

# Socially Informed Services Conflict Governance through Specification, Detection, Resolution and Prevention

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# Project Overview

## Project Vision

- **Design** a socially informed conflict management theory in an uncertain environment to address city service conflicts
  - Resource Conflicts
  - Environment Conflicts
  - Human Conflicts
- **Ensure** *social inclusion* and *equity* when managing service conflicts for
  - City operators,
  - Service providers,
  - Residents



# Project Overview

## Use-Inspired Research

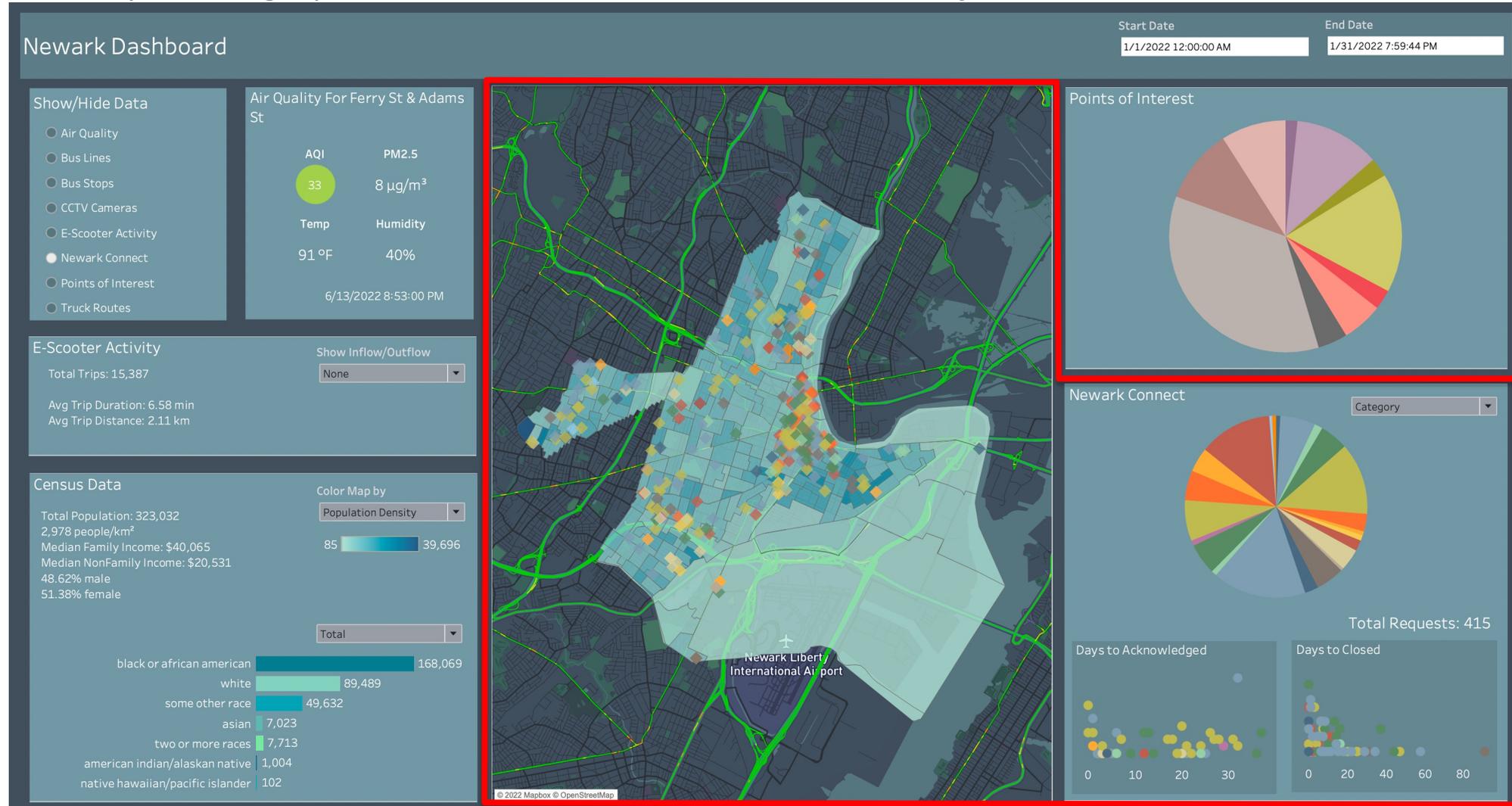
- Managing conflicts between city services of Newark NJ
- Designing a Dashboard Tool to formally specify, detect, resolve and prevent conflicts for
  - City operator (e.g., Newark Office of IT)
  - Service providers (e.g., Newark Depts. of Public Work and Public Security)
- Augmenting a Newark Connect App based on Newark Community Partner Needs

## Fundamental Research Contributions

- An Equitable and Inclusive Approach to Designing Smart Services
- A Socially Informed Computational Service Conflict Management Framework
- A Social Intervention Approach to Making an Impact on Diverse Community Stakeholders

# Project Update

- Integrating services and community into centralized dashboard monitoring and controlling
  - Air quality monitoring, Public Transportation, Micromobility, Public Safety Surveillance, Social networks
  - Community: Demographics, **Interactions between Community and Service Providers**



# Project Update

- Integrating services and community into centralized dashboard monitoring
  - Air quality monitoring, Public Transportation, Micromobility, Public Safety Surveillance, Social networks
  - Community: Demographics, Interactions between Community and Service Providers
  - 5 Air Quality sensors deployed and operated online by our project team
- Research: 23 Publications
  - Intelligent assistant system for requirement specification
  - Single-service monitoring and prediction
  - Multi-service integration and coordination
  - Social factor in services
  - Public service review
- Community outreach:
  - Biweekly working meetings with community partners
  - Public Service Deliberation Panel
  - OIT NSF Smart and Connected Cities Working Lunch Meeting
  - Focus group study
- Education:
  - Graduated 2 Ph.D. students
  - Involving 9 graduate students and 7 undergraduate students



# Project Evolution

	<b>What we learn from community?</b>	<b>How we adjust our activities?</b>
Newark Sensing Infrastructure	Some City Sensors are malfunctioning <ul style="list-style-type: none"><li>• CCTV Cameras</li></ul>	We readjust our pilot study locations to focus on areas with high quality sensor data
Newark City Priority	<ul style="list-style-type: none"><li>• Truck violation is of high priority</li><li>• Air quality Sensing and Improvements</li></ul>	<ul style="list-style-type: none"><li>• We focus on a special service of truck violation detection based on sensing and intervention infrastructures</li></ul>
Newark Community Engagement Tool	Less dissemination of existing tools	<ul style="list-style-type: none"><li>• Explore more dissemination ways</li><li>• Education sessions</li></ul>

# Evaluating Project Impact on Communities

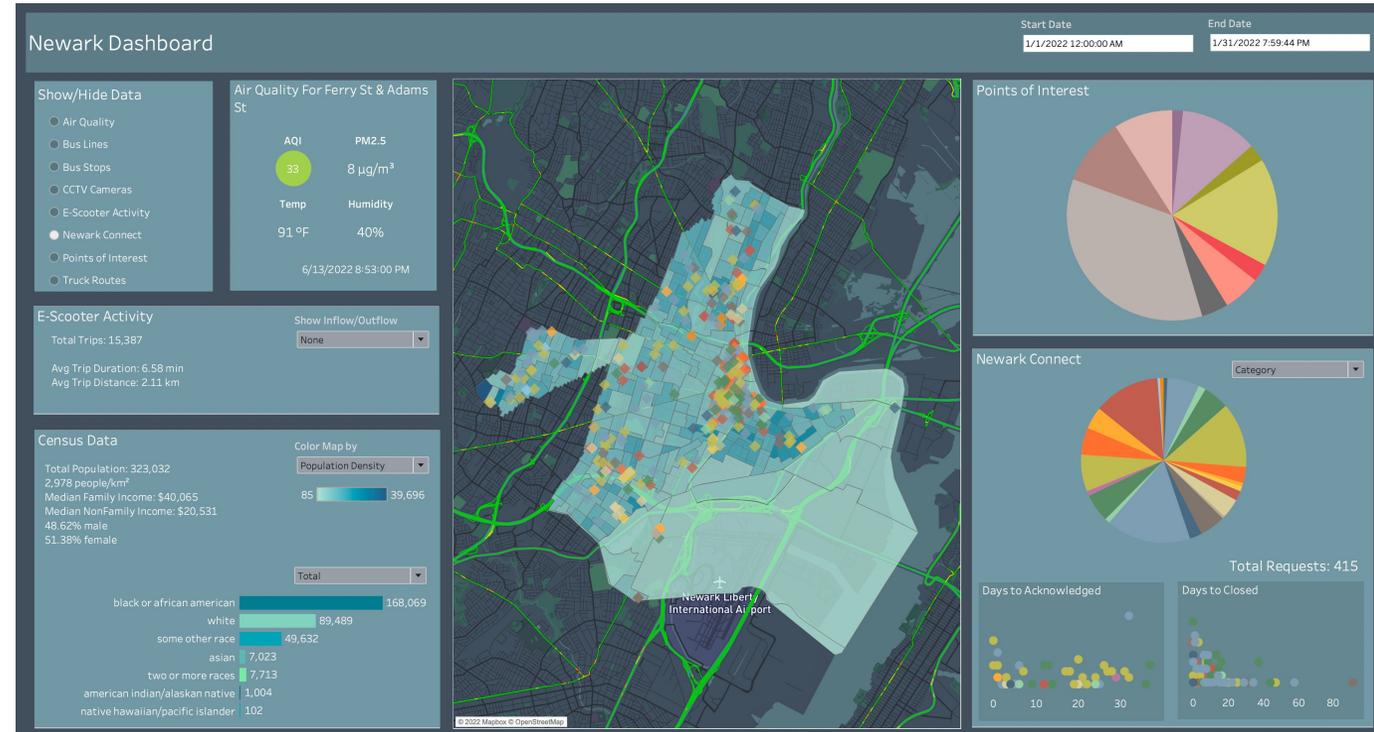
- **Service Monitoring:** Our community partners have used our dashboard to monitor different city services and their mutual impacts.
- **Service Quality:** Our analysis of the Newark citizen engagement platform Newark Connect has derived insights to improve public service efficiency and quality.
- **New service Initiative:** Our analysis on air quality and surveillance videos helps our community partners identify the most vulnerable area to initiate the pilot study of the new truck violation detection service.

# Anticipated outcomes & success measures for next year



## A Case Study for Service Conflict

- Truck Transportation in Residential Zones
- Impact of Their Conflict
- Existing Conflict Management Approach
- **Measures:** Air Quality, Traffic, Safety, Resident Satisfaction



## A Close-loop Conflict Management System

- Integration of existing requirements
- Real-time conflict alert
- Pipelines to action operators
- A set of user survey and user interviews
- **Measures:** Accuracy, Useability, Expressiveness, Equity, Fairness, Resilience, Representativeness