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Congress of the United States
House of Representatives
Washington, DC 20515

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May 2, 2025

The Honorable Tom Cole
Chairman
House Appropriations Committee
Washington, DC 20515

The Honorable Rosa DeLauro
Ranking Member
House Appropriations Committee
Washington, DC 20515

Dear Chairman Cole and Ranking Member DeLauro:

I am requesting funding for the Foundational Data and Applications for Coastal/Flood Resilience project in fiscal year 2026. The entity to receive funding for this project is the Research Foundation of the City University of New York, located at Hunter College, 695 Park Avenue. NY, NY 10065. The funding would be used to support the acquisition, quality assurance, product development and application development of foundational data sets for climate resilience including LiDAR at 20 points per meter squared, and (ortho) photography at nadir and four oblique angles, at a resolution of 7.5cm, for the entire City of New York.

In 1996, the Center for Advanced Analysis of Spatial Information (CARSI), under the directorship of Dr. Sean C. Ahearn, managed the creation of the first photogrammetric-based map of NYC. The base map included the mapping of buildings, roadbeds, and over 20 other planimetric features. When 911 occurred, the base map became pivotal in the recovery from this crisis. Every city department used it in some way as part of their role in this recovery effort, from the referencing of images taken of ground zero, to building inspection and determination of which roads to open, to logistical operations of the FDNY.

CARSI continued with the update of the base map in 2002 and 2004 with additional enhancements to resolution and accuracy. The New York City (NYC) government took over after that, and they have not advanced the quality of the base map in 20 years. So, while NYC was the technological leader in Spatial Data Infrastructure in 2004, it is now woefully behind other cities both nationally and internationally. When Superstorm Sandy occurred, billions of dollars in damages occurred, much of which could have been avoided. For instance, there was never an attempt by the NYC Government to intersect critical infrastructure with flood maps derived from digital terrain data for different storm surge scenarios.

The result was that they never saw the vulnerability of the Con Edison Plant (7 feet above sea level) on 23rd Street, which resulted in the blackout of downtown Manhattan when it was flooded. The NYU hospital flooding cost 1 billion dollars (5 feet above sea level), which could have been detected if this analysis had been done. These are but just two examples. Going

forward, this type of analysis is critical for future super-storms like Sandy, and the need for highly accurate flood potential with geographic specificity is essential. This data acquisition and subsequent analysis will provide this accuracy and capability. The acquisition of the proposed data sets enables the development of products like a Digital Surface Model (DSM) for calculating the extent of different flood scenarios, and a 3-D model with a very high degree of accuracy and verisimilitude, for analyzing the impact of flooding both on critical infrastructure and populations.

Accuracy of the City's Planimetric base-map and its DSM will increase by a factor of 2 to 3 with these new data. Storm surge flooding scenarios and flash floods will be more accurately modeled, and a new highly accurate 3-D model will be the first step in the development of a NYC "Digital Twin". These data and the models created will be essential for major weather events that hit the city, but will also play an essential role in the day-to-day management of the City. Greater accuracy means more certainty when making operational decisions.

The project can be described as geospatial information infrastructure development. Operationally, Hunter College's CARSI lab will subcontract with a mapping company to acquire LiDAR data at 20 points per meter2 and photography at a digital resolution of 7.5 cm. The LiDAR produces a blanket of points, each with an x, y, z coordinate that can be turned into a grid of elevations. With 20 points/meter squared, a digital grid (DSM) can be created at 15cm resolution. The photography will be taken from 5 look angles: nadir (which will be used to create orthophotography) and four oblique angles, two from each direction perpendicular to the line of flight, which collectively will be used to create the 3-D model of the City of New York. CARSI will be involved in project specification, quality assurance of the products, and overall project management.

The project is an appropriate use of taxpayer funds because funding for this project will increase the resilience of the NY-12 in the face of major climate events by having more accurate information about how different levels of flooding, both storm surges and flash floods, impact different parts of the infrastructure and which are most vulnerable. Billions of dollars spent in the recovery from Hurricane Sandy could have been avoided if this intersection of different storm surge levels and critical infrastructure had been performed as part of a resilience effort (e.g. the ConEd plant on 23rd street and the NYU Hospital). The data collected will become the foundation for the next generation of the City's geospatial information infrastructure, the Digital Twin, which will not only be essential for increasing the City's resilience in the face of Climate Change but will also be fundamental to the mission of each of the City's agencies, making them smarter and more efficient. Local communities will have a better understanding of the impact that different storm events will have on their community and how they can be attenuated. The three-dimensional, immersive environment of the Digital Twin will enable them to virtually experience both an event and how they would respond, thus increasing their resilience as a community.

FEMA maps would not suffice because those maps are using a much coarser spatial resolution for the digital surface model (derived from LiDAR in our proposal) and will miss many areas that will flood given a certain storm surge level. Also, FEMA maps aren't good for local rainfall events which require very detailed terrain models. LiDaR has multiple uses, and we have used it

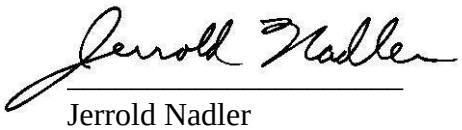
to look at the solar potential of buildings in NYC (https://nysolarmap.com/ ). The second set of data, the aerial photography, is used to update the NYCMap, which includes over 25 features like HVAC units on rooftops, curb lines, water towers, sign gantries, etc. We last completed this update in 2022 and found the imagery used for the analysis to be insufficient. With the higher resolution in this new data acquisition, we can include features like window air conditioners and other smaller but important features.

The other main driver for these data acquisitions is that they will enable us to create a "Digital Twin" of the City, which will enable us to conduct virtual evacuations during events and provide real-time warnings to citizens who may be in danger.

The project has a federal nexus because the funding provided is for purposes authorized by the Coastal Zone Management Act of 1972 (16 U.S.C. § 1451 et seq.).

I certify that I have no financial interest in this project, nor does anyone in my immediate family.

Sincerely,



Jerrold Nadler
Member of Congress