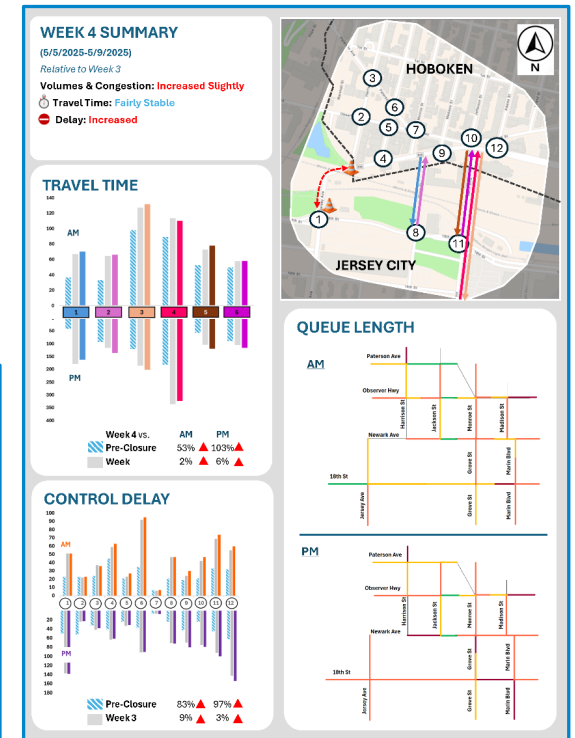


Coordinated Signal Optimization & Real-Time Monitoring to Maintain Urban Mobility During Major Disruptions



October 9, 2025



Today's Speakers



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The Flow Platform offers multiple solutions targeting a range of mission critical engineering workflows

Each project has different requirements. Various Flow Platform solutions align with a project's specific needs and objectives.



Traffic Signal Operations

From monitoring to diagnostics to optimization, Traffic Signal Operations solution provides a complete suite to manage signals end to end.



Mobility Management

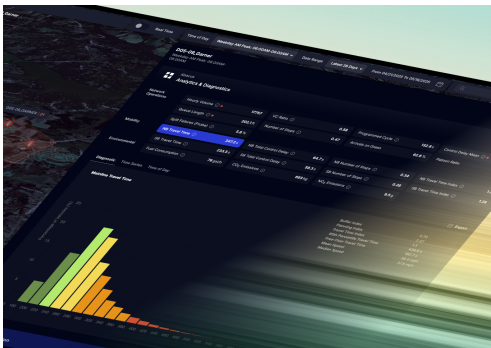
Flow Labs delivers a complete suite of mobility tools powered by connected vehicle data. Understand how traffic moves, where trips begin and end, how freight flows, and what it all means for emissions—without relying on surveys, models, or hardware.



Roadway Safety

Flow Labs provides a full suite of safety tools to help agencies identify risk, diagnose root causes, and quantify the impact of every intervention.

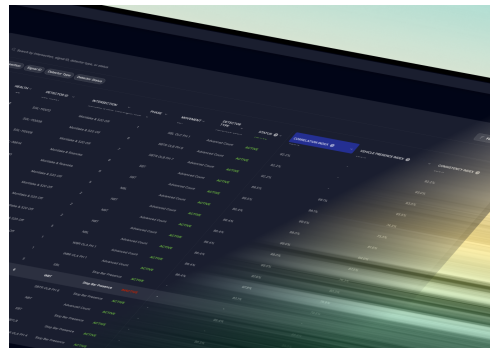
Flow Labs's innovative product suite supports every stage of the traffic signal management process



Luminus

Probe-Based Performance Measures

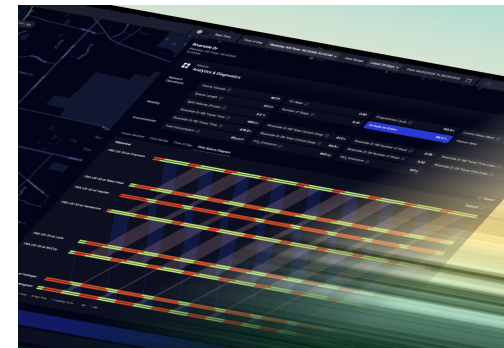
Probe Based Signal Performance Measures offer region wide visibility into signal performance without requiring any hardware.



Luminus Plus

Integrated Signal Performance Measures

Integrated Signal Performance Measures provide the most detailed signal performance insights by combining probe data and controller data.



Optimus

On-Demand Signal Optimization Software

Optimus allows engineering teams to accelerate and streamline the signal retiming process and generate new timing plans in a matter of minutes.

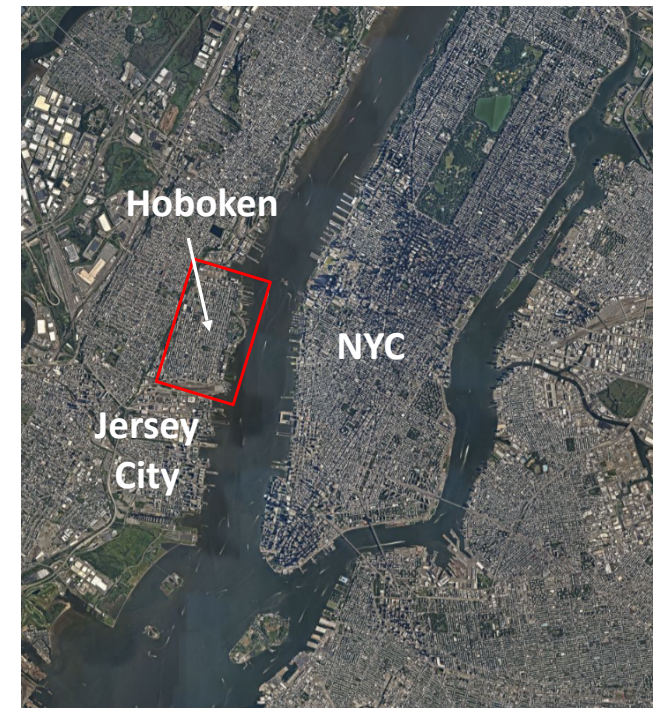
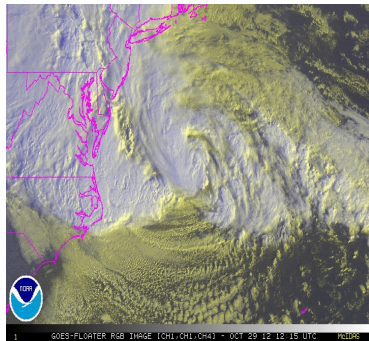
Project Use Case Example



City of Hoboken, New Jersey

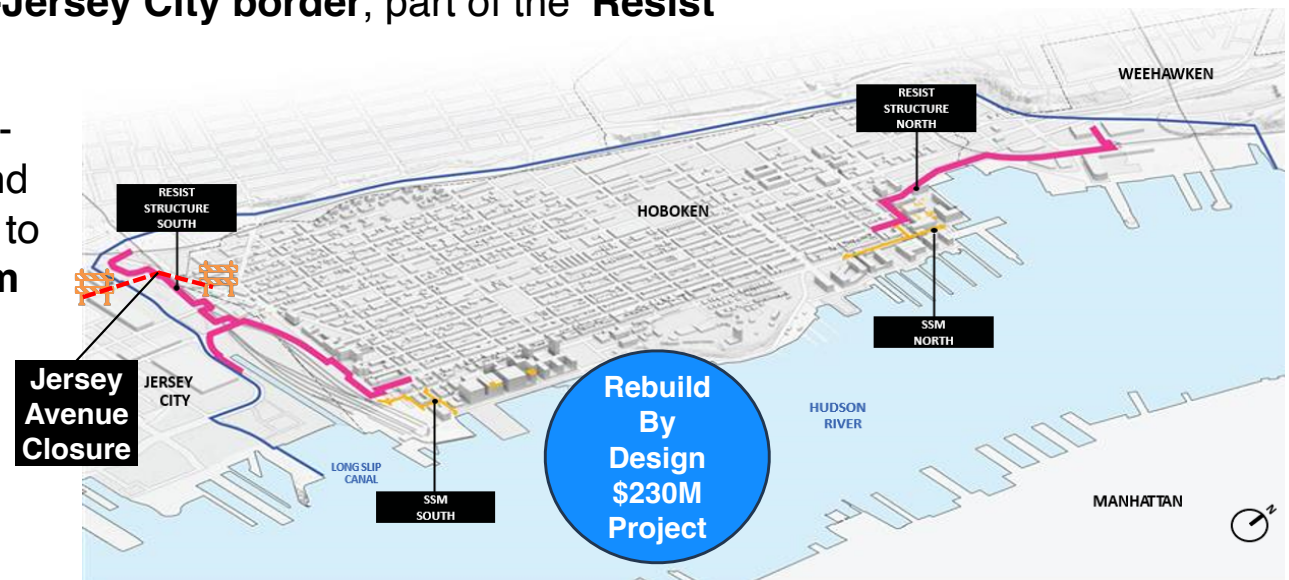
Super Storm Sandy

- In 2012, **Superstorm Sandy's** 14' storm surge highlighted Hoboken's vulnerability to flooding causing \$100M+ in damage
- The **Rebuild by Design Hudson River Project**, led by NJDEP and funded by the US Dept of HUD, was launched to protect the city from future storm surge events
- Key infrastructure includes **floodwalls with flood gates**, **resiliency park**, and other urban amenities



Background

- Construction in 2025 required **temporary closure of Jersey Avenue**, a vital north-south corridor between Jersey City and Hoboken
- **Coordinated strategy essential** for safety and mobility (traffic, emergency services, transit, and pedestrian access)
- **Sliding floodgate at Hoboken-Jersey City border**, part of the 'Resist' structure
- Floodgate connects to the 5,000-foot southern Resist structure and is deployed during storm surges to **block Hudson River water from entering Hoboken via the Long Slip Canal**



Traffic Management Strategy

- **Jersey Avenue was closed** 24/7 in both directions for one month and northbound for 3 months between Harrison Street (Hoboken) and 18th Street (Jersey City)
- The team developed and executed a plan to manage **traffic operations**
- Studied **16 signals** in Hoboken and Jersey City
- Performed **signal timing and phasing modifications**
- Incorporated **diversion volumes** and **existing conditions**
- Other multi-modal mitigations included **restriping** and lane assignment modifications,



Jersey Avenue detour at Grove Street



Jersey Avenue detour traffic



Construction activities



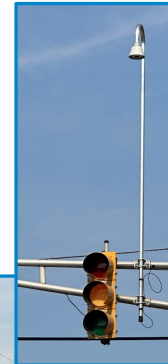
Construction activities

Traffic Mitigations – Physical & Digital

Infrastructure

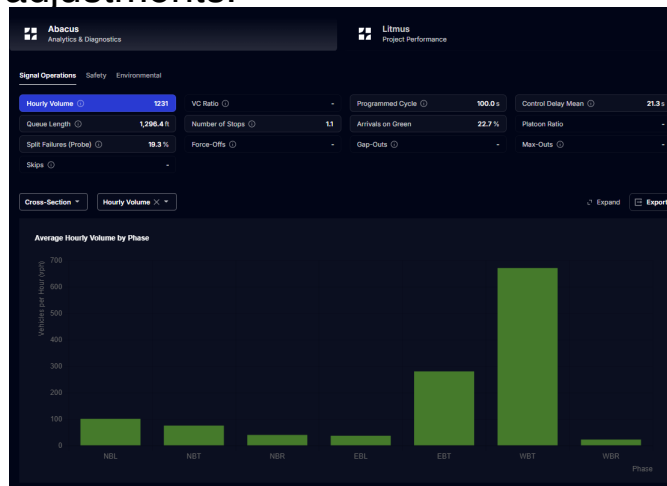
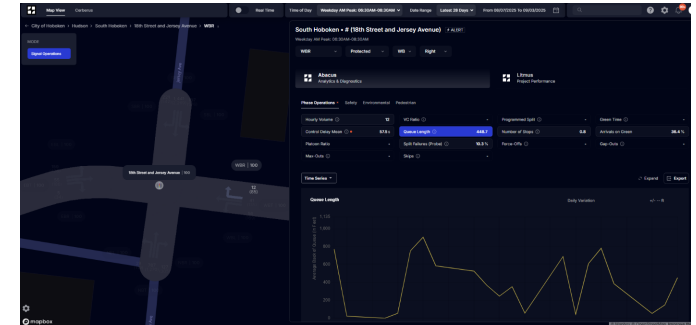
Temporary signing and striping modifications:

- Replaced on-street parking with additional travel lanes along Grove St.
- Extended left turn storage on 18th St.
- Implement optimized timings at 16 intersections
- Installed Miovision Core with cellular communications at four critical intersections
 - Two in Hoboken – existing Trafficware Controllers
 - Two in Jersey City – existing Econoline Controllers



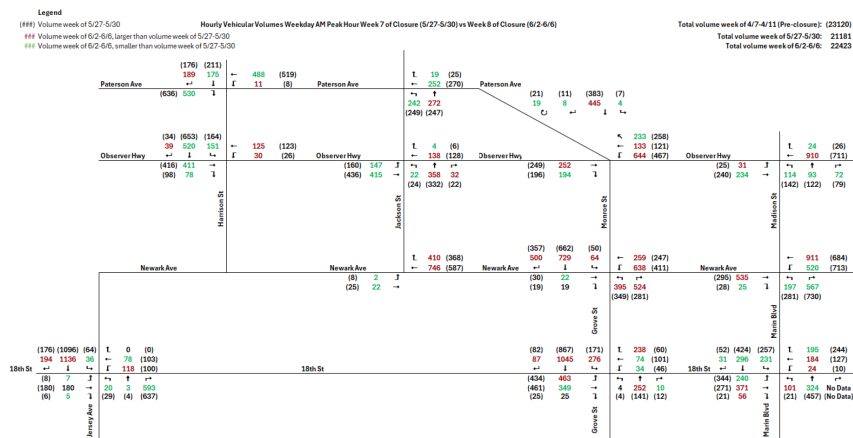
Traffic Management Solution

- Needed Turning Movement and volumes for analysis
- Flow Labs **historical data** used to model pre-closure traffic volumes and turning movements for detour and mitigation analysis.
- Flow Labs **real-time** data applied during construction to validate traffic operations and implement necessary adjustments.



Traffic Signal Optimization

- **Before implementation:** Flow Labs data was used to evaluate proposed signal timing and lane striping changes.
- **After implementation:** Flow Labs data was used to assess the impact of those changes.



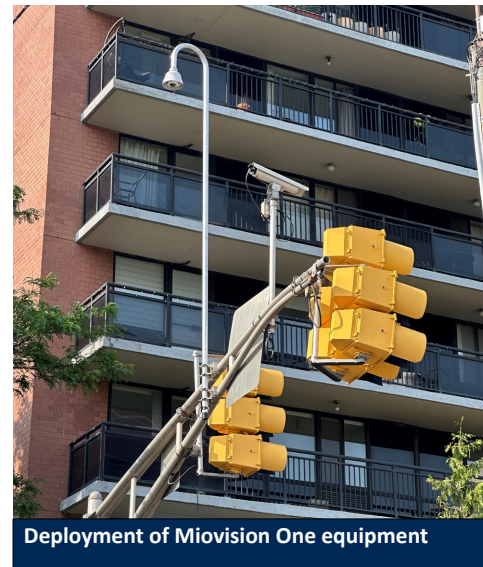
Volumes derived from Flow Labs data



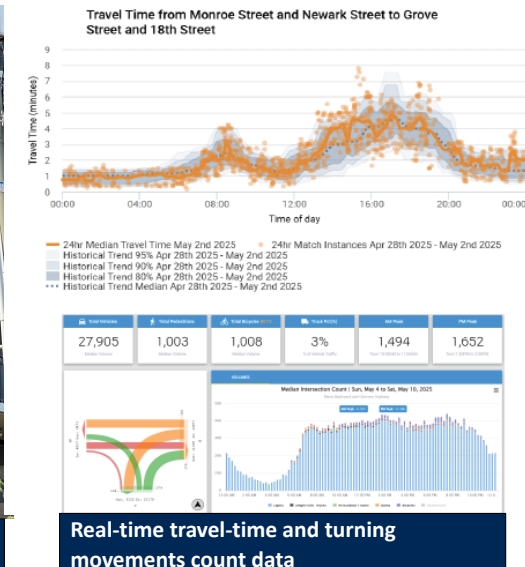
Traffic Analysis updated based on Flow Labs data

Real-time Monitoring

- **Advanced traffic management** technologies deployed
- **Real-time signal monitoring** and coordinated signal optimization during closure
- **Probe-Based Signal Performance Measures** using GPS data from fleet and ride-share vehicles
- **KPIs** to monitor delay and queue lengths
- **Video analytics** for vehicle classification, speed, pedestrian/bicycle detection, and safety analysis



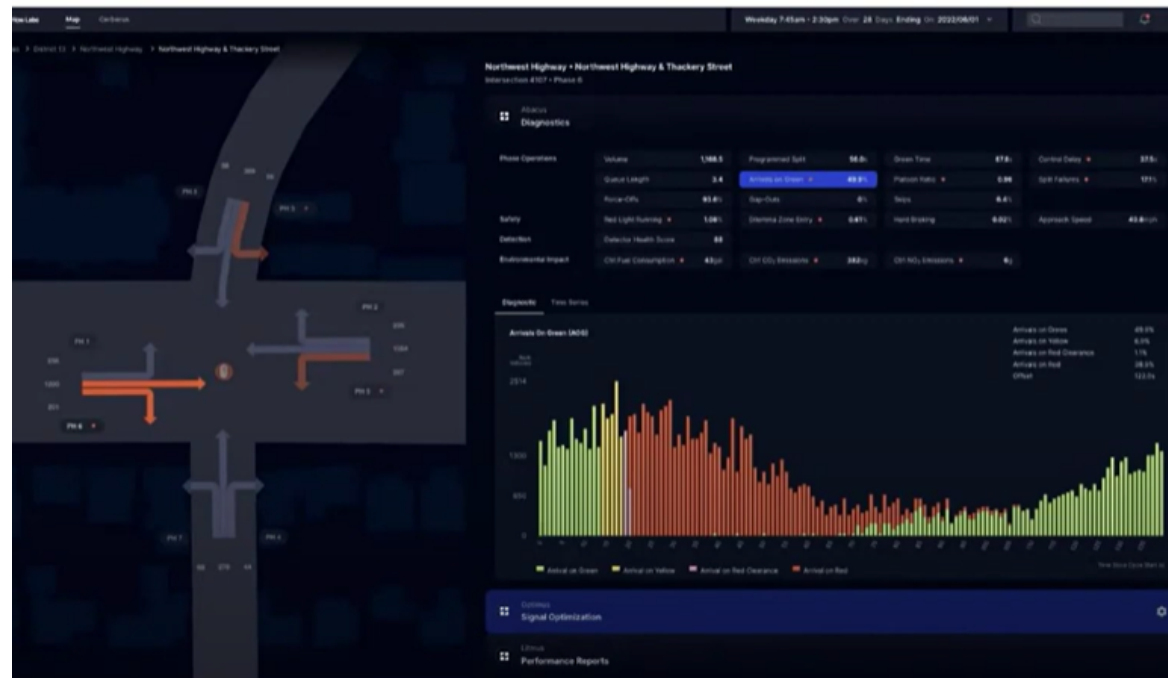
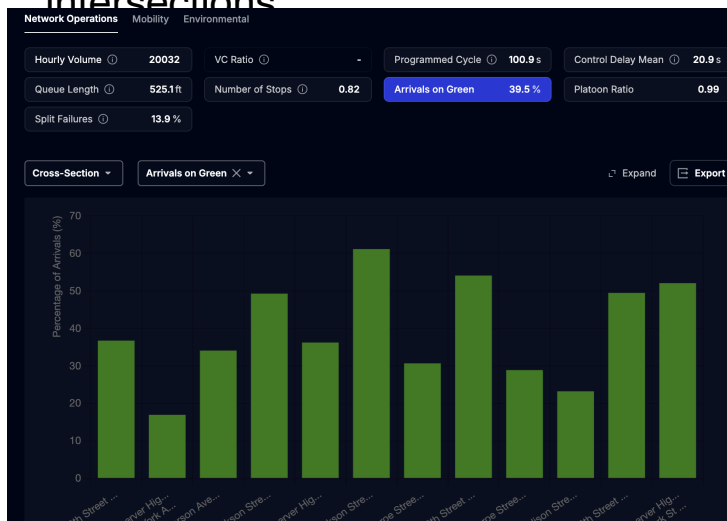
Deployment of Miovision One equipment



Real-time travel-time and turning movements count data

Real-time Monitoring

- **Flow Labs live and historical traffic data** for all intersections
- **Before /after mitigation comparisons**
- **Timing optimization** at various intersections



Example: Jersey Ave Full Closure vs just Northbound Closure

WEEK 4 SUMMARY

(5/5/2025-5/9/2025)

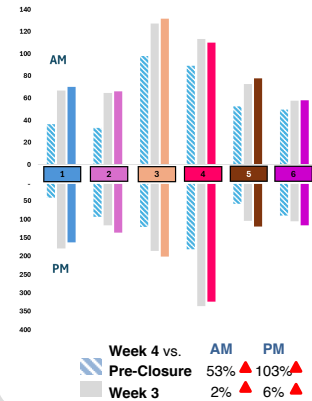
Relative to Week 3

Volumes & Congestion: **Increased Slightly**

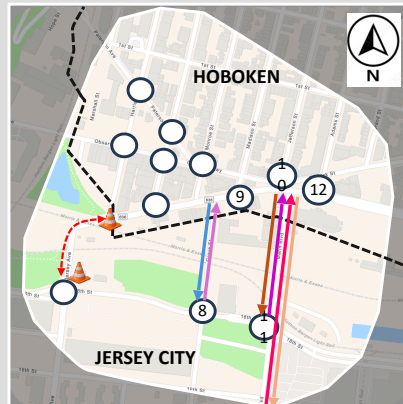
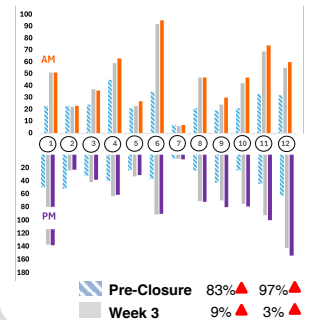
🕒 Travel Time: **Fairly Stable**

🚧 Delay: **Increased**

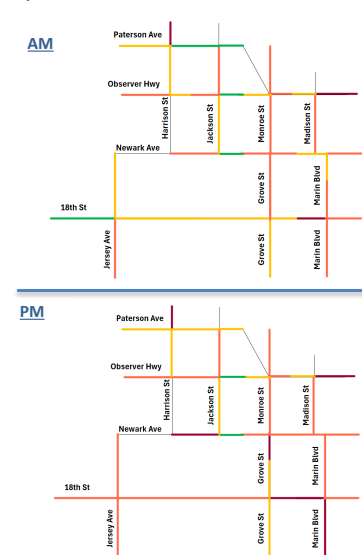
TRAVEL TIME



CONTROL DELAY



QUEUE LENGTH



WEEK 10 SUMMARY

(6/16/2025-6/20/2025)

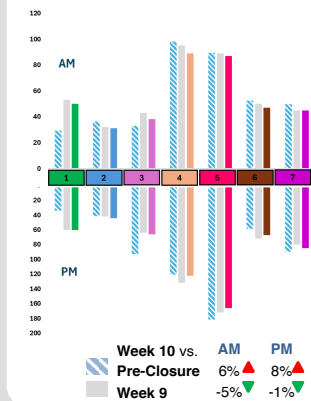
Relative to Week 9

Volumes & Congestion: **Decreased**

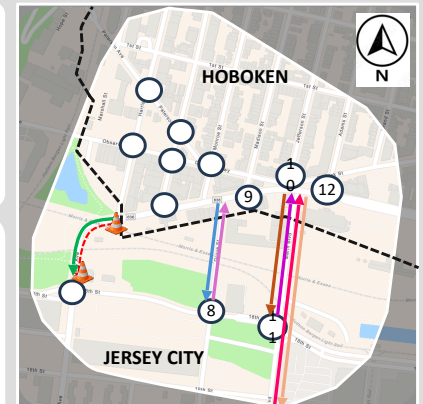
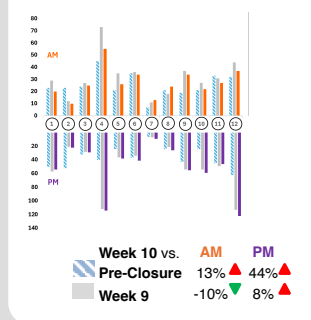
🕒 Travel Time: **Decreased**

🚧 Delay: **Remained Stable**

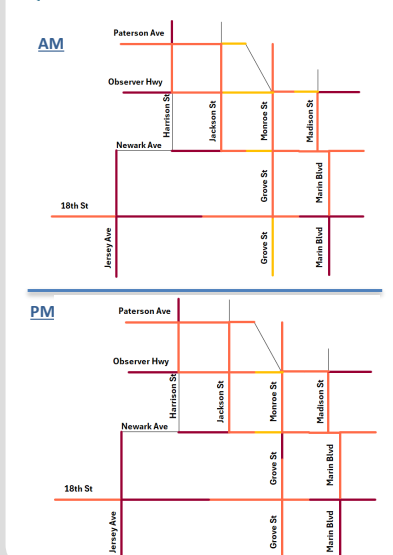
TRAVEL TIME



CONTROL DELAY

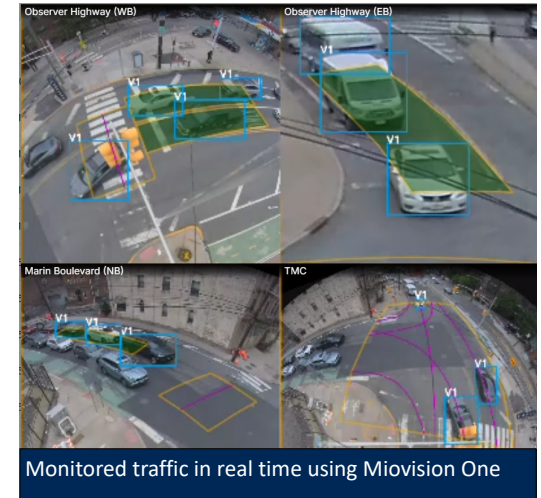


QUEUE LENGTH



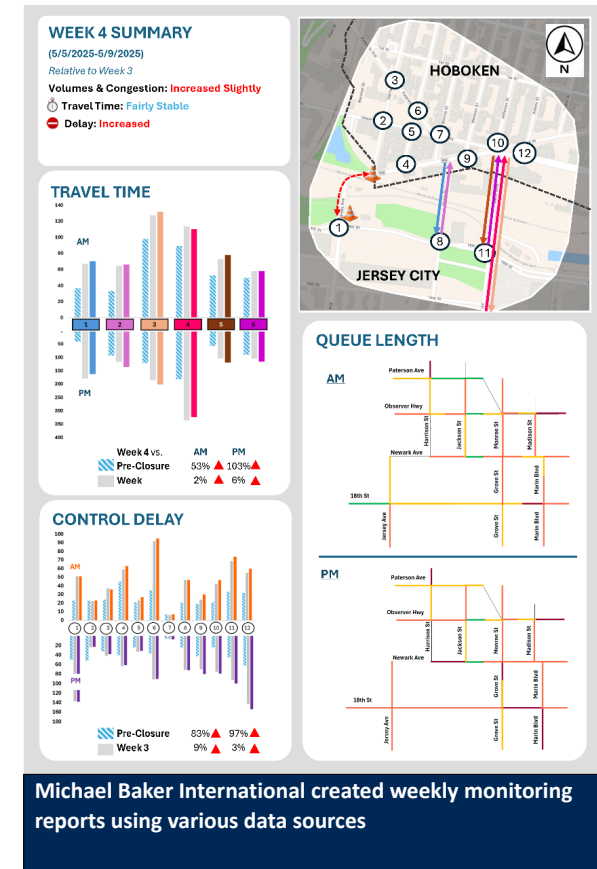
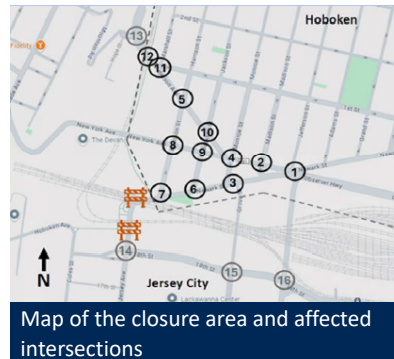
Project Benefits

- Advanced smart infrastructure using **real-time analytics**
- Leveraged **real-time data** during construction to validate operations and implement necessary adjustments
- Demonstrated inter-agency collaboration and **data-driven decision-making**



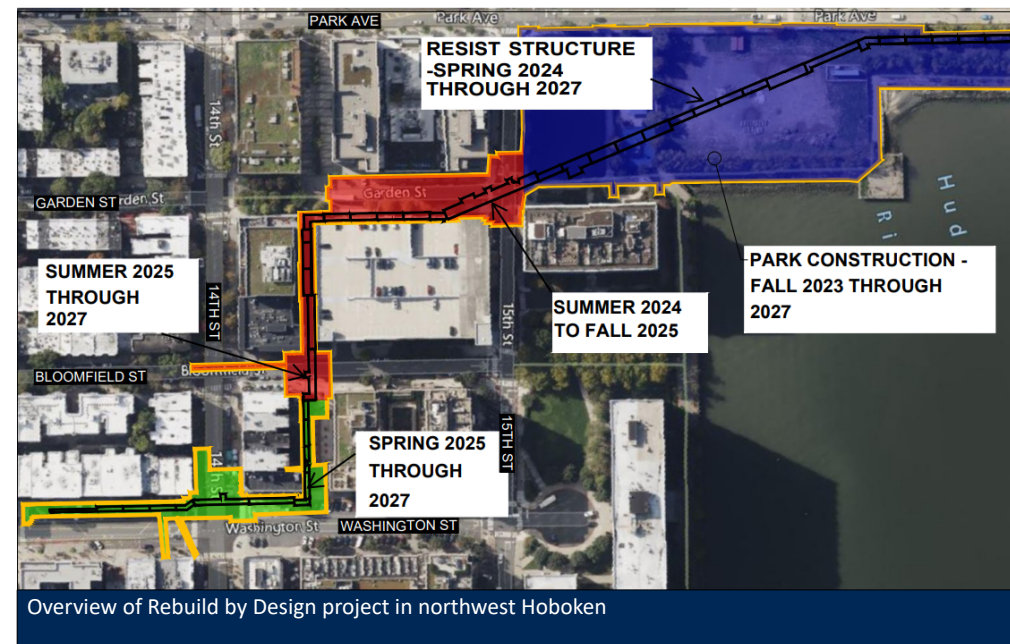
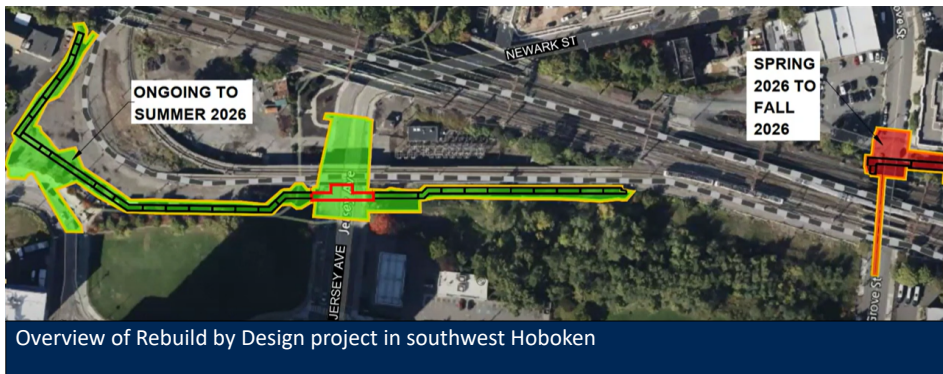
Uniqueness and Innovation

- **Unified** multiple jurisdictions under a single strategy (*Hoboken, Hudson County, Jersey City, Port Authority*)
- **Leveraged** real-time data, AI, video analytics, and conflict analysis
- **Supported** dynamic signal adjustments and multimodal monitoring
- **Dashboards** ensured transparency and engagement



Next Phases

- Northwest Hoboken Construction Closures through 2026
- Continuing to use Flow Labs historical and real-time traffic data
- Before /after mitigation comparisons
- Timing optimization at various intersections



THANK YOU

Learn more at:

flowlabs.ai

mbakerintl.com

hobokennj.gov/resources/rebuild-by-design

