

Data Driven Approach to Enhance Street Sweeping in Urban Areas

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Abstract

This study aims to develop a data driven approach to enhance street sweeping in urban areas. Street sweeping can be an effective nonstructural best management practice to reduce stormwater runoff pollution from impairing nearby waterbodies. Factors that can influence the effectiveness of street sweeping include sweeping frequency, sweeper type, number of passes, pollutant loadings, and particle size¹. For this experiment, street solids and stormwater samples will be collected over the course of a year on different roads, each with varying characteristics, around Warwick, RI to understand the trends in pollutant accumulation. Each road segment is characterized by its surrounding land use, impervious surface area, canopy coverage, building density, and road quality to determine how these are related to varying pollutant loadings. The samples are divided into particle size fractions and analyzed for concentrations in heavy metals, nutrients, PAHs, and microplastics. This data collection will be used to evaluate the relationships between pollutant accumulation and the environmental and geographic factors listed above to assist in optimizing street sweeping frequency and methods.

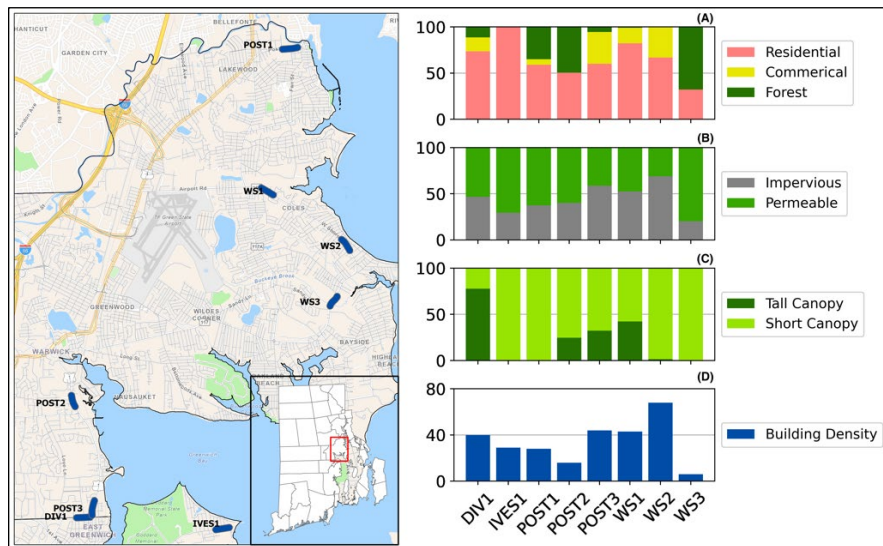


Figure 1: The map shows the 8 road segments in Warwick, RI in which sampling will occur. The graphs portray the land use (A), impervious surface area (B), canopy coverage (C), and building density (D) summaries for the 250ft buffer zone around each road segment.

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References

[1] R. Pitt, R. Bannerman, and R. Sutherland, “The Role of Street Cleaning in Stormwater Management”, Environmental and Water Resources Institute, 2004.