$2.6 billion, respectively. We may continue to fund ongoing operations of certain VIEs that are included within Other Bets.

Total noncontrolling interests (NCI) in our consolidated subsidiaries were \$4.3 billion and \$3.8 billion as of December 31, 2021 and 2022, respectively, of which \$1.1 billion is redeemable noncontrolling interest (RNCI) for both periods. 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 OI&E. See Note 7 for further details on OI&E.

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 \$2.7 billion and \$2.9 billion, respectively, as of December 31, 2021 and \$2.7 billion and \$2.8 billion, respectively, as of December 31, 2022.

Note 6. Debt

Short-Term Debt

We have a debt financing program of up to \$10.0 billion through the issuance of commercial paper. Net proceeds from this program are used for general corporate purposes. We had no commercial paper outstanding as of December 31, 2021 and 2022.

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,	
				2021	2022
Debt					
2014-2020 Notes issuances	2024 - 2060	0.45% - 3.38%	0.57% - 3.38%	\$ 13,000	\$ 13,000
Future finance lease payments, net and other ⁽¹⁾				2,086	2,142
Total debt				15,086	15,142
Unamortized discount and debt issuance costs				(156)	(143)
Less: current portion of future finance lease payments, net and other current debt ⁽¹⁾⁽²⁾				(113)	(298)
Total long-term debt				\$ 14,817	\$ 14,701

(1) Future finance lease payments are net of imputed interest.

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

The notes in the table above are 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 was approximately \$12.4 billion and \$9.9 billion as of December 31, 2021 and December 31, 2022, 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, 2022, 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):

2023	\$ 221
2024	1,156
2025	1,159
2026	2,163
2027	1,166
Thereafter	9,447
Total	\$ 15,312

Credit Facility

As of December 31, 2022, we had \$10.0 billion of revolving credit facilities, \$4.0 billion expiring in April 2023 and \$6.0 billion expiring in April 2026. The interest rates for all 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 were outstanding under the credit facilities as of December 31, 2021 and 2022.

Note 7. Supplemental Financial Statement Information

Accounts Receivable

The allowance for credit losses on accounts receivable was \$550 million and \$754 million as of December 31, 2021 and 2022, respectively.

Property and Equipment, Net

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

	As of December 31,	
	2021	2022
Land and buildings	\$ 58,881	\$ 66,897
Information technology assets	55,606	66,267
Construction in progress	23,172	27,657
Leasehold improvements	9,146	10,575
Furniture and fixtures	208	314
Property and equipment, gross	147,013	171,710
Less: accumulated depreciation	(49,414)	(59,042)
Property and equipment, net	\$ 97,599	\$ 112,668

Accrued expenses and other current liabilities

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

	As of December 31,	
	2021	2022
European Commission fines ⁽¹⁾	\$ 9,799	\$ 9,106
Accrued customer liabilities	3,505	3,619
Accrued purchases of property and equipment	2,415	3,019
Current operating lease liabilities	2,189	2,477
Other accrued expenses and current liabilities	14,136	19,645
Accrued expenses and other current liabilities	\$ 32,044	\$ 37,866

(1) While each EC decision is under appeal, the fines are included 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. Amounts include 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, 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)
Other comprehensive income (loss) before reclassifications	(1,836)	(4,720)	1,463	(5,093)
Amounts excluded from the assessment of hedge effectiveness recorded in AOCI	0	0	(188)	(188)
Amounts reclassified from AOCI	0	1,007	(1,706)	(699)
Other comprehensive income (loss)	(1,836)	(3,713)	(431)	(5,980)
Balance as of December 31, 2022	\$ (4,142)	\$ (3,477)	\$ 16	\$ (7,603)

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

		Gains (Losses) Reclassified from AOCI to the Consolidated Statements of Income		
		Year Ended December 31,		
AOCI Components	Location	2020	2021	2022
Unrealized gains (losses) on available-for-sale investments				
	Other income (expense), net	\$ 650	\$ 82	\$ (1,291)
	Benefit (provision) for income taxes	(137)	(18)	284
	Net of income tax	513	64	(1,007)
Unrealized gains (losses) on cash flow hedges				
Foreign exchange contracts	Revenue	144	165	2,046
Interest rate contracts	Other income (expense), net	6	6	6
	Benefit (provision) for income taxes	(34)	(17)	(346)
	Net of income tax	116	154	1,706
Total amount reclassified, net of income tax		\$ 629	\$ 218	\$ 699

Other Income (Expense), Net

Components of OI&E were as follows (in millions):

	Year Ended December 31,		
	2020	2021	2022
Interest income	\$ 1,865	\$ 1,499	\$ 2,174
Interest expense ⁽¹⁾	(135)	(346)	(357)
Foreign currency exchange gain (loss), net	(344)	(240)	(654)
Gain (loss) on debt securities, net	725	(110)	(2,064)
Gain (loss) on equity securities, net	5,592	12,380	(3,455)
Performance fees	(609)	(1,908)	798
Income (loss) and impairment from equity method investments, net	401	334	(337)
Other	(637)	411	381
Other income (expense), net	\$ 6,858	\$ 12,020	\$ (3,514)

(1) Interest expense is net of interest capitalized of \$218 million, \$163 million, and \$128 million for the years ended December 31, 2020, 2021, and 2022, respectively.

Note 8. Acquisitions

Mandiant Acquisition

On September 12, 2022 we closed the acquisition of Mandiant for a total purchase price of \$6.1 billion, including cash and debt. The purchase price excludes post acquisition compensation arrangements. Mandiant's dynamic cyber defense, threat intelligence and incident response services are expected to enhance Google Cloud's security offerings. The financial results of Mandiant have been included within the Google Cloud segment as of the close of the acquisition.

The purchase price was allocated as follows (in millions):

Intangible assets	\$ 840
Goodwill ⁽¹⁾	4,772
Net assets acquired ⁽²⁾	489
Total purchase price	\$ 6,101

(1) Goodwill was recorded in the Google Cloud segment and primarily attributable to synergies expected to arise after the acquisition. Goodwill is not deductible for tax purposes.

(2) Includes \$706 million of acquired cash.

Intangible assets acquired as of the acquisition date were as follows:

	Amount (in millions)	Weighted-Average Useful Life (in years)
Patents and developed technology	\$ 349	4.8
Customer relationships	366	8.0
Trade names and other	125	5.9
Total intangible assets	\$ 840	

Note 9. Goodwill and Other Intangible Assets

Goodwill

Changes in the carrying amount of goodwill for the years ended December 31, 2021 and 2022 were as follows (in millions):

	Google Services	Google Cloud	Other Bets	Total
Balance as of December 31, 2020	\$ 18,517	\$ 1,957	\$ 701	\$ 21,175
Acquisitions	1,325	382	103	1,810
Foreign currency translation and other adjustments	(16)	(2)	(11)	(29)
Balance as of December 31, 2021	19,826	2,337	793	22,956
Acquisitions	1,176	4,876	119	6,171
Foreign currency translation and other adjustments	(155)	(8)	(4)	(167)
Balance as of December 31, 2022	\$ 20,847	\$ 7,205	\$ 908	\$ 28,960

Other Intangible Assets

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

	As of December 31, 2021			As of December 31, 2022			Weighted-Average Remaining Useful Life (in years)
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Value	
Patents and developed technology	\$ 4,786	\$ 4,112	\$ 674	\$ 1,164	\$ 354	\$ 810	3.2
Customer relationships	506	140	366	862	235	627	5.0
Trade names and other	534	295	239	527	120	407	6.3
Total definite-lived intangible assets	5,826	4,547	1,279	2,553	709	1,844	
Indefinite-lived intangible assets	138	0	138	240	0	240	
Total intangible assets	\$ 5,964	\$ 4,547	\$ 1,417	\$ 2,793	\$ 709	\$ 2,084	

For the year ended December 31, 2022, \$4.5 billion of intangible assets that were fully amortized have been removed from gross intangible assets and accumulated amortization.

Amortization expense relating to intangible assets was \$774 million, \$875 million, and \$642 million for the years ended December 31, 2020, 2021, and 2022, respectively.

Expected amortization expense of definite-lived intangible assets held as of December 31, 2022 was as follows (in millions):

2023	\$ 463
2024	444
2025	314
2026	235
2027	152
Thereafter	236
	\$ 1,844

Note 10. Commitments and contingencies

Commitments

We have content licensing agreements with future fixed or minimum guaranteed commitments of \$12.3 billion as of December 31, 2022, of which the majority will be paid over seven years commencing in 2023.

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, distribution 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, 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, 2022, we did not have any material indemnification claims that were probable or reasonably possible.

Legal Matters

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.

Certain outstanding matters include speculative, substantial or indeterminate monetary amounts. Significant judgment is required to determine both the likelihood of there being a loss and the estimated amount of a loss related to such matters, and we may be unable to estimate the reasonably possible loss or range of losses. The outcomes of outstanding legal matters are inherently unpredictable and subject to significant uncertainties, and could, either individually or in aggregate, have a material adverse effect.

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

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, and on October 29, 2018, we implemented changes to certain of our Android distribution practices. On September 14, 2022, the General Court reduced the fine from €4.3 billion to €4.1 billion. We subsequently filed an appeal with the European Court of Justice. In 2018, we recognized a charge of \$5.1 billion for the fine, which we reduced by \$217 million in 2022.

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, which remains pending. We recognized a charge of \$1.7 billion for the fine in the first quarter of 2019.

From time to time we are subject to formal and informal inquiries and investigations on various competition matters by regulatory authorities in the U.S., Europe, and other jurisdictions globally. For example:

- 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. Further, in June 2022, the Australian Competition and Consumer Commission (ACCC) and the United Kingdom's Competition and Markets Authority (CMA) each opened an investigation into Search distribution practices.
- On December 16, 2020, a number of state Attorneys General filed an antitrust complaint 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. Additionally, on January 24, 2023, the DOJ, along with a number of state Attorneys General, filed an antitrust complaint alleging that Google's digital advertising technology products violate U.S. antitrust laws. The EC, the CMA, and the ACCC each opened a formal investigation into Google's advertising technology business practices on June 22, 2021, May 25, 2022, and June 29, 2022, respectively.
- On July 7, 2021, a number of state Attorneys General filed an antitrust complaint 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. In May 2022, the EC and the CMA each opened investigations into Google Play's business practices. Korean regulators are investigating Google Play's billing practices, most recently opening a formal review in May 2022 of Google's compliance with the new app store billing regulations.

We believe these complaints are without merit and will defend ourselves vigorously. 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.

OTHER

We are subject to claims, lawsuits, regulatory and government investigations, other proceedings, and consent orders involving competition, intellectual property, data privacy and security, 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 currently have a number of privacy investigations and lawsuits ongoing in multiple jurisdictions. We also periodically have data incidents that we report to relevant regulators as required by law. Such claims, lawsuits, regulatory and government investigations, other proceedings, and consent orders could result in substantial fines and penalties, injunctive relief, ongoing monitoring and auditing 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.

We have ongoing legal matters relating to Russia. For example, civil judgments that include compounding penalties have been imposed upon us in connection with disputes regarding the termination of accounts, including those of sanctioned parties. We do not believe these ongoing legal matters will have a material adverse effect.

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

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.

Stock Split

On July 15, 2022, the company executed a 20-for-one stock split with a record date of July 1, 2022, effected 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. All prior period references made to share or per share amounts in the accompanying consolidated financial statements and applicable disclosures have been retroactively adjusted to reflect the effects of the Stock Split. See Note 1 for further details.

Share Repurchases

In April 2022, the Board of Directors of Alphabet authorized the company to repurchase up to \$70.0 billion of its Class A and Class C shares. As of December 31, 2022, \$28.1 billion remains available for Class A and Class C share repurchases.

The following table presents Class A and Class C shares repurchased and subsequently retired (in millions):

	Year Ended December 31, 2021		Year Ended December 31, 2022	
	Shares	Amount	Shares	Amount
Class A share repurchases	24	\$ 3,399	61	\$ 6,719
Class C share repurchases	383	46,875	469	52,577
Total share repurchases	407	\$ 50,274	530	\$ 59,296

Class A and Class C shares are repurchased 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. Repurchases are 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.

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, 2020, 2021, and 2022, 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 per share amounts):

	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	5,996	924	6,696
Basic net income per share	\$ 2.96	\$ 2.96	\$ 2.96
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	5,996	924	6,696
Weighted-average effect of dilutive securities			
Add:			
Conversion of Class B to Class A shares outstanding	924	0	0
Restricted stock units and other contingently issuable shares	2	0	123
Number of shares used in per share computation	6,922	924	6,819
Diluted net income per share	\$ 2.93	\$ 2.93	\$ 2.93

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	6,006	909	6,438
Basic net income per share	\$ 5.69	\$ 5.69	\$ 5.69
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	6,006	909	6,438
Weighted-average effect of dilutive securities			
Add:			
Conversion of Class B to Class A shares outstanding	909	0	0
Restricted stock units and other contingently issuable shares	0	0	200
Number of shares used in per share computation	6,915	909	6,638
Diluted net income per share	\$ 5.61	\$ 5.61	\$ 5.61

Year Ended December 31,			
2022			
	Class A	Class B	Class C
Basic net income per share:			
Numerator			
Allocation of undistributed earnings	\$ 27,518	\$ 4,072	\$ 28,382
Denominator			
Number of shares used in per share computation	5,994	887	6,182
Basic net income per share	\$ 4.59	\$ 4.59	\$ 4.59
Diluted net income per share:			
Numerator			
Allocation of undistributed earnings for basic computation	\$ 27,518	\$ 4,072	\$ 28,382
Reallocation of undistributed earnings as a result of conversion of Class B to Class A shares	4,072	0	0
Reallocation of undistributed earnings	(230)	(30)	230
Allocation of undistributed earnings	\$ 31,360	\$ 4,042	\$ 28,612
Denominator			
Number of shares used in basic computation	5,994	887	6,182
Weighted-average effect of dilutive securities			
Add:			
Conversion of Class B to Class A shares outstanding	887	0	0
Restricted stock units and other contingently issuable shares	0	0	96
Number of shares used in per share computation	6,881	887	6,278
Diluted net income per share	\$ 4.56	\$ 4.56	\$ 4.56

Note 13. Compensation Plans

Stock Plans

Our stock plans include the Alphabet Amended and Restated 2021 Stock Plan ("Alphabet 2021 Stock Plan") and Other Bet stock-based plans. Under our stock plans, RSUs and other types of awards may be granted. Under the Alphabet 2021 Stock Plan, 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, 2022, there were 706 million shares of Class C stock reserved for future issuance under the Alphabet 2021 Stock Plan.

Stock-Based Compensation

For the years ended December 31, 2020, 2021, and 2022, total stock-based compensation expense was \$13.4 billion, \$15.7 billion, and \$19.5 billion, including amounts associated with awards we expect to settle in Alphabet stock of \$12.8 billion, \$15.0 billion, and \$18.8 billion, respectively.

For the years ended December 31, 2020, 2021, and 2022, 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 \$2.7 billion, \$3.1 billion, and \$3.9 billion, respectively.

For the years ended December 31, 2020, 2021, and 2022, tax benefit realized related to awards vested or exercised during the period was \$3.6 billion, \$5.9 billion, and \$4.7 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, 2022 (in millions, except per share amounts):

	Unvested Restricted Stock Units	
	Number of Shares	Weighted-Average Grant-Date Fair Value
Unvested as of December 31, 2021	338	\$ 81.31
Granted	227	\$ 127.22
Vested	(213)	\$ 87.53
Forfeited/canceled	(28)	\$ 97.10
Unvested as of December 31, 2022	324	\$ 107.98

The weighted-average grant-date fair value of RSUs granted during the years ended December 31, 2020 and 2021 was \$70.40 and \$97.46, respectively. Total fair value of RSUs, as of their respective vesting dates, during the years ended December 31, 2020, 2021, and 2022, were \$17.8 billion, \$28.8 billion, and \$23.9 billion, respectively.

As of December 31, 2022, there was \$32.8 billion of unrecognized compensation cost related to unvested RSUs. This amount is expected to be recognized over a weighted-average period of 2.6 years.

Note 14. Income Taxes

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

	Year Ended December 31,		
	2020	2021	2022
Domestic operations	\$ 37,576	\$ 77,016	\$ 61,307
Foreign operations	10,506	13,718	10,021
Total	\$ 48,082	\$ 90,734	\$ 71,328

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

	Year Ended December 31,		
	2020	2021	2022
Current:			
Federal and state	\$ 4,789	\$ 10,126	\$ 17,120
Foreign	1,687	2,692	2,434
Total	6,476	12,818	19,554
Deferred:			
Federal and state	1,552	2,018	(8,052)
Foreign	(215)	(135)	(146)
Total	1,337	1,883	(8,198)
Provision for income taxes	\$ 7,813	\$ 14,701	\$ 11,356

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

	Year Ended December 31,		
	2020	2021	2022
U.S. federal statutory tax rate	21.0%	21.0%	21.0%
Foreign income taxed at different rates	(0.3)	0.2	3.0
Foreign-derived intangible income deduction	(3.0)	(2.5)	(5.4)
Stock-based compensation expense	(1.7)	(2.5)	(1.2)
Federal research credit	(2.3)	(1.6)	(2.2)
Deferred tax asset valuation allowance	1.4	0.6	0.9
State and local income taxes	1.1	1.0	0.8
Other	0.0	0.0	(1.0)
Effective tax rate	16.2%	16.2%	15.9%

In 2022, there was an increase in the U.S. Foreign Derived Intangible Income tax deduction from the effects of capitalization and amortization of R&D expenses in 2022 as required by the 2017 Tax Cuts and Jobs Act.

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,	
	2021	2022
Deferred tax assets:		
Accruals and reserves not currently deductible	\$ 1,816	\$ 1,956
Tax credits	5,179	6,002
Net operating losses	1,790	2,557
Operating leases	2,503	2,711
Capitalized research and development ⁽¹⁾	1,843	10,381
Other	1,665	3,244
Total deferred tax assets	14,796	26,851
Valuation allowance	(7,129)	(9,553)
Total deferred tax assets net of valuation allowance	7,667	17,298
Deferred tax liabilities:		
Property and equipment, net	(5,237)	(6,607)
Net investment gains	(3,229)	(2,361)
Operating leases	(2,228)	(2,491)
Other	(946)	(1,092)
Total deferred tax liabilities	(11,640)	(12,551)
Net deferred tax assets (liabilities)	\$ (3,973)	\$ 4,747

(1) As required by the 2017 Tax Cuts and Jobs Act, effective January 1, 2022, our research and development expenditures were capitalized and amortized which resulted in substantially higher cash taxes for 2022 with an equal amount of deferred tax benefit.

As of December 31, 2022, our federal, state, and foreign net operating loss carryforwards for income tax purposes were approximately \$6.4 billion, \$14.6 billion, and \$1.8 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 the majority of the 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, 2022, our Federal and California research and development credit carryforwards for income tax purposes were approximately \$400 million and \$5.8 billion, respectively. If not utilized, the Federal R&D credit will begin to expire in 2037 and the California R&D credit can be carried over indefinitely. We believe the majority of the federal tax credit and state tax credit is not likely to be realized.

As of December 31, 2022, our investment tax credit carryforwards for state income tax purposes were approximately \$931 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, 2022, we maintained a valuation allowance with respect to California deferred tax assets, certain federal net operating losses, certain state net operating losses and 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,		
	2020	2021	2022
Beginning gross unrecognized tax benefits	\$ 3,377	\$ 3,837	\$ 5,158
Increases related to prior year tax positions	372	529	253
Decreases related to prior year tax positions	(557)	(263)	(437)
Decreases related to settlement with tax authorities	(45)	(329)	(140)
Increases related to current year tax positions	690	1,384	2,221
Ending gross unrecognized tax benefits	\$ 3,837	\$ 5,158	\$ 7,055

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. The total amount of gross unrecognized tax benefits was \$3.8 billion, \$5.2 billion, and \$7.1 billion as of December 31, 2020, 2021, and 2022, respectively, of which \$2.6 billion, \$3.7 billion, and \$5.3 billion, if recognized, would affect our effective tax rate, respectively.

As of December 31, 2021 and 2022, we accrued \$270 million and \$346 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 2015 through 2021 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 resolutions occur. 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 \$1.8 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, and hardware; and fees received for subscription-based products such as YouTube Premium and YouTube TV.
- Google Cloud includes 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 communication and 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.

As AI is critical to delivering our mission of bringing our breakthrough innovations into the real world, beginning in January 2023, we will update our segment reporting relating to certain of Alphabet's AI activities. DeepMind, previously reported within Other Bets, will be reported as part of Alphabet's corporate costs, reflecting its increasing collaboration with Google Services, Google Cloud, and Other Bets. Prior periods will be recast to conform to the revised presentation.

Our operating segments are not evaluated using asset information.

The following table presents information about our segments (in millions):

	Year Ended December 31,		
	2020	2021	2022
Revenues:			
Google Services	\$ 168,635	\$ 237,529	\$ 253,528
Google Cloud	13,059	19,206	26,280
Other Bets	657	753	1,068
Hedging gains (losses)	176	149	1,960
Total revenues	\$ 182,527	\$ 257,637	\$ 282,836
Operating income (loss):			
Google Services	\$ 54,606	\$ 91,855	\$ 86,572
Google Cloud	(5,607)	(3,099)	(2,968)
Other Bets	(4,476)	(5,281)	(6,083)
Corporate costs, unallocated	(3,299)	(4,761)	(2,679)
Total income from operations	\$ 41,224	\$ 78,714	\$ 74,842

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,	
	2021	2022
Long-lived assets:		
United States	\$ 80,207	\$ 93,565
International	30,351	33,484
Total long-lived assets	\$ 110,558	\$ 127,049

Note 16. Subsequent Event

In January 2023, we announced a reduction of our workforce of approximately 12,000 roles. We expect to incur employee severance and related charges of \$1.9 billion to \$2.3 billion, the majority of which will be recognized in the first quarter of 2023.

In addition, we are taking actions to optimize our global office space. As a result we expect to incur exit costs relating to office space reductions of approximately \$0.5 billion in the first quarter of 2023. We may incur additional charges in the future as we further evaluate our real estate needs.

— 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, 2022, 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

There have been no changes in our internal control over financial reporting that occurred during the quarter ended December 31, 2022 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

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, 2022. 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, 2022 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

As previously disclosed, Google LLC, a subsidiary of Alphabet, filed notifications with the Russian Federal Security Service as required pursuant to Russian encryption product import controls for the purpose of enabling the import of certain software in Russia. The information provided pursuant to Section 13(r) of the Exchange Act in Part II, Item 5 of our Quarterly Report on Form 10-Q for the quarter ended September 30, 2022 is incorporated herein by reference.

— 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 2023 Annual Meeting of Stockholders to be filed with the SEC within 120 days of the fiscal year ended December 31, 2022 (2023 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 2023 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 2023 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 2023 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 2023 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 2023 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
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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, 2020, 2021, and 2022 (in millions):

	Balance at Beginning of Year	Additions	Usage	Balance at End of Year
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
Year ended December 31, 2022	\$ 1,389	\$ 2,125	\$ (2,301)	\$ 1,213

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	Current Report on Form 8-K (File No. 001-37580)	June 3, 2022
3.02	Amended and Restated Bylaws of the Registrant, dated October 19, 2022	Current Report on Form 8-K (File No. 001-37580)	October 25, 2022
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	Annual Report on Form 10-K (File No. 001-37580)	February 2, 2022
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

Exhibit Number	Description	Incorporated by reference herein	
		Form	Date
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
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	◆ Letter Agreement dated July 11, 2022, between R. Martin Chávez and Alphabet Inc.	Current Report on Form 8-K (File No. 001-37580)	July 14, 2022
10.03	◆ 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
10.04	◆ 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
10.05	◆ Alphabet Inc. Deferred Compensation Plan	Current Report on Form 8-K (File No. 001-37580)	October 2, 2015
10.06	◆ Google Inc. 2004 Stock Plan, as amended	Current Report on Form 8-K (File No. 000-50726)	June 7, 2011
10.06.1	◆ 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
10.07	◆ Alphabet Inc. Amended and Restated 2012 Stock Plan	Current Report on Form 8-K (File No. 001-37580)	June 5, 2020
10.07.1	◆ 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
10.08	◆ Alphabet Inc. Amended and Restated 2021 Stock Plan	Current Report on Form 8-K (file No. 001-37580)	June 3, 2022
10.08.1	◆ Alphabet Inc. Amended and Restated 2021 Stock Plan - Form of Alphabet Restricted Stock Unit Agreement	Quarterly Report on Form 10-Q (file No. 001-37580)	July 28, 2021
10.08.2	◆ Alphabet Inc. Amended and Restated 2021 Stock Plan - Form of Alphabet 2022 Non-CEO Performance Stock Unit Agreement	Annual Report on Form 10-K (File No. 001-37580)	February 4, 2020
10.08.3	◆ * Alphabet Inc. Amended and Restated 2021 Stock Plan - Form of Alphabet 2022 CEO Performance Stock Unit Agreement		
10.09	◆ * Alphabet Inc. Company Bonus Plan, as amended		
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		
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		

Exhibit Number	Description	Incorporated by reference herein	
		Form	Date
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 2, 2023

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	Chief Executive Officer and Director (Principal Executive Officer)	February 2, 2023
<u>/S/ RUTH M. PORAT</u> Ruth M. Porat	Senior Vice President and Chief Financial Officer (Principal Financial Officer)	February 2, 2023
<u>/S/ AMIE THUENER O'TOOLE</u> Amie Thuener O'Toole	Vice President and Chief Accounting Officer (Principal Accounting Officer)	February 2, 2023
<u>/S/ FRANCES H. ARNOLD</u> Frances H. Arnold	Director	February 2, 2023
<u>/S/ SERGEY BRIN</u> Sergey Brin	Co-Founder and Director	February 2, 2023
<u>/S/ R. MARTIN CHAVEZ</u> R. Martin Chávez	Director	February 2, 2023
<u>/S/ L. JOHN DOERR</u> L. John Doerr	Director	February 2, 2023
<u>/S/ ROGER W. FERGUSON JR.</u> Roger W. Ferguson Jr.	Director	February 2, 2023
<u>/S/ JOHN L. HENNESSY</u> John L. Hennessy	Director, Chair	February 2, 2023
<u>/S/ ANN MATHER</u> Ann Mather	Director	February 2, 2023
<u>/S/ LARRY PAGE</u> Larry Page	Co-Founder and Director	February 2, 2023
<u>/S/ K. RAM SHRIRAM</u> K. Ram Shriram	Director	February 2, 2023
<u>/S/ ROBIN L. WASHINGTON</u> Robin L. Washington	Director	February 2, 2023

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Directors and executive officers as of January 2023

Directors

Larry Page
Co-Founder

Sergey Brin
Co-Founder

Sundar Pichai
Chief Executive Officer
Alphabet and Google

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

R. Martin “Marty” Chávez
Partner and Vice Chairman
Sixth Street Partners

L. John Doerr
General Partner and Chair
Kleiner Perkins

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

Ann Mather
Former Executive Vice President and
Chief Financial Officer
Pixar

K. Ram Shriram
Managing Partner
Sherpalo Ventures

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

Executive officers

Sundar Pichai
Chief Executive Officer
Alphabet and Google

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

Prabhakar Raghavan
Senior Vice President
Knowledge and Information
Google

Philipp Schindler
Senior Vice President
Chief Business Officer
Google

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

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 43006
Providence, RI 02940-3006

Courier Services:
Computershare Investor Services
150 Royall Street, Suite 101
Canton, MA 02021

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

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