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<p style="text-align:center">Street Floodings in NYC: Challenges and Possible Solutions</p>

What's the issue?

   As a global economic and cultural hub, New York City (NYC) faces the growing complex risk of natural disasters like flooding. Street flooding severely impacts NYC due to the vast amount of infrastructure and public transportation systems. Flooding from heavy precipitation can result in costly damage to homes, roads, and bridges in NYC (Office of Climate Change)[1]. To address the street flooding problem, several solutions can be provided. One recommendation is to let citizens report street floods via online platforms like NYC 311. The modeling of street flooding can reduce the economic and social effects of severe storms in urban developments (Agonafir et al., 2022)[2]. The following recommendation is based on the sewer system within the city. By mapping the comprehensive underground sewer system, we are helping decision makers to analyze the area that lacks sewer functions and locate the potential flooding area. The third recommendation is about green infrastructure. The main philosophy of the green infrastructure that aims at water management is to build an environment that simulates the natural water cycle processes, avoids the generation of runoff and mixing with wastewater, and absorbs the potential flooding water (RADINJA et al., 2021).

Background/Context of the Issue or Problem to be Addressed:

   The city experiences a staggering annual average precipitation of 1270mm, resulting in significant yearly precipitation (Agonafir et al., 2022). Also, according to the geography measurement, approximately 72% of the land area of NYC is covered

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[1] Office of Climate Change https://www.dec.ny.gov/energy/94702.html#Impacts

[2] Agonafir, C., Pabon, A. R., Lakhankar, T., Khanbilvardi, R., & Devineni, N. (2022). Understanding New York City street flooding through 311 complaints.

with impervious surfaces (City of New York, 2020a)[3]. Combining these two critical factors makes it evident that NYC is exceptionally susceptible to street flooding, making it one of the most vulnerable cities to this issue.

It is commendable to allow citizens to participate in street flooding reports through online platforms and apps because citizens have always been one of the city's primary data sources, and massive data also helps decision-makers better model the city's drainage—and flood mitigation systems. However, data ownership and privacy become issues. Once data is leaked, privacy issues such as users' addresses will also be accurately analyzed by big data, not to mention third-party data processing to help build urban flooding models.

Mapping the city's sewer lines has been a solution NYC has been pursuing. However, Sewer information is hard to find and very cryptic, yet crucial to the city's functioning. We want more people to know how the system works and feel empowered to improve it (NYC Open Data, 2022).[4] Exploring the already-built water conservancy system and statistics is a vast project, and this process requires huge funds to support the advancement of the entire project.

Policy Recommendations:

As far as green infrastructure is concerned, we lack land to build enough green space and soil. However, because plants and soil have strong water-absorbing properties, small areas of soil and green plants can also play an essential role in flood control. We can consider constructing small or micro-area green plants and rain gardens. For example, combining parking lots with green infrastructure is very feasible. Green plants serve as guardrails, decorations, or landmarks in the city. They serve as infrastructure and solve environmental problems in the city. Flooding and stormwater runoff are often a problem due to the impermeable surfaces of concrete

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[3] City of New York a. Impact of NYW Bonds. Retrieved from https://www1-nyc-gov.proxy.library.nyu.edu/site/nyw/investing-in-nyw-bonds/the-impact-of-investing.page. Accessed 30 Dec. 2020.

[4] NYC Open Data https://opendata.cityofnewyork.us/projects/open-sewer-atlas-nyc/

and other materials used in parking lot construction. Eraslan and Seçme (2018) discussed the urban heat island effect, arguing that geographical features such as green roofs and walls can insulate buildings, creating a more sustainable and energy-efficient parking lot (Evans et al., 2023).[5]

Reference

[5] Evans, A., & Hardman, M. (2023). Enhancing green infrastructure in cities: Urban car parks as an opportunity space. Land Use Policy, 134.

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NYC Open Data

https://opendata.cityofnewyork.us/projects/open-sewer-atlas-nyc/

Office of Climate Change

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