No. 24-279

In The
Supreme Court of the United States

360 VIRTUAL DRONE SERVICES LLC, ET AL.,
Petitioners,
v.
ANDREW L. RITTER, IN HIS OFFICIAL CAPACITY AS EXECUTIVE DIRECTOR OF THE NORTH CAROLINA BOARD OF EXAMINERS FOR ENGINEERS AND SURVEYORS, ET AL.

ON PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FOURTH CIRCUIT

BRIEF OF DRONEDEPLOY, INC. AND DRONE SERVICE PROVIDERS ALLIANCE (DSPA) AS *AMICI CURIAE* IN SUPPORT OF PETITIONERS

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INTEREST OF *AMICI CURIAE*[1]

Amicus DroneDeploy, Inc. ("DroneDeploy") produces cloud-based software that enables users to create aerial maps and 3D models from drone-captured images. DroneDeploy's software facilitates drone flights from take-off to landing and offers innovative solutions for diverse industries, from construction and mining to farming and utilities. DroneDeploy's technology is also used around the world to assist in conservation efforts, natural-disaster response, and law enforcement.

Amicus Drone Service Providers Alliance ("DSPA") is an industry advocate committed to creating a positive environment for drone operators. DSPA engages in education to improve safety and encourage best practices for drone operators, and advocates for the passage of reasonable and appropriate laws and regulations for the operation of drones across the United States.

Amici submit this brief to better inform the Court of the implications of the Fourth Circuit's decision on the drone industry and to urge this Court to grant the petition for certiorari.

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[1] Pursuant to Supreme Court Rule 37.2, *amici curiae* states that they provided timely notice to all counsel of their intent to file a brief. Pursuant to Supreme Court Rule 37.6, *amici curiae* state that no counsel for any party authored this brief in whole or in part and no entity or person, aside from *amici curiae*, their members, or their counsel, made any monetary contribution intended to fund the preparation or submission of this brief.

INTRODUCTION AND SUMMARY OF ARGUMENT

Drone operators are at the forefront of a burgeoning industry that enables users to view objects and the natural environment in ways that were previously impossible. By flying drones, users can quickly capture images from multiple altitudes and angles. With the aid of software from *amicus* DroneDeploy and others, users can convert those images into provably accurate maps and models.

Drone-enabled data collection has a wide variety of commercial and non-commercial uses. For example, drone technology is invaluable for commercial real estate development, as it allows builders to understand the terrain in which they intend to build, to assess their need for and stock of building materials, and to evaluate progress. In the farming and energy sectors, drones can be used to monitor crops and infrastructure. Non-commercial uses of drone technology include conservation and sustainability, crisis response, and law enforcement.

The Fourth Circuit's decision (and others like it) would allow states to subject increasingly common and beneficial uses of drone technology to burdensome and unnecessary licensing requirements. That outcome would not only stymie the burgeoning drone industry, it would chill speech in contravention of the First Amendment. Accordingly, *amici* urge the Court to grant the petition for certiorari.

ARGUMENT

I. DRONE PHOTOGRAPHY IS AN INNOVATIVE AND REVOLUTIONARY TECHNOLOGY

Drone-enabled data collection leverages technological advances to facilitate safer, more accurate, and more cost-effective ways of making maps and modeling structures and other physical objects. Those technological advances have fueled a vibrant and growing industry focused on using drone technology to improve outcomes for individuals and businesses alike.

A. Background

A drone is an unmanned aircraft typically operated from the ground by a pilot. Drones can be equipped with various sensors, such as visual cameras, infrared sensors (IR), and light detection and ranging (LiDAR) sensors. Visual cameras capture photographic images, while IR sensors gather temperature data and LiDAR sensors measure the distance between the sensor and points on the ground using laser-based technology.

Drone-enabled data collection facilitates the creation of maps and models that could not be made absent the technology. A single image taken from above cannot be used to extract accurate measurements. But by combining multiple, overlapping drone-captured images into one composite image, points that appear in various images can be triangulated and used to make measurements. That process of triangulating points from overlapping images is called photogrammetry; the process of

extracting metadata from overlapping, drone-captured images to create measurable composites is known as "geo-referencing."

Available software, including from *amicus* DroneDeploy, facilitates this work. That software allows users to plan and execute drone-enabled data collection missions by determining a geographic area on a touch-screen and indicating the relevant type of data-capture needed (e.g., creating a topographical map). Once captured, images are automatically associated with geolocation data through integration with leading geolocation services. Using the software, the user then converts the drone-captured images into desired maps or models—typically a two-dimensional aerial orthomosaic ("ortho") map or a photorealistic 3D model. Multiple studies have demonstrated the reliability and accuracy of the maps and models created using DroneDeploy's software. [2]

B. Drone-enabled data collection has advantages over traditional data collection

Compared to the traditional methods of gathering data, drones provide three main advantages: technical superiority, safety, and cost efficiency.

Technology. Drones allow the collection of data that could not be gathered otherwise. They can swiftly

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[2] *See e.g.*, Adam Carp, *Measuring Accuracy of the DJI Mavic 3 Enterprise RTK using DroneDeploy Photogrammetry*, DRONEDEPLOY (last visited Oct. 23, 2024), http://insider.dronedeploy.com/media/measuring-accuracy-of-the-dji-mavic-3-enterprise-rtk-using-dronedeploy-photogrammetry.

capture images of a natural or manmade structure from every angle and altitude, which can then be combined into an ortho map or 3D model. Without drones, data would be collected by manned aircraft or a ground-based team whose measurements could only be approximated. Drones also offer a higher level of data granularity: they can hover closer to the ground or an object and record the time and geographic coordinates of each image that is captured. That additional granularity facilitates better record-keeping and processing.

Safety. Drones allow data to be collected about hazardous environments and hard-to-reach places without endangering human life. Utility poles, radio towers, partially constructed buildings, and other unsafe structures can be inspected far more safely by drones than by humans who must climb and scale those structures to collect measurements. Drones can also be used in search-and-rescue operations to examine ravines, canyons, cliffs, or other dangerous terrain. And on construction sites, drones can accomplish mapping and modeling without exposing inspectors to hazardous places and materials.

Cost. Drones are also much cheaper than manned alternatives. A single drone pilot can complete a job in just a few hours, simply by sending a drone over the worksite to capture data and images requested by the client. By contrast, traditional data collection requires teams of people and piloted aircraft—a process that takes longer and costs more.

C. Drone-enabled data collection is being used in transformative ways across the private and public sectors

Drones are a valuable tool that can facilitate efficiencies and improvements across multiple industries and sectors.

1. As described below, drone technology already has a wide variety of beneficial commercial uses.

Construction. Drone-enabled data collection is critical to real estate development. Before starting a construction project, developers need to understand the topography of the land. Topographic maps can identify drainage points, discrepancies in elevation, and other facts that impact the building process. Similarly, 3D models allow developers to make measurements and estimate the need for and cost of construction materials. During the life of a project, drones can help project managers to monitor progress and identify and trace errors when necessary.

Drones can also be used to measure stockpiles of raw materials, such as gravel, crushed stone, and sand. Traditionally, people had to climb stockpiles to measure volume—a process that was unsafe and often resulted in inaccurate measurements. With drone technology, measurements can be taken safely, quickly, and accurately.

Farming. In commercial farming operations, drones can be used to assess crop health. Visual depictions of crops can help farmers to detect problems like pest infestation and disease early, enabling them to address issues before they proliferate. Following

weather events like floods or tornadoes, drone-enabled data collection can help farmers understand the impact on their crops and take appropriate steps to mitigate damage to their business, including filing insurance claims for lost plants.

Energy. In the energy sector, drone-enabled data collection can be used to assess infrastructure equipment like wind turbines and solar panels. With their ability to fly and hover close to objects, drones can provide invaluable information about the health of wind turbines that could not be acquired with manned aircraft or ground observation. Using IR sensors, drones can detect problem areas on solar panels, thereby facilitating quick corrective action.

2. Outside the commercial realm, drone technology has numerous applications that serve the public good.

Conservation & Sustainability. Drone-enabled technology is vital to conservation efforts. For example, drones can be used to count endangered animals and evaluate vulnerable habitats.[3] When species live in hard-to-reach terrain, it is difficult to assess their numbers through ground observation or manned aircraft. Drones facilitate the creation of ortho maps and 3D models that can reveal animals obscured by their environment. Drone-captured data can also enable research on the environment itself.

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[3] *See* Rebecca Lehman, *Counting endangered penguins in the South Pacific: DroneDeploy and The Tawaki Trust*, DRONEDEPLOY (Apr. 26, 2024), https://www.dronedeploy.com/blog/counting-endangered-penguins-in-the-south-pacific-dronedeploy-and-the-tawaki-trust.

Likewise, drone technology can be used to capture, monitor, and therefore preserve, historical sites.

Crisis Response. Drone photography also plays a key role in preparing for and responding to natural disasters.[4] Drone technology can help firefighters create 3D maps of at-risk areas to help predict where a fire might start. Armed with that information, firefighters can take preventative measures like performing controlled burns or removing excess vegetation in order to mitigate risk. Once a fire has begun, drone technology can help firefighters uncover "hot spots" and allocate water resources accordingly.[5] After a fire is contained, drone technology can help disaster relief teams assess the structural integrity of a building before rescue teams are deployed.[6] Similar uses of drone technology can be deployed in

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[4] *See Optimize Disaster Relief Efforts with Drone Insights*, DRONEDEPLOY (June 16, 2021), https://www.dronedeploy.com/blog/optimize-disaster-relief-efforts-with-drone-insights; *How Firefighters are Using Drones to Save Lives*, DRONEDEPLOY (Mar. 17, 2020), https://www.dronedeploy.com/blog/how-firefighters-are-using-drones-to-save-lives.

[5] The Los Angeles Fire Department used this technique during the Skirball wildfire. *See* Hailey Branson-Potts, *L.A. Fire Department used drones for the first time during Skirball fire*, LOS ANGELES TIMES (Dec. 14, 2017), https://www.latimes.com/local/lanow/la-me-ln-lafd-drone-skirball-fire-20171214-story.html.

[6] The London Fire Brigade used this strategy after the Grenfell Tower fire. *See* Marco Margaritoff, *A Drone Helped Firefighters Combat the London Grenfell Tower Inferno*, THE DRIVE (June 20, 2017), https://www.thedrive.com/article/11701/a-drone-helped-firefighters-combat-the-london-grenfell-tower-inferno.

anticipation of and response to floods, earthquakes, and hurricanes.[7]

Law Enforcement. Drone technology is also an effective tool for law enforcement. Utilizing 3D models, police departments and other investigative bodies can document and recreate crime scenes. Measurable ortho maps can be used to recreate motor vehicle crashes, allowing investigators to determine vehicle speeds and directions, among other things.

II. THE FOURTH CIRCUIT'S DECISION THREATENS THE COMMERCIAL-DRONE INDUSTRY AND CHILLS SPEECH

The Fourth Circuit's decision and others like it carry significant implications for the future of the drone industry.[8] If permitted to stand, the decision would constrain useful applications of drone technology and allow states to chill protected speech.

As Petitioner explains, what North Carolina regards as "the practice of land surveying" is

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[7] For example, Disaster Relief Australia used drone technology during the immediate aftermath of Indonesia's catastrophic earthquake and tsunami in 2018. The organization flew 42 missions, which captured 6,000 images over 140 acres of land. As a result of this data, the team was able to identify fallen structures and start rescue operations within 24 hours. *See Optimize Disaster Relief Efforts with Drone Insights*, DRONEDEPLOY (June 16, 2021), https://www.dronedeploy.com/blog/optimize-disaster-relief-efforts-with-drone-insights.

[8] As Petitioner explains, the Ninth Circuit's decision in *Crownholm v. Moore*, No. 23-15138, 2024 WL 1635566 (9th Cir. Apr. 16, 2024), similarly failed to recognize the burden on speech affected by land surveying licensing regimes. *See* Pet. 23 (citing *Crownholm*, 2024 WL 1635566, at *2).

extremely broad. *See* Pet. 7-10. North Carolina has expanded the meaning of land surveying beyond traditional surveying activities like establishing boundary lines and easements, which define landowners' property rights, to encompass projects that do not implicate property rights at all. For example, the statute now covers "mapping *** relative to the location, size, shape, or physical features of the earth, improvements on the earth, the space above the earth, or any part of the earth." N.C. GEN. STAT. § 89C-3(7)(a); *see also id.* § 89C-3(7)(a)(5)-(6); 1998 N.C. Sess. Laws 118 (H.B. 794).

According to the North Carolina Board of Examiners for Engineers and Surveyors ("Board"), unlicensed drone operators may not engage in "aerial surveying and mapping services" or produce "any resulting map or drawing," "3D models," or "aerial photogrammetry." Pet. App. 34a. Even the simplest tasks—like processing images of a building into a 3D model to give "a sense of its appearance from all sides," and processing images into a map that can be used to generate rough distances—fall under the State's definition of land surveying. Pet. App. 35a. Indeed, the definition is so broad that it would encompass widely available consumer geo-information technologies, like Google Earth.

Under the Board's guidance, a drone operator can lawfully give customers aerial images of land only "[i]f there is no meta data or other information about coordinates, distances, property boundaries or anything that falls within the definition of land surveying[.]" Pet. App. 35a. In other words, drone

operators can convey images so long as they do not include most of the information the customer needs.

North Carolina is not alone in utilizing an overly broad definition of surveying. Under California law, "practic[ing] land surveying" encompasses "[l]ocat[ing], relocat[ing], establish[ing], reestablish[ing], or retrac[ing] the alignment or elevation for any of the fixed works embraced within the practice of civil engineering," and covers anyone who "[d]etermines the information shown or to be shown on any map or document prepared or furnished in connection with" those activities. *See* CAL. BUS. & PROF. CODE § 8726(a)(1), (7). Regulators interpret the law to apply to maps that "depict the location of property lines, fixed works, and the geographical relationship thereto." Pet. for a Writ of Cert. 10, *Crownholm v. Moore*, No. 24-276 (U.S. Sept. 9, 2024) ("*Crownholm* Pet.").[9]

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[9] Other states have similarly expansive definitions. For example, Delaware law provides that the "[p]ractice of land surveying" includes, among other things, "[t]he act of measuring [and] locating" "angles, elevations, contours and natural and manmade features in the air, [or] on the surface or subsurface of the earth," "for the purpose of determining or establishing facts of size, area, shape," or "topography." *See* DEL. CODE ANN. tit. 24, § 2702(5)(a). Florida's statutory definition of the "practice of surveying and mapping" includes similar language, but it is even broader in scope. Specifically, Florida's definition includes the act of "measuring" and "locating" this information "for the purpose of determining, establishing, *describing, displaying, or interpreting*" facts of size, volume, shape, or topography, among other things. FLA. STAT. § 472.005(4)(a) (emphasis added). Additionally, Florida's statute covers "photogrammetric control," the "orientation of improved or unimproved real property and

Because of their expansive definitions of land surveying, North Carolina and California impose licensing requirements on a wide variety of actors and activities. *See* Pet. 8-9; *Crownholm* Pet. 9-12. Obtaining a surveyor license is an arduous process with time-consuming and costly requirements. *See, e.g.*, N.C. GEN. STAT. § 89C-13(b)(1a)(d) (requiring those without a surveying degree to show nine years of practice experience); *id.* § 89C-13(b)(1a) (requiring all applicants to pass examinations, provide references, and submit to a character-and-fitness inquiry); *id.* § 89C-14 (requiring applicants to pay written examination fees and requiring corporations to pay certification fees); CAL. BUS. & PROF. CODE § 8742(a)(2) (requiring those without a surveying degree to show six years of practice, including one year of "responsible field training" and one year of "responsible office training"); *id.* § 8741(a), (d) (requiring all applicants to pass examinations).

The burdens of obtaining a surveyor's license are not offset by benefits to safety and accuracy. As described above, software offered by DroneDeploy and others allows users to create maps and models that reliably show distances and other relevant data. Nothing about the training or other qualifications

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appurtenances and personal property attached thereto," "the measurement of and preparation of plans showing existing improvements after construction," and "the layout of proposed improvements." *Id.* § 472.005(4)(b).

required of land surveyors is needed to improve the accuracy of those products.[10]

As Petitioner's case shows, licensing requirements will be cost-prohibitive for many small-scale drone operators. But failing to recognize the speech-infringing character of those regimes has implications beyond small-scale operators. The business-to-business and conservation and safety-related applications of drone technology discussed herein will also be impacted by the Fourth Circuit's decision and others like it. *See, e.g.*, *Crownholm*, 2024 WL 1635566. To cite just one common example, tracking the progress and accuracy-against-plan of a construction project requires both relative geographic locations (i.e., position relative to other locations within a model or data set) and absolute geographic locations (i.e., position relative to true location in the real world) for key structural components. The Board's overly broad reading would eliminate this and other use cases unless these drone missions were performed by licensed surveyors. As explained, that qualification would severely limit the availability of permitted operators with no offsetting improvement in the accuracy of the resulting data.

If states are permitted to demand that drone operators comply with burdensome and rent-seeking licensing schemes, the drone industry's activities will grind to a halt. Chilling that burgeoning industry will

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[10] Small unmanned aerial vehicle ("UAV") pilots are subject to the Federal Aviation Administration's separate licensing requirements, *see* 14 C.F.R. § 107, which are designed to ensure that commercial drone operations are conducted safely with regards to nearby persons and other aircraft.

burden the individuals and entities that rely on drone-enabled data collection to build new construction, monitor properties, crops, and energy infrastructure, and engage in the conservation and crisis-response activities that benefit the public at large.

CONCLUSION

For the foregoing reasons, the petition for a writ of certiorari should be granted.

Respectfully submitted.

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