Urban Waste Analytics

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Domain: City Operations, Urban Sustainability
Student Size: 3

Problem Definition and Scope

Block level modeling and forecasting of municipal waste generation and recycling in NYC. Daily waste data at sub-district level over 10 years are used to develop a waste generation model incorporating human factors (demographics etc), geographic factors (density etc) and temporal factors (seasons, etc), as well as weather impacts analyzed using data over the same time period from the long island high resolution radar. The model is then used to forecast block level waste generation on daily basis.

Agency Involvement

Department of Sanitation (DSNY) has provided the data and is an active participant.

Skills/Methodologies

Machine learning, GIS.

Broader Impact and Intellectual Merit

New York City generates over 11,000 tons of waste household waste per day. There are operational challenges from the point of view of handling, within the city and across the thousands of miles of destination trails. There are also disposal challenges impacting the quality of life and environmental impact including energy usage. This research aims to facilitate better agency operation, while developing a better understanding of waste generation dynamics in cities.

Data Sources

- 10 years of sub-district daily data
- 10 year of high resolution weather data from the long island based instrument.
- Ongoing daily sub-district data

Project Deliverables

Model for forecasting block level waste generation in NYC.

Timeline and Milestones

- Week 1 to Week 4: Data Organization toward interoperable data on waste, demographics and time.
- Week 5 to Week 10: Modeling block level waste generation based on historical records
- Week 11 to Week 12: Model testing and validation using ongoing daily records.
- Week 13 to Week 16: Reporting and publishing

Dissemination Plans

- Model as product to the agency
- Conference publication and presentations
- Journal Publications