



SNOW OPERATIONS: NEW APPROACH

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Game-Changing Initiatives for Solid Waste
The Cooper Union
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SNOW OPERATIONS

The Department of Sanitation keeps New York City healthy, safe and clean by collecting, recycling and disposing waste, cleaning streets and vacant lots, and clearing ice and snow. Clearing snow and ice from more than 19,000 lane-miles of roadways promptly, reliably and equitably is critical to our mission.

Winter conditions on the City's roadways introduce potential hazards to all forms of travel. Snow, ice, and other winter weather can impede first responders, temporarily close businesses and schools, and restrict the mobility of all New Yorkers. Snowfall can be expected to lead to the disruption of normal traffic patterns and public transportation. In prolonged or severe snowfall disruptions can last for extended periods of time.

DSNY makes every reasonable effort to clear snow and ice from the City's highways and streets quickly and effectively. This can be a lengthy process, particularly when persistent or heavy snowfall occurs with falling temperatures and high winds.

FOR SNOW RESPONSE

and preparation for winter operations. From weather forecast monitoring, inventory control, equipment maintenance, the Department focuses on the need

average snowfall of 25 to 30 inches responds to an average of 15 events each season. However, due to the last three seasons, the Department average of 24 separate events.

One of the most challenging aspects to storm response is the dependence on forecasting and its impact on strategic planning. The timing of an event and accumulation rates are critical – and difficult to accurately predict.

SNOW EQUIPMENT

- Variety of equipment includes collection trucks and equipment from Lot Cleaning and Solid Waste Management
- Other City Agencies provide an additional 135 plows and operators
- Reallocate personnel between districts/boroughs for adequate staffing

	Salt Spreaders	Haulsters	Plowable Trucks	Snow Front End Loaders	Skid Steers	Melters	TOTAL	% of Total Equipment
Manhattan	57	12	376	37	11	10	503	16%
Brooklyn	87	20	705	67	15	9	903	29%
Bronx	72	10	293	41	9	5	430	14%
Queens	150	18	712	62	12	8	962	31%
Staten Island	58	16	214	29	3	4	324	10%
Citywide	424	76	2,300	236	50	36	3,122	100%

DUAL ROLES = COMPETING GOALS

We continually strive to meet our core objectives of safety, service and sustainability.

- Our versatile fleet and a nimble workforce can be redirected quickly, moving from cleaning, collection, recycling, waste disposal and enforcement functions into snow operations.
- The preceding slide shows the vehicle fleet utilized during a storm response. 70% of the snow-fighting fleet is comprised of refuse and recycling collection trucks.
- Our goal is to keep the streets safe and passable for residents and visitors during winter weather events. Once we have achieved our public safety mission, the Department's workforce is reassigned to maintain our public health responsibilities and provide refuse and recycling collections as well as street cleaning. The Department issues press releases in advance and throughout storms and engages with local media throughout snow and extreme weather events.

MANAGING INFORMATION

One of DSNY's greatest strengths is our commitment to situational awareness and our ability to evaluate and adjust our plan accordingly.

- We track snow response progress via GPS units installed on all snow-fleet vehicles.
- All vehicles are equipped with two-way communication devices so that plow and spreader operators can communicate with both field supervisors and Headquarters.
- Condition reports and temperatures are called in from weather stations and field personnel continually.
- The public can track our storm response progress on the PlowNYC website.

SITUATIONAL AWARENESS

GPS Command Center

- Monitor PlowNYC & internal AVL system to report problem areas
- Monitor equipment, rapid response, and 311 snow complaints

NYC Emergency Management - Emergency Operations Center (EOC)

- DSNY representative reports to the NYCEM EOC:
 - Facilitates requests for assistance to and from other city agencies
 - Provides updates regarding snow removal operations
 - Attends update meetings in the EOC.

NYPD Command Center and DOT Cameras

- DSNY representative at the NYPD Command Center monitors cameras and relays information to DSNY GPS Command Center.

Field Monitoring and Support

- Officers call in field observations via radio and give continual guidance to spreader operators and updates to their respective borough command.

MANAGING EXPECTATIONS

No storm is the same. No response is the same.

The impact of a winter weather event is widespread and is compounded by nuances such as:

- Accumulations
- Event timing
- Duration of active snow fall
- Temperatures leading into the storm
- Temperatures following the storm
- Forecast and potential for immediate, subsequent events

These are fluid and subject to change despite the best efforts of forecasters.

Communication is key; informing residents on storm response and the status of collection operations is critical.

EVOLVING EXPECTATIONS

Public expectations continue to rise. The growing use of social media and personal smart technologies have had a profound impact on our operations.

We increase our situational awareness by encouraging public feedback. We treat the information provided as a tool to help us assess the effectiveness of our operation.

In the ever-changing landscape of public demand, the bar continues to rise. The public now has the ability to voice their concerns and opinions instantly and will certainly continue to do so.

We continue to adapt to the growing demands of the public and strive to provide the best possible service.

CASCADING IMPACTS OF SNOW STORMS

While difficult to quantify, snow can have significant impacts in the form of:

- Travel and Transit Delays or Disruptions
- School Closures (or Schedule Augmentations)
- Parental / Childcare Issues
- Business Closures
- Supply Line Disruptions
- Lost Revenue and Wages
- Along with many more....

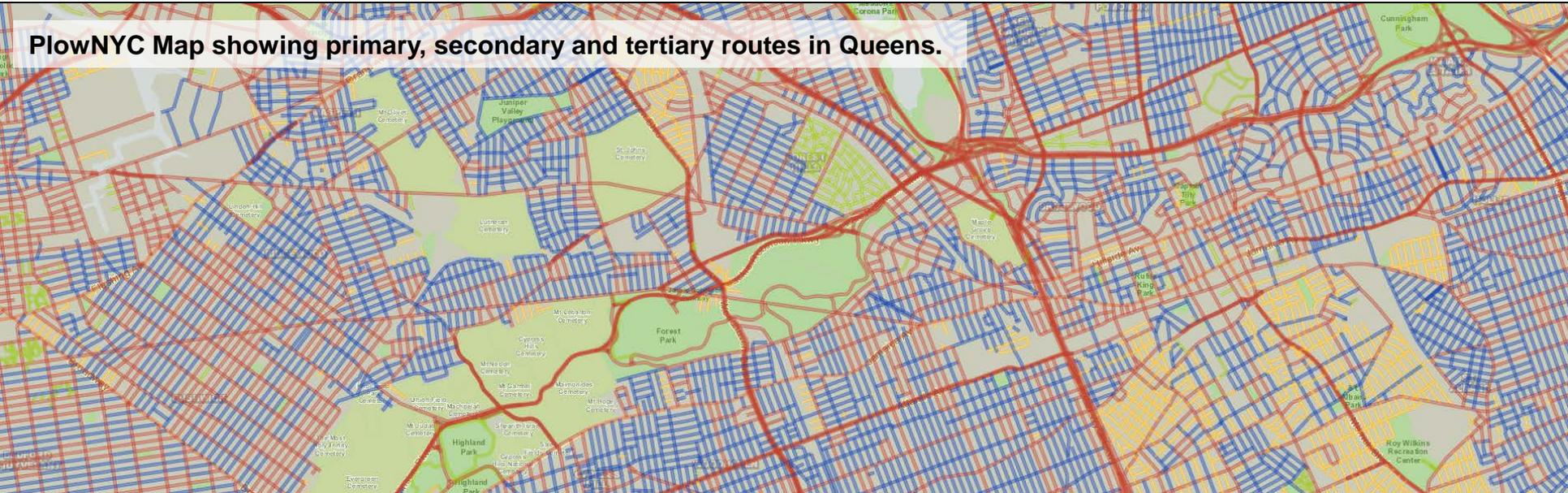
Studies indicate that the economic impact of a major snow storm shutting down roads in NY State for a single day would be in the hundreds of millions of dollars in direct and indirect costs. This is why DSNY is committed to exploring new technologies and new methodologies to achieve our goals.

TRADITIONAL SNOW ROUTING

Primary – Secondary – Tertiary Routing

- Streets categorized as primary, secondary and tertiary routes, based on traffic patterns, locations of critical public facilities, etc.
- Routes are designed as a systematic response targeting streets based on their classification
- DSNY moves through all route schedules as conditions permit
- Routes are designed to be completed in two hours from the respective start time of each route

PlowNYC Map showing primary, secondary and tertiary routes in Queens.

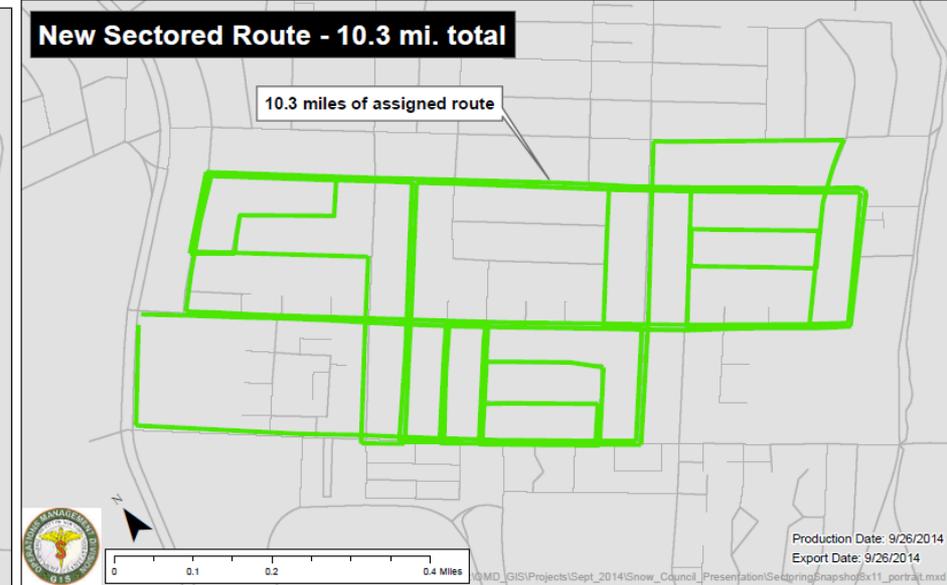
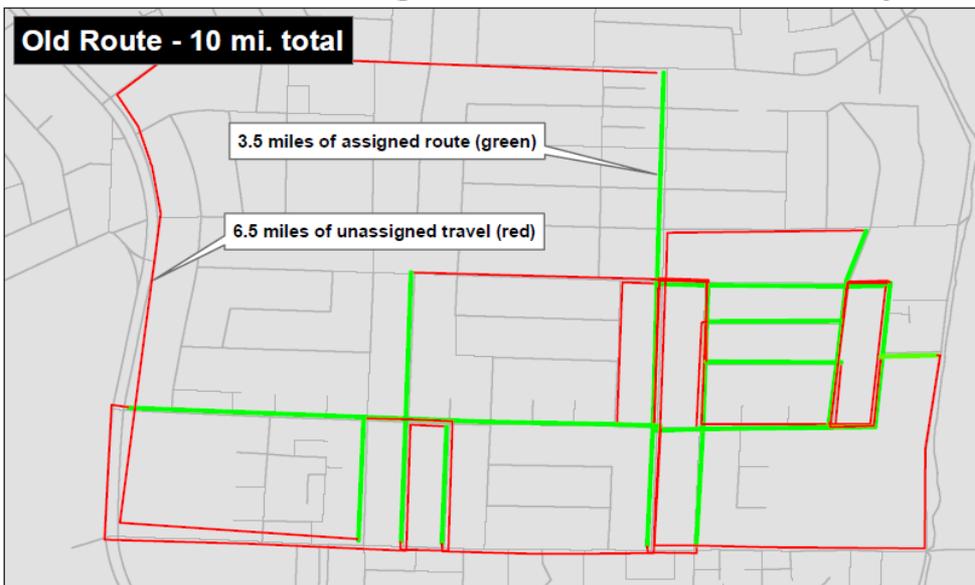


SNOW SECTORING

Snow Sectoring Routing Initiative – Pilot for 2014/2015

- Eliminated differentiation between Secondary and Tertiary streets.
- Achieved efficiency by removing redundant travel mileage
- Routes designed to be completed in two hours and will cover more ground with less overlapping mileage
- Dead-end streets and other roads requiring specialized equipment are covered by Haulsters

SI02 Snow Sectoring Route Enhancements Sample



WHAT IS SECTORING

Snow priority designations changed to two new types of designations: Critical Routes and Sector Routes

Critical Routes are 17-20 miles long and are comprised of:

- Highways
- Bus Routes
- Streets with Emergency Facilities (Police precincts, Fire houses, hospitals, nursing homes) and other main thoroughfares.

Sectors encompass all streets that are not classified as Critical Streets (Combining Secondary & Tertiary) and:

- Give snow equipment a concentrated work area with minimal/no dead heading within or between routes.
- Encompass a maximum of 9 roadway miles. This mileage constraint helps ensure that each sector is fully serviced in two hours or less (assuming a driving speed of 5 MPH)

SECTORING IS A GAME CHANGER

- All streets are serviced simultaneously by a spreader or plow.
- When Sectoring is implemented Citywide, equipment distribution will compensate for area coverage and obstacles such as traffic patterns, narrow streets, miles to complete, and highway coverage.
- Improved supervision and reaction time to changing priorities/needs when coupled with the GPS systems.
- Improved clarity of progress with PlowNYC and Blade Runner.
- New Yorkers can view PlowNYC at **maps.nyc.gov/snow** to find out their street designation (primary, secondary or tertiary) and the last time a DSNY salt spreader or plow worked there.
- Vehicle operators now have printed turn-by-turn directions and maps of their assigned sector.

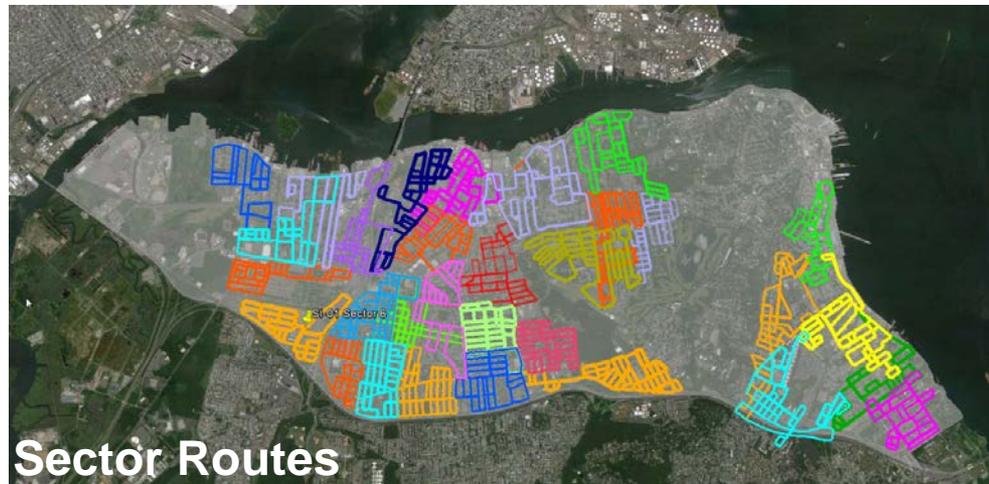
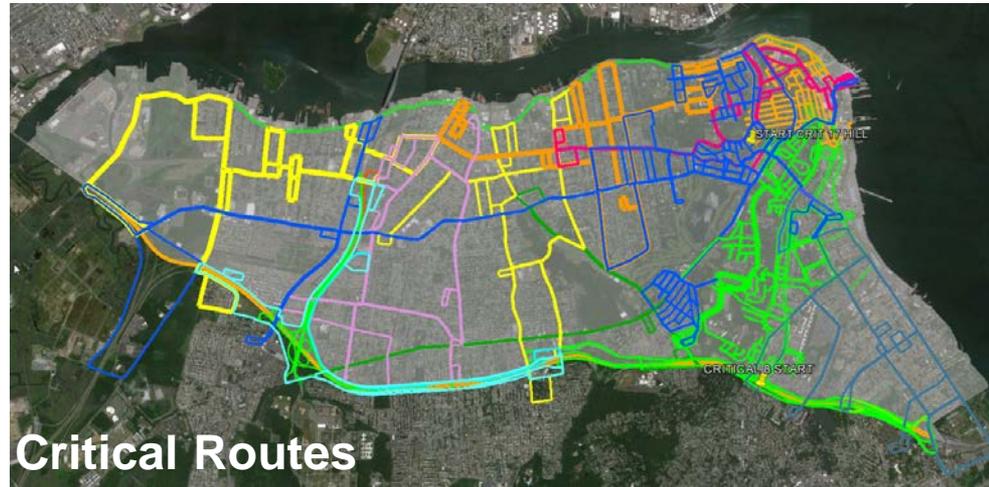
SNOW ROUTES – SECTORING EXAMPLE

Staten Island CB1

Critical routes include highways and major thoroughfares, plus:

- Schools
- Hospitals
- Firehouses
- Police precincts
- Ambulance depots

Sector routes are compact and continuous, minimizing overlap. Sectoring created efficiencies equivalent to adding 10 more spreaders on Staten Island



BENEFITS OF SECTORING

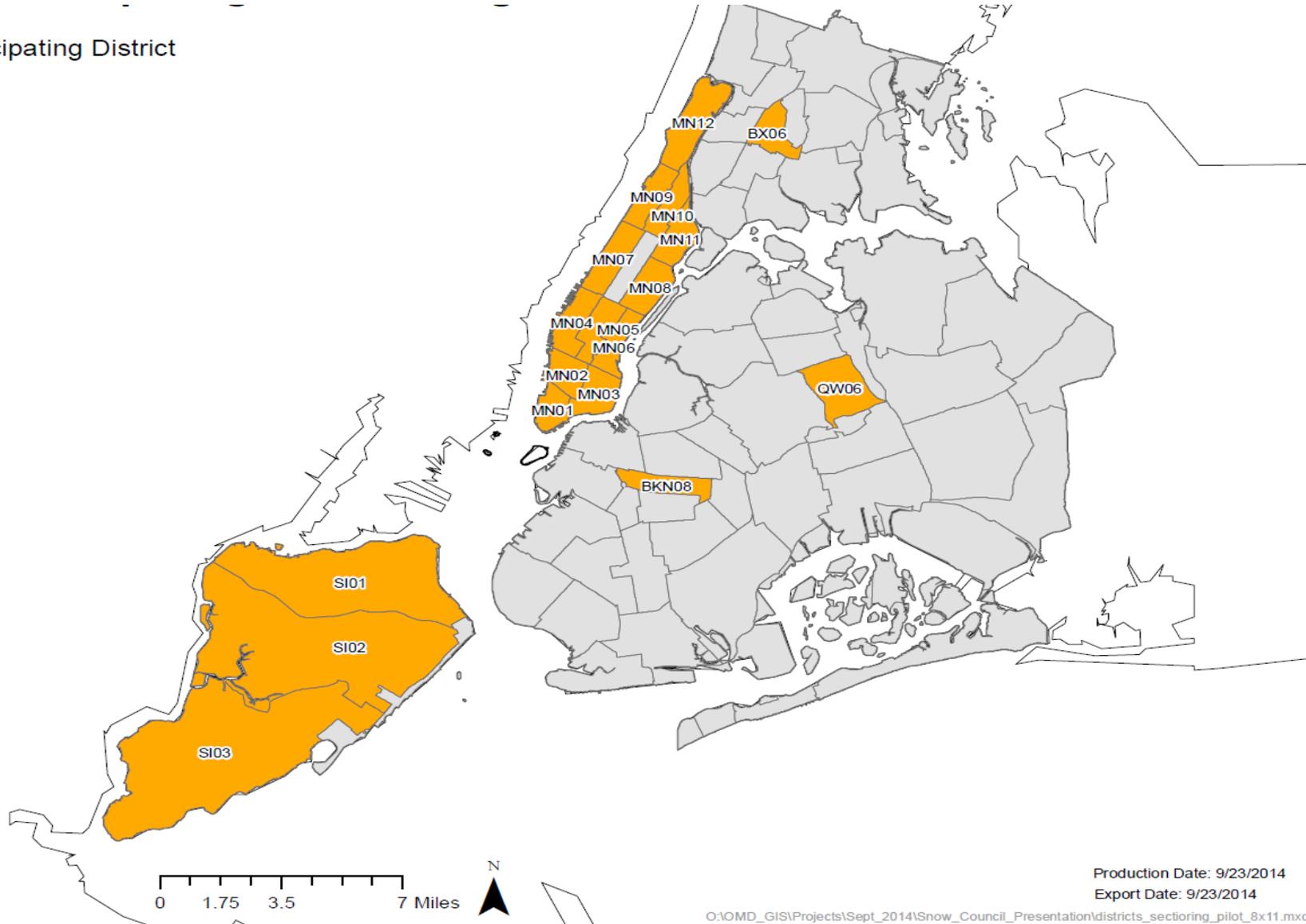
- Significantly decreases time needed to complete all schedules. Districts are serviced faster than traditional routes.
- Balances personnel and equipment so that all areas of the City can receive improved and equitable service
- Easy to supervise snow operations:
 1. Executive staff and field personnel can monitor Citywide, Borough and District snow removal progress via RAStrac and BladeRunner because sectors have been incorporated into both GPS reporting systems. The routes are designed to address concentrated areas, so the user can more easily identify problem areas and progress.
 2. Routes are designed as sectors so supervisors can see – in real time – if operators are servicing their route and hold operators accountable and take corrective action, if necessary.

BENEFITS OF SECTORING CONTINUED

- Officers can more efficiently assign equipment to routes requiring service because they can use GPS to identify completion and are equipped with a clear visual representation of routes requiring service.
- Easier to redirect or redistribute equipment at role call and if equipment goes out of service and requires replacement.
- Easier to identify a route that has not been serviced.
- Minimizes the potential for 311 snow and ice complaints because all schedules are assigned simultaneously.
- May eliminate the need for private tertiary contract because all schedules are assigned simultaneously.

SECTORING PILOT: PARTICIPATING DISTRICTS

 Participating District



Production Date: 9/23/2014
Export Date: 9/23/2014



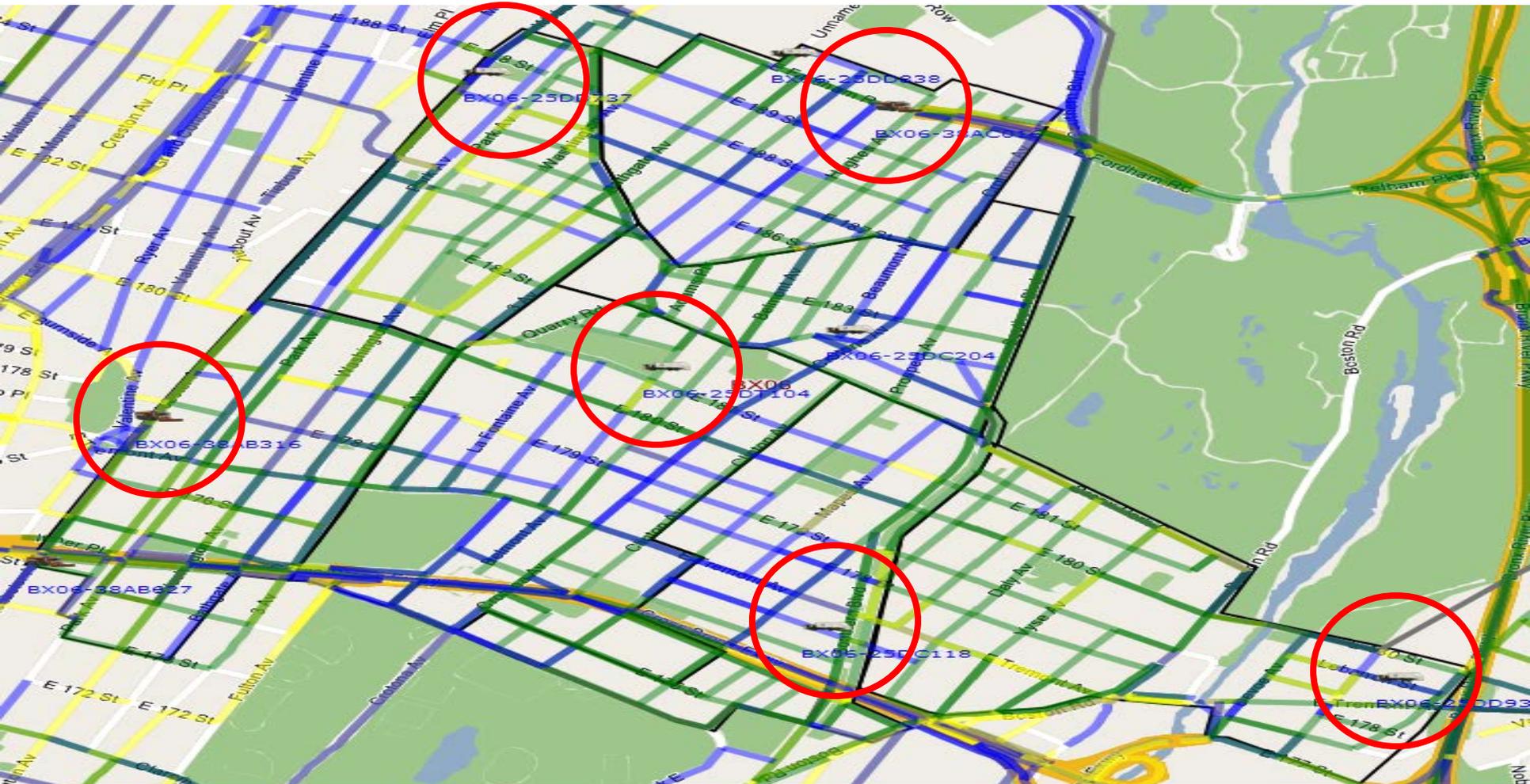
OTHER BENEFITS: NON-SNOW FUNCTIONS

Sector routes can be used when the Department is engaged in cleaning efforts and other emergency situations, such as the debris removal and street access recovery operations in Super Storm Sandy response.

- Service requests from 311 and from other City agencies can be clustered by sector, possibly shortening response time.
- Debris clean up can be assigned by sector. This could simplify and evenly distribute service over multiple affected areas. Ease of routing for emergencies. Promotes use of a predetermined and consistent strategy locally, eliminating the need for last-minute routing.

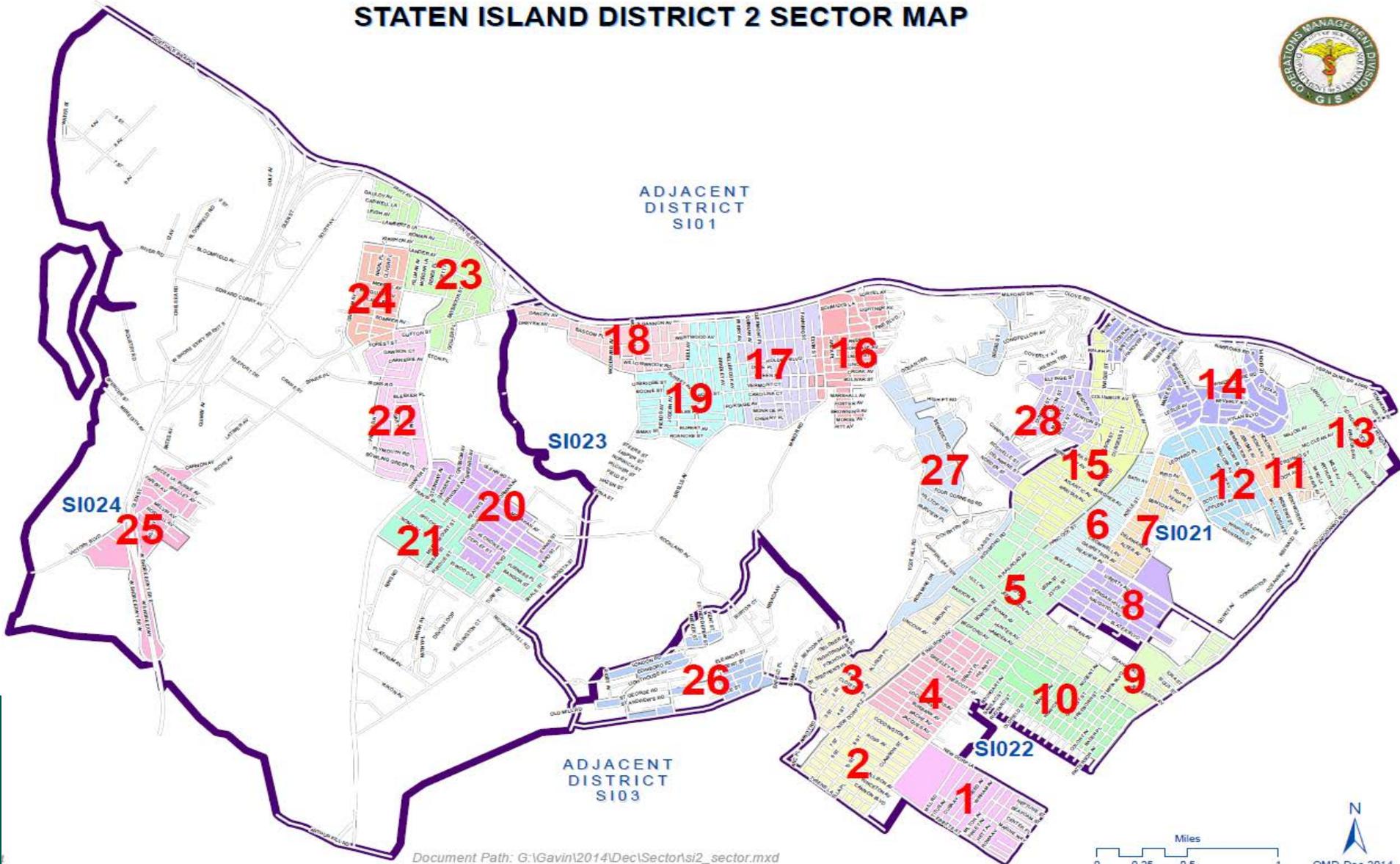
SECTOR ROUTE FINDINGS

Equipment is servicing several areas simultaneously. Sector routing prioritizes the distribution of snow removal equipment throughout the District as a whole promoting equitable service throughout.



EXAMPLE OF SECTORED DISTRICT MAP

STATEN ISLAND DISTRICT 2 SECTOR MAP



CLOSING

The NYC Department of Sanitation is committed to serving the residents of our City and keeping the roads safe and passable during winter storms.

We explore new ideas and initiatives throughout our vast scope of responsibilities, continually evaluating our operation and exploring new methods and technology to achieve our goals.

The Sectoring Initiative is truly a game changer, and coupled with the Department's continued commitment to invest in new technology and fleet upgrades, we can meet our core mission.

THANK YOU

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