No. 24-34

In the United States Court of Appeals for the Ninth Circuit

SAMANTHA ALARIO, *et al.*,
PLAINTIFFS-APPELLEES

and

TIKTOK INC.,
CONSOLIDATED PLAINTIFF-APPELLEES

v.

AUSTIN KNUDSEN, *in his official capacity as Attorney General of the State of Montana*,
DEFENDANT-APPELLANT

ON APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF MONTANA (9:23-CV-61) (THE HONORABLE DONALD W. MOLLOY)

BRIEF OF AMICUS CURIAE INTERNET SOCIETY IN SUPPORT OF AFFIRMANCE

AMY MASON SAHARIA
D. SHAYON GHOSH
WILLIAMS & CONNOLLY LLP
680 Maine Avenue SW
Washington, DC 20024
(202) 434-5000
asaharia@wc.com

CORPORATE DISCLOSURE STATEMENT

Pursuant to Rule 26.1 of the Federal Rules of Appellate Procedure, amicus Internet Society states that it does not have a parent corporation, and no publicly held corporation owns 10% or more of its stock.

/s/ Amy Mason Saharia
AMY MASON SAHARIA
WILLIAMS & CONNOLLY LLP
680 MAINE AVENUE, S.W.
WASHINGTON, DC 20024
(202) 434-5000
asaharia@wc.com

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STATEMENT OF INTEREST[1]

Founded in 1992, the Internet Society is a U.S. non-profit organization headquartered in Reston, Virginia and Geneva, Switzerland for the worldwide coordination of, and collaboration on, Internet issues, standards, and applications. As a global non-governmental organization, the Internet Society believes that the Internet should be for everyone. It supports and promotes the development of the Internet as a global technical infrastructure, a resource to enrich people's lives, and a force for good in society, with an overarching goal that the Internet be open, globally connected, secure, and trustworthy. The Internet Society supports communities that seek to connect to the Internet. It advances the development and application of Internet infrastructure, technologies, and open standards. The Internet Society also advocates for policies that protect the Internet and allow it to flourish for all. The Internet Society's staff is comprised of technical experts in internetworking, cybersecurity, and network operations, among other fields, as well as policy experts in a broad range of Internet-related areas.

The Internet Society developed the "Internet Impact Assessment Toolkit" as an analytical framework to evaluate how policy proposals, legal

[1] Pursuant to Federal Rule of Appellate Procedure 29(a)(4)(E), amicus certifies that no person or entity, other than amicus curiae, its members, or its counsel, made a monetary contribution to the preparation or submission of this brief or authored this brief in whole or in part. The parties have consented to the filing of this brief.

decisions, market or geo-political developments, and technology might impact the Internet. The framework's key concepts derive from two foundational Internet Society white papers. *The Internet Way of Networking: Defining the Critical Properties of the Internet* describes the foundation the Internet needs in order to exist and work for everyone (including, for example, an "Open Architecture of Interoperable and Reusable Building Blocks").[2] *Enablers of an Open, Globally Connected, Secure and Trustworthy Internet* describes what the Internet needs, in addition to its foundation, to get closer to the aspirational state of the Internet widely recognized by countries and institutions across the world.[3] This analytical methodology, as well as the Internet Society's extensive knowledge of how content is developed and flows across the Internet, inform the arguments the Internet Society sets out below.

The Internet must be open and equally accessible to flourish. When governments ban websites or platforms, especially those that facilitate individual participation on the Internet, they undermine these core requirements, harming users and the Internet as a whole. Geographic bans like the Montana law,

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[2] Internet Society, *The Internet Way of Networking: Defining the Critical Properties of the Internet* (Sept. 2020), https://www.internetsociety.org/wp-content/uploads/2020/09/IWN-IIAT-Defining-the-critical-properties-of-the-Internet.pdf ("Internet Way of Networking").

[3] Internet Society, *Enablers of an Open, Globally Connected, Secure and Trustworthy Internet* (Nov. 8, 2021), https://www.internetsociety.org/wp-content/uploads/2021/11/Enablers-of-OGST-EN.pdf ("Enablers").

moreover, threaten to undermine users' security and privacy, which those laws purport to protect. Further, permitting geographic bans like Montana's law may encourage other States—and other nations—to follow suit, creating a patchwork of different, and sometimes conflicting, laws that are very challenging for technology platforms and often produce confusion and uncertainty for users. The Internet Society submits this brief to help the Court understand the pernicious impact and technological risks of Montana's law.

INTRODUCTION AND SUMMARY OF ARGUMENT

The Internet was founded upon principles of openness and accessibility, two instrumental qualities that shaped it into the invaluable resource it is today. The Internet is a network of networks, each acting independently, but connecting collaboratively through common protocols. Similarly, the vast variety of content and resources available on the Internet depends on a global diversity of organizations, companies, and individuals making such content and resources available. The unrestricted ability to access the Internet has been critical to its growth and evolution because the Internet depends on the contributions of users to thrive. As more users participate, the pool of shared resources becomes richer and more diverse, with users adding and iterating to generate new creations. Excluding a large swath of users from this collaborative process diminishes the Internet's creative capacity as a whole and unduly restricts users' ability to connect, create, and express themselves.

Montanans will suffer this fate if the State's TikTok ban is implemented—they will be prevented from finding community on the platform, offering creative content on the platform, and, for some, profiting from that content. The ban thus would harm the citizens of Montana and the State as a whole.

Because of the technical impracticalities of a geographic ban of TikTok, Montanans would incur this harm without gaining the purported protections the law claims to provide. Enforcing the law would require TikTok and app stores to engage in some form of location-based geoblocking. Geoblocking based on Internet Protocol (IP) addresses is inaccurate and easily circumvented, and would create opportunities for malicious online actors to prey on Montanans attempting to connect to TikTok despite the ban. Location-based geoblocking that uses smartphone Global Positioning Satellite (GPS) receivers and other sensors, although more accurate, is much more intrusive and would require TikTok and app stores to track ongoing, fine-grained location data for *every user in the United States*. The law would likely leave users worse off creatively and economically, while weakening users' privacy or security, especially if the affected companies are forced to deploy fine-grained tracking technologies to avoid the law's draconian penalties. The harm to the privacy of Montanans, and as detailed below, the likely harm to *all* Internet users in the United States, would be substantial.

ARGUMENT

I. The Montana Law Undermines Foundational Aspects and Benefits of the Internet

The challenged Montana law does not directly and materially advance important state interests.[4] To the contrary, the law undermines foundational aspects of the Internet and will harm Montanans by preventing them from accessing the full Internet, and from engaging with the more than 150 million Americans—and 1 billion users around the world—who use TikTok. Alario Br. 3.

A. Geographic Bans Undermine Foundational Principles of the Internet

The Internet is "a global technical infrastructure, a resource to enrich people's lives, and a force for good in society." Internet Society, *Our Mission*, https://www.internetsociety.org/mission/. It allows users to draw from common resources and utilize them in new ways, offering unlimited opportunities—from sharing information, to creating new e-commerce businesses, to socially connecting with others.

Unlike other media for transmitting content such as newspapers, radio, and television, the Internet is composed of multiple independent systems, each

[4] *See Turner Broad. Sys. Inc. v. FCC,* 512 U.S. 622, 664 (2004) (holding that when the government regulates speech, "[i]t must demonstrate that the recited harms are real, not merely conjectural, and that the regulation will in fact alleviate these harms in a direct and material way").

operating in its own way. These systems are not centrally controlled or managed. Rather, they use common technical protocols that allow them to communicate with each other. The participants in this vast network of networks include people from all over the world who use the Internet for many and varied purposes. Participants are both content consumers and content creators, and thus the Internet enables communication from person to person, from a person to a community, and from one community to another. The Internet also enables participants to choose what content they want to receive, from whom, how they want to receive it (*e.g.*, via video, audio or text), and when.

To thrive, the Internet must be open, accessible, and globally connected. *See Internet Way of Networking*, *supra*, at 4. An open and accessible Internet requires minimal restrictions to facilitate as much participation as possible. *See id.* "As more and more participants connect, the value of the Internet increases for everyone." *Id.* The Internet is a globally connected network that enables users to connect with one another without any geographical barriers. This is not a coincidence or a political decision but rather an integral part of the Internet's technical design. While every network node exists in a physical location and a specific jurisdiction, the Internet's routing design does not consider physical location an essential aspect (unlike the old phone networks, for example). This has many technical benefits, such as allowing devices to move

around, enabling mobile networks, and increasing the technical resilience of any network connected to the Internet.

This global connectivity enables individuals and institutions from diverse backgrounds to access the Internet's vast resources equally and interact with each other in ways never previously possible. *See Enablers, supra*, at 3. This free collaboration has fundamentally changed the way we learn, communicate, and spend our waking hours, and allowed people across the world to interact with people and content globally, without geographic limits. The Internet has introduced billions of people to new ideas, spawned new art forms, and enabled endless iterations upon old art forms. All of this has been possible only because the Internet was designed to be open to all, enabling "users across borders to collectively shape its evolution." *Id.*

Geographic bans violate these fundamental principles. If Montana's law is enforced, anyone living in or visiting the State would no longer have access to a major commercial technology platform that millions of people across the globe use every day to inform, entertain, conduct business, and communicate with each other. Montanans would be uniquely excluded from a huge source of diverse online discourse and content solely due to their geographic location. They would be unable to interact with their peers on TikTok, both inside and outside of the State. And their absence would be felt beyond the State's borders, as the ban would prevent them from contributing content to TikTok that

other individuals outside Montana would consume. This would stifle the free exchange of ideas that has made the Internet so powerful.

Montana's ban follows in the footsteps of similar actions by foreign nations that disrupt Internet connectivity or block access to specific Internet services. Such actions severely limit users' rights to information and self-expression and produce harmful economic consequences. The Internet Society monitors and tracks such government actions. *See, e.g.*, Robbie Mitchell, *Tracking Internet Shutdowns in 2023*, Internet Society Pulse (Jan. 11, 2024), https://pulse.internetsociety.org/blog/tracking-internet-shutdowns-in-2023-2. For example, in 2021, after Twitter deleted a tweet by then-president Muhammadu Buhari for breaching its terms of service, the Nigerian government banned Twitter for seven months. Verengai Mabika & Emmanuel C. Ogu, *Internet Impact Brief: Nigeria's Protection from Internet Falsehood and Manipulation Bill 2019*, Internet Society (Feb. 21, 2022), https://www.internetsociety.org/resources/2022/internet-impact-brief-nigerias-protection-from-internet-falsehood-and-manipulation-bill-2019/. The ban restricted how Nigerian residents could use and contribute to the Internet, which both constrained their free expression and prevented millions of small and medium-sized businesses from using the platform to reach their customers. *Id.*

Similarly, Russia banned the mobile messaging application Telegram between 2018 and 2020 because it refused to give the government access to

encrypted messages on its app. Ingrid Lunden, *Russia's Telegram ban that knocked out 15M Google, Amazon IP addresses had a precedent in Zello*, TechCrunch (Apr. 18, 2018, 1:27 a.m.), https://techcrunch.com/2018/04/17/russias-telegram-ban-that-knocked-out-15m-google-amazon-ip-addresses-had-a-precedent-in-zello/. The government implemented its ban by blocking IP addresses associated with Telegram.[5] To circumvent the government's IP-based blocking, Telegram moved its servers and repeatedly changed its IP address, but the Russian government responded by blocking a range of over 15 million IP addresses. *See* Lunden, *supra*. A wide variety of websites completely unrelated to Telegram were blocked as a result, affecting not just the 14 million Russians who used Telegram but all Internet users in Russia. *See id.*

Similarly, roughly a week after Russia invaded Ukraine in 2022, the Russian government blocked Facebook and Twitter because both platforms announced they would reduce the visibility of Russian state-affiliated media websites for spreading misinformation. Morgan Meaker, *Russia Blocks Facebook and Twitter in a Propaganda Standoff*, Wired (Mar. 4, 2022), https://www.wired.com/story/russia-ukraine-social-media/. Russia's blocking independent sources of online coverage of the war has starved Russians of

[5] An IP address is a numerical identifier assigned to an Internet-connected device—a web server, computer, cell phone, or anything else—that allows the device to be found by and exchange information with other connected devices on the Internet. *See infra* Part II.A.

reliable access to information. The bans in Nigeria and Russia highlight the damage that blocking laws can cause.

B. Geographic Bans Diminish the Internet's Creative Capacity

The Internet's openness and accessibility have enabled it to evolve into a primary means of creative self-expression and a critical locus of economic activity. These features allow users to collaborate with people anywhere in the world and build on each other's ideas to create new forms of expression that were previously unimaginable.[6]

Creative activity is particularly prolific on TikTok. For example, TikTok creator Katriel Nopoulous was born without a lower jaw and gained a following on the platform by educating others on her daily challenges.[7] Because TikTok makes it simple for creators to use a computer-generated voice to read text out loud, Nopoulous was able to reach a new audience since she previously depended on American Sign Language to communicate. Elsewhere on the app, devoted fans of niche novels can find each other on TikTok's book community, BookTok, and rewrite the histories of their favorite characters. And

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[6] Internet Society, Creativity and Expression through the Internet, https://www.internetsociety.org/our-net/experiences-of-internet/creativity-and-expression/.

[7] Ben Adler, *People with disabilities have built a community on TikTok. They fear its loss if the app is banned*, Yahoo! News (May 4, 2023), https://news.yahoo.com/people-with-disabilities-have-built-a-community-on-tiktok-they-fear-its-loss-if-the-app-is-banned-110036438.html.

artists can edit the latest viral video clip to surrealist heights, while others "duet" it on TikTok with their own video commentary, leading to endless iterations. This unbridled creativity has birthed different art forms, invented new jobs, and changed our culture.

State-specific bans like the Montana law and other geographic bans will sap the Internet of its vast creative potential. The law prevents users in Montana from creating or consuming content on TikTok, and much of that content is made exclusively for that platform. Residents of Montana will be unable to access the same information that everyone else in the country can see, and they will be excluded from the near-infinite diversity of communities that have flourished on TikTok.

For many users, and in particular younger ones, TikTok is their primary means of interacting with the Internet. A recent study showed that 74% of Generation Z uses TikTok to search for information online, with a majority of survey respondents preferring TikTok over Google for their search needs. Jeremy Goldman, *TikTok gains favor among Gen Z over Google for searches*, EMarketer (Jan. 17, 2024), https://www.emarketer.com/content/gen-z-prefers-tiktok-google-searches. Moreover, the Pew Research Center reported that 32% of U.S. adults aged eighteen to twenty-nine regularly get news from TikTok. Katerina Eva Matsa, *More Americans are getting news on TikTok, bucking the trend seen on most other social media sites*, Pew Rsch. Ctr. (Nov.

15, 2023), https://www.pewresearch.org/short-read/2023/11/15/more-americans-are-getting-news-on-tiktok-bucking-the-trend-seen-on-most-other-social-media-sites/. If TikTok were unavailable in Montana, younger users would lose not only access to an enormously popular source of information and entertainment, but also a primary means by which they interact with their peers outside of Montana.

Even outside the TikTok platform, the ban would impact the vast array of non-TikTok websites that embed TikTok content. Many websites—from blogs to news providers—insert code on their webpages that direct a user's web browser to retrieve content from a different server. *See generally Hunley v. Instagram, LLC*, 73 F.4th 1060, 1063-64 (9th Cir. 2023). For instance, a blog post about trying a popular recipe might embed a TikTok video with step-by-step instructions,[8] as might a newspaper article about TikTok recipe videos.[9] A user can watch a video without leaving the original site or navigating to TikTok's site, because while the video is hosted by TikTok's servers, it is embedded into the blog post or article. The ability for a content creator to embed

[8] Meleyna Nomura, *I finally tried TikTok's viral baked spaghetti and now I totally understand the hype*, The Kitchn (Feb. 20, 2023), https://www.thekitchn.com/tik-tok-spaghetti-recipe-review-23507280.

[9] Aaron Hutcherson, *Why we can't stop watching terrible TikTok cooking videos*, Wash. Post (Oct. 12, 2023, 10:00 a.m.), https://www.washingtonpost.com/food/2023/10/12/bad-tiktok-cooking-videos/.

code or instructions for viewers' web browsers to access images, videos, services, etc., from somewhere else online exemplifies the Internet's generative and modular capacity. Embedding enables the creation of content that is more accessible to more people.

Embedding of content—whether from TikTok or elsewhere on the Internet—is extremely common across the Internet.[10] In Montana, these websites would appear without the embedded content, confusing users and making the website less informative. And to implement this block, as discussed further below, TikTok's servers would have to determine the location of every user who navigates to a website that embeds TikTok content, using either imprecise IP-based means or other more intrusive geolocation-based techniques. *See infra* Part II.

The repercussions of this ban will reverberate beyond Montana's borders. The whole Internet suffers whenever large swaths of people are excluded from the conversation. The rest of the world will be deprived of content from Montana's creators—including, but not limited to, appellees. For instance, one named appellee in this case, Carly Ann Goddard, averred that she uses TikTok to share her experience as a mother and rancher's wife in rural

[10] Barry Pollar, *Third Parties*, Web Almanac by HTTP Archive (Nov. 17, 2021), https://almanac.httparchive.org/en/2021/third-parties#prevalence (finding that around 95% of all websites embed third-party content).

Montana, chronicling a way of life unfamiliar to her over 100,000 followers. E.R. 59-61.[11]

The Internet is not only a platform for conversation and social engagement—it is also a powerful platform for entrepreneurs and small businesses to make money and, in some cases, earn a living. This is especially true in rural and other remote communities. The Montana law, if implemented, would cause real economic harm to Montana and its residents. Many content creators, including Montanans, rely on TikTok as a significant source of income. For instance, Ms. Goddard explained that she earns between $2,000 and $4,000 a month on sponsorship deals for her TikTok videos, but was forced to pause her plans to expand her family due to the threat of Montana's law. E.R. 60-61; Bonos, *supra*. ZipRecruiter analyzed its database of millions of job postings and found that the average salary listed on job postings for a "Tiktok Content Creator" is $116,615 a year in the U.S., and $110,329 for such job listings based in Montana.[12] Montanans also could not buy or sell products on TikTok's robust ecommerce platform. Three in four surveyed TikTok users reported they were likely to buy something while using the platform, and 83% said that

[11] *See also* Lisa Bonos, *Montana banned TikTok. Now these Montanans are fighting back*, Wash. Post (June 8, 2023, 1:21 p.m.), https://www.washingtonpost.com/technology/2023/06/03/tiktok-ban-montana-influencers/.

[12] *What Is the Average Tiktok Content Creator Salary by State*, ZipRecruiter, https://www.ziprecruiter.com/Salaries/Tiktok-Content-Creator-Salary.

TikTok plays a role in their purchase decisions. TikTok Shop, https://shop.tiktok.com/business/us.

Then there are the small businesses that would no longer be able to advertise on TikTok despite the platform's large and influential reach. A Montana business owner explained that marketing through TikTok allowed her to reach half a million people through a viral video, which "doubled" one arm of her business "literally overnight." Kristin Merkel, *Montana rancher says TikTok ban would harm business*, KTVQ News (Mar. 15, 2023, 10:55 a.m.), https://www.ktvq.com/news/montana-ag-network/montana-rancher-says-tiktok-ban-would-harm-business (quoting the business owner as stating that a TikTok ban would "take [her business] out at the knees" and put "Montanans at a unique disadvantage compared to other small businesses in other states"). These financial consequences are not hypothetical. *See* Internet Society Netloss Calculator, https://pulse.internetsociety.org/en/netloss/.[13]

Beyond the harm to individual Montanans, some residents may leave the State due to their inability to pursue their livelihood in Montana, and potential

[13] The Internet Society Pulse NetLoss Calculator uses an economic framework to estimate the impact of Internet shutdowns on a range of economic, social, and other outcomes. It uses econometric tools to provide a rigorous and precise estimate of the economic impact of a given shutdown or service block. For a discussion of the methodology of the site, see *Internet Society Pulse NetLoss Calculator*, Internet Society (June 2023), https://pulse.internetsociety.org/wp-content/uploads/2023/06/Methodology_Internet-Society-Pulse-NetLoss-Calculator_June-2023.pdf.

new residents may avoid Montana altogether in light of the TikTok ban. While Montana's population increased by 5.7% between 2018 and 2022, the challenged law could reverse or dampen that trend, as prospective residents move to other States that do not block this popular social media platform. *Our Changing Population: Montana*, USAFacts (July 2022), https://usafacts.org/data/topics/people-society/population-and-demographics/our-changing-population/state/montana/. And although Montana's tourism industry has boomed in recent years, with visitors to Montana spending $5.82 billion in 2022 alone,[14] at least some potential tourists are likely to travel instead to States where their families can scroll through TikTok or post about their vacation on the platform.

II. The Montana Law Is Technically Unworkable and Counterproductive.

The Montana law also does not advance the State's asserted user security interests because it is both technically unworkable and ultimately harmful—not helpful—to users' privacy and security. Given the borderless architecture of the Internet, *see supra* Part I.A, there is no effective means to disable one platform on the Internet within a single State while still protecting users' security and privacy. Broadly speaking, to block Montana-based users

[14] Melissa Weddell, Inst. for Tourism & Recreation Rsch., *The Montana Travel Industry - 2022 Summary* (2023), https://scholarworks.umt.edu/cgi/viewcontent.cgi?article=1445&context=itrr_pubs.

from TikTok, TikTok and app stores have two options: IP-based and location-based geoblocking. The former is imprecise and easily circumvented. And the latter would expose Montanans and others to significant invasions of privacy.

A. IP-Based Geoblocking Is Imprecise and Can Be Easily Circumvented

IP-based geoblocking uses a rough approximation of a user's location based on her IP address, which as noted above is a string of numbers used to route information to a user's device. Aaron Mackey et al., *Unreliable Informants: IP Addresses, Digital Tips and Police Raids*, Elec. Frontier Found. 5 (Sept. 2016), https://www.eff.org/files/2016/09/22/2016.09.20_final_formatted_ip_address_white_paper_0.pdf; *see supra* p. 9, n.5. IP addresses do not reveal a device's exact location, and the rough approximations they can provide are often inaccurate and subject to circumvention.

IP addresses were created to allow a device to send and receive data through the Internet. Mackey et al., *supra*, at 5. They were not intended to provide geolocation information. *Id.* Indeed, the fact that IP addresses are not generally tied to any particular physical location is an intentional and important technical design feature. With an addressing scheme wholly disconnected from geography, the Internet has been able to grow seamlessly, operate with a very high level of global reliability, and easily repurpose IP addresses when they are no longer needed for an earlier use.

Generally, Internet service providers (ISPs), such as cable and telephone companies, are assigned blocks of IP addresses by a global system of allocation, and they in turn can assign blocks of IP addresses in whichever manner delivers Internet traffic most efficiently. *Id.* Sometimes that means that nearby locations have similar IP addresses, but not always. *Id.* For instance, if an ISP has a fiber-optic link between two distant cities, A and B, those cities may be assigned similar IP addresses. *Id.* But a third city geographically closer to city A that does not have the same connection would likely be assigned a completely different block of IP addresses. *Id.* Moreover, ISPs often assign dynamic IP addresses to users who access the Internet through a home network or a personal device, meaning that these IP addresses will change automatically from time to time, with customers swapping IP addresses. *See, e.g.*, *id.* at 6; *see also* Declaration of Karen Sprenger, Dist. Ct. Dkt. 16, ¶ 10. Sometimes, when a user simply reboots her router, the ISP will assign the device a new IP address. As a result, there is no way to definitively relate a device's IP address to its physical location. Mackey et al., *supra*, at 5-6.

Some third-party geolocation companies have created their own commercial databases linking IP addresses to physical locations. *See, e.g,* MaxMind GeoIP Databases, MaxMind, https://www.maxmind.com/en/geoip-databases; *see also* Sprenger Decl., Dist. Ct. Dkt. 16, ¶¶ 12-13. These companies

combine IP addresses with other inputs, including information provided by ISPs, to estimate a location. Still, the accuracy of these databases is limited because they depend on ISPs to share frequent updates with accurate information, and because, as noted, IP addresses were not designed to provide geolocation data.

Some third-party IP geolocation companies claim to correctly estimate a desktop device's location (plus or minus 50 kilometers, or about 31 miles) about 80% of the time.[15] But these accuracy rates are lower for areas like Montana, which are less densely populated and have less Internet traffic. Sprenger Decl., Dist. Ct. Dkt. 16, ¶ 12 (citing *GeoIP2 City Accuracy*, and Dan Komosny et al., *Location Accuracy of Commercial IP Address Geolocation Databases*, 46 J. Info. Tech. 333, 340 (2017)). IP-based geolocation would be especially challenging for individuals living near the Montana border. For instance, a resident of Sheridan, Wyoming could be mistakenly blocked from accessing TikTok simply because her home is close to Montana's border, putting her within the margin of error for even the more accurate IP geolocation technology. Similarly, some residents of Fairview, Montana may be able to access TikTok while others cannot, since the town sits on the border between Montana and North Dakota.

[15] *GeoIP2 City Accuracy*, MaxMind, https://www.maxmind.com/en/geoip2-city-accuracy-comparison?country=US&resolution=50&cellular=excluding ("GeoIP2 City Accuracy").

IP address geolocation for mobile devices is even more challenging—and these, of course, are the devices on which users usually access TikTok. Cell phone providers assign IP addresses as needed across their entire national networks, meaning that the IP addresses are not associated with a specific geographic area.[16] And the IP address associated with a mobile device can change as often as the device changes location. Therefore, accuracy rates for mobile IP address geolocation are even lower than for desktop computers, with one study finding that IP geolocation companies can correctly estimate the location of mobile devices (plus or minus 50 kilometers) only 15 to 28% of the time. *See* Komosny et al., *supra*, at 336-37. In short, using IP-based geoblocking to enforce a TikTok ban would be both under- and overinclusive: some users in Montana could still access the platform, while others outside of Montana may be erroneously blocked.

Not only is IP-based geoblocking imprecise, it is also easily circumvented through the use of virtual private networks (VPNs). A VPN is a tool that reroutes Internet traffic between a device (such as a computer or smartphone) and a server (like Web servers or those used by TikTok), in part by routing it through a VPN server. Joseph Jerome, *Techsplanations: Part*

[16] Triukose et al., *Geolocating IP Addresses in Cellular Data Networks*, *in* 7192 *Lecture Notes in Computer Science*, *International Conference on Passive and Active Network Measurement* 158, 164-65 (N. Taft & F. Ricciato eds., 2012).

5, Virtual Private Networks, Ctr. for Democracy & Tech. (Oct. 16, 2018), https://cdt.org/insights/techsplanations-part-5-virtual-private-networks/. VPNs are widely recognized as important security tools that protect the confidentiality of data from third-party observation, particularly on poorly secured networks such as public WiFi networks at airports or coffee shops. *See id.* Because the VPN acts as a tunnel for the user's Internet traffic, the user's actual IP address is disguised—when the user accesses any server through the VPN, the server will only see the IP address associated with the VPN server (which is very commonly located in another state or even country from the user). *Id.* Enterprise VPNs have long been used by employers to provide remote access to computer networks for teleworking. *See id.*

VPNs will be attractive mechanisms for Montanans to attempt to continue accessing TikTok. A user with an IP address in Montana will be able to disguise herself with an IP address from another State to circumvent the ban. When Montana's age verification law for adult content came into effect at the beginning of 2024, VPN demand peaked at 482 percent over normal demand. Simon Migliano, *VPN Demand Surges Around the World*, TOP10VPN (Apr. 30, 2024), https://www.top10vpn.com/research/vpn-demand-statistics/. When Nigeria blocked Twitter, VPN usage increased by more than 1400 percent. *See id.* When Russia blocked Telegram, enough users employed VPNs to access the app that the government subsequently blocked a long list of VPN

services. Dani Deahl, *Russia takes further steps to restrict access to Telegram*, The Verge (May 3, 2018, 11:37 a.m.), https://www.theverge.com/2018/5/3/17314896/telegram-russia-restriction-app.

While VPNs are easily accessible and fairly simple for users to install, they are also vectors for risk and can introduce security weaknesses onto users' devices. While established and known VPN providers are generally trustworthy and responsible, VPN services can be offered with a very low investment, and not all advertised VPN services are secure or legitimate. As Montanans look for ways to circumvent a TikTok ban, malicious actors could easily market VPN services to target this group. It can be difficult for the user—especially those not familiar with VPNs—to discern between trustworthy VPN providers and bad actors. Younger or less technically savvy users may simply install whichever VPN is directly marketed to them. And once a user unknowingly installs malicious VPN software onto her device, it is easy to introduce malware and spyware onto the device as well. Thus, using IP-based geoblocking to enforce Montana's ban would very likely expose users to heightened security and privacy risks.

B. Location-Based Geoblocking Impinges on Users' Privacy Rights

Alternatively, TikTok and app stores could block users based on more fine-grained location data obtained directly from their devices. Modern devices can typically identify their location using a combination of different

technologies, which can include GPS (global positioning system), information from nearby WiFi access points and cell towers, sensors on the devices (such as compasses and accelerometers), and IP addresses.[17] GPS determines location by triangulating GPS satellite signals. *Hearing on Protecting Mobile Privacy, supra*, n.9. GPS can at times accurately identify a user's location to within a few meters, but it is less accurate indoors where it is more difficult for satellite signals to penetrate. To improve accuracy, especially indoors, devices can also analyze which WiFi networks they can detect, and cross-reference that information against a database of WiFi access points and their physical locations. *Id.* For example, a device that is near an airport WiFi network is likely located in the airport.

These techniques achieve greater accuracy, but also greatly increase the intrusiveness of the locating (or tracking).[18] Location data is often considered

[17] *Hearing on Protecting Mobile Privacy: Your Smartphones, Tablets, Cell Phones, and Your Privacy Before the Subcomm. on Privacy, Technology and the Law of the Comm. on the Judiciary*, 112th Cong., Testimony of Ashkan Soltani (2011), https://www.judiciary.senate.gov/imo/media/doc/CHRG-112shrg86775.pdf.

[18] Precise location services also can significantly drain the battery life of a mobile device (which is a reason why app makers usually do not activate such services unless the app truly needs precise location). *See* Vesna Mihajlovic, *Do GPS Tracking Apps Drain Mobile Battery? Here's What You Need to Know*, Timeroo.com (Apr. 18, 2024, 2:48 p.m.), https://timeero.com/post/do-gps-tracking-apps-drain-mobile-battery-heres-what-you-need-to-know ("Under a good signal strength, GPS apps will shorten the battery's life less - by

"sensitive data" under privacy and data protection laws because it reveals information about the physical location of an online user and can be used to track users across time and space. *See, e.g.*, *United States v. Jones*, 565 U.S. 400, 415 (2012) (Sotomayor, J., concurring) ("GPS monitoring generates a precise, comprehensive record of a person's public movements that reflects a wealth of detail about her familial, political, professional, religious, and sexual associations."). To block Montanans from TikTok effectively, TikTok and app stores would have to determine users' location whenever they tried to access TikTok. By storing those locations over time to protect themselves against sanctions, the companies could develop a detailed and intrusive profile of each user, including the places where they live, work, travel, and study. Ultimately, although an asserted goal of Montana's TikTok ban is to protect Montanans' privacy, the outcome would be to *increase* surveillance and tracking of Montana users' location, harming their privacy.

To make matters worse, for this technology to be effective, TikTok would be forced to determine location data for *all users who may enter Montana*, not just current residents of Montana. While TikTok does not currently

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13% . . . . [I]n an area with weak signal strength, the battery can deplete up to 38%.").

collect location data from U.S. users,[19] it would need to start doing so to comply with Montana's ban.

Google and Apple, which control the mobile app stores for Android and iPhone (the mobile operating systems that comprise over 99% of cell phones in the United States[20]), would similarly have to track this granular location data for all U.S. users to prevent TikTok downloads from the app stores in Montana. Asking TikTok, Google, and Apple to surveil nearly every American with a cell phone, based on the possibility that a user might enter Montana, would be a significant invasion of privacy to say the very least.

Furthermore, while the drafters of the Montana law intended the app store provisions to prevent new users from downloading the app and to stop current users from installing necessary software updates, those provisions present two significant problems. First, it is entirely possible for users to download the app and install updates in a different State before returning to Montana. Second, current users in Montana might simply leave outdated

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[19] *See, e.g.*, Declaration of Blake Chandlee, Dist. Ct. Dkt. 14, ¶ 29; Shou Chew, Written Statement of Testimony, U.S. House Comm. on Energy & Commerce, at 5-6 (Mar. 23, 2023), https://docs.house.gov/meetings/IF/IF00/20230323/115519/HHRG-118-IF00-Wstate-ChewS-20230323.pdf.

[20] Mobile Operating System Market Share United States Of America Mar 2023-Mar 2024, StatCounter, https://gs.statcounter.com/os-market-share/mobile/united-states-of-america.

versions of TikTok on their phones. But outdated versions of the app would also lack the latest security patches, which could further expose users to malicious actors, especially if they are already using untrustworthy VPNs to circumvent the ban. In these additional respects, the Montana law would create new security problems.

* * *

In sum, to attempt to comply with Montana's law, TikTok and the app stores would either employ inaccurate and ineffective IP-based geoblocking, or intrusive privacy-invading location-based geoblocking. The Montana law would make companies liable for ten thousand dollars each time a user accesses TikTok or is offered the ability to access or download the app, plus an additional ten thousand dollars a day thereafter for as long as the violation continues. Given the law's steep penalties, the companies would have strong incentives to sacrifice privacy in favor of accuracy—requiring the exact type of data collection the Montana law purportedly wants to prevent. And the resulting invasion of privacy would impact *all* American users, not just those in Montana.

CONCLUSION

The Court should affirm the decision below.

Respectfully submitted,

/s/ Amy Mason Saharia

AMY MASON SAHARIA
D. SHAYON GHOSH
WILLIAMS & CONNOLLY LLP
680 Maine Avenue SW
Washington, D.C. 20024
(202) 434-5000
asaharia@wc.com

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CERTIFICATE OF COMPLIANCE
WITH TYPEFACE AND WORD-COUNT LIMITATIONS

I, Amy Mason Saharia, counsel for appellant and a member of the Bar of this Court, certify, pursuant to Federal Rule of Appellate Procedure 32(g)(1) and Ninth Circuit Rule 32, that the attached Brief of Amicus Curiae Internet Society, is proportionately spaced, has a typeface of 14 points or more, and contains 5,730 words.

/s/ Amy Mason Saharia

AMY MASON SAHARIA
WILLIAMS & CONNOLLY LLP
680 Maine Avenue SW
Washington, DC 20024
(202) 434-5000
asaharia@wc.com

MAY 6, 2024

CERTIFICATE OF SERVICE

I, Amy Mason Saharia, counsel for appellant and a member of the Bar of this Court, certify, that, on May 6, 2024, a copy of the attached Brief of Amicus Curiae Internet Society was filed with the Clerk through the Court's electronic filing system. I further certify that all parties required to be served have been served.

/s/ Amy Mason Saharia

AMY MASON SAHARIA
WILLIAMS & CONNOLLY LLP
680 Maine Avenue SW
Washington, DC 20024
(202) 434-5000
asaharia@wc.com

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