


Memorandum



Date: May 24, 2023

To: Honorable Chairman Oliver Gilbert, III
and Members, Board of County Commissioners

From: Daniella Levine Cava
Mayor 

Subject: Report Surveying Countywide Damaged, Broken or Otherwise Inoperative Inductive-Loop Traffic Detectors – Directive No. 230074

Executive Summary

This report, prepared by the Department of Transportation and Public Works (DTPW), is being provided to the Board of County Commissioners (Board) in response to Resolution No. R-221-23 which was adopted on March 7, 2023. The resolution was sponsored by Commissioner Micky Steinberg and directed the Administration to prepare a report on countywide damaged, broken, or inoperative inductive loop traffic detectors (traffic loops). Inductive loops are referred to as presence detectors, and in traffic detection are often used in combination with axle sensors to collect classification data such as speed and length.

DTPW currently oversees the operations and maintenance of 3,124 traffic signals countywide with a small, in-house crew. Proper signal operation and corridor progression depends on a healthy detection system (loops, cameras, microwave detectors, and others). There are 12,496 loops in Miami-Dade County, of which 1388 are damaged or inoperable. While this only accounts for 11% of total loops, this impacts 22% of intersections countywide. However, the health of detection loops does not have a detrimental effect on the safety of an intersection as where a loop is inoperable the signal reverts to pre-timed functionality, overserving the side street, i.e., assigns additional green time to the side street without a vehicle being present.

The current crew repairs between 10 to 15 loops per week. In the past, DTPW relied on contractor services to supplement in-house staff to repair faulty loops. In 2018, at the request of then-Miami Beach Commissioner Micky Steinberg, DTPW capitalized on contracted services to reduce faulty loops in Miami Beach by almost 90% in 120 days. Due to departmental funding impacts, these contracts are no longer available. As a result, the loop-repair crew productivity is only sufficient to keep the number of faulty loops from increasing, not decrease the number of faulty loops. The cost for loop repair is an ongoing challenge as the cost of materials continues to increase, with current prices being bid between \$1,500 to \$2,000 per loop.

DTPW is currently in the implementation phase of the Advanced Transportation Management Systems (ATMS) project. The project consists of upgrading traffic signal hardware and software to enhance system capabilities and flexibility. The scope of the project includes the replacement of the majority of traffic loops by modern camera systems. While this may introduce specialized maintenance needs, it is expected to greatly reduce the number of loops damaged by construction and roadway maintenance. DTPW will continue to seek additional funding to address traffic loop repairs for districts in the latter implementation years, concurrent with the initial phase of implementation of new detection systems as part of the ATMS project in commission districts.

Background

The Traffic Signals and Signs Division of DTPW is responsible for all traffic signal operations and maintenance in Miami-Dade County. There are currently 3,124 traffic signals throughout the County. One integral part of the infrastructure is the detection system which is responsible for emitting the signal to the controller to activate the green light for a particular movement. The detection system in Miami-Dade County mainly consists of induction loops (traffic loops); however, it also includes detection cameras, microwave detection and others.

The health of traffic loops is affected by various factors. The highest contributing factor to loop operability is construction and maintenance projects (both public and private) that damage loops. It is worth highlighting that DTPW greatly reduced faulty loops as of four years ago using contractor services; however, the pandemic, material shortages, funding availability, and staffing shortages have greatly affected internal productivity, reducing the timeliness of repair work.

Survey of Induction Loop Traffic Detectors

The data below presents the status of induction loops in District 4 and then the balance of loops, countywide. The attachment to the report provides a district specific breakdown.

District 4

- Total number of signals – 251 signals
- Total loops (assuming 4 loops per intersection) – 1004 loops
- Total faulty loop locations – 45
- Percent faulty loops – 9%
- Percent of intersections affected by faulty loops – 18%

Countywide

- Total number of signals – 3,124 signals
- Total loops (assuming 4 loops per intersection) – 12,496 loops
- Total faulty loop locations – 694
- Percent faulty loops – 11%
- Percent of intersections affected by faulty loops – 22%

The current in-house loop crew repairs between 10 to 15 loops per week. In the past, DTPW relied on contractor services to supplement in-house staff to repair faulty loops. In 2018, at the request of then-Miami Beach Commissioner Micky Steinberg, DTPW capitalized on contracted services to reduce faulty loops in Miami Beach by almost 90% in 120 days. Given challenges in funding, these contracts are no longer available, and as a result, the loop productivity is only sufficient to keep the net additional faulty loops to zero.

Historically, funding to supplement in-house loop replacement was allocated from Charter County Transportation Surtax funds. Funding availability reductions in 2009 resulted in transportation surtax funds being applied to only support two in-house crews, and there has not been a contract for loop repairs in 15 years. It is also important to note that transportation surtax revenues are now ineligible to fund loops repairs – both in-house and outsourced – due to the recent enactment of House Bill 385/Senate Bill 898, greatly curtailing the application of such revenues to public works projects. To supplement the in-house crew to address the backlog of damaged loops, a funding allocation of approximately \$400,000 (based on the quantity of repair work required multiplied by the estimated cost per loop) would be needed over the next four years.

DTPW is currently in the implementation phase of the ATMS project. The project consists of upgrading traffic signal hardware and software to enhance system capabilities and flexibility. The project scope includes replacement of existing signal controllers (over 20 years of age) to the newer 2070 Siemens controllers, having capabilities for advanced analytics, data collection, and support of connected/autonomous vehicles. One of the principal activities of the project is the replacement of the majority of the loop detection system by state-of-the-art camera and microwave detection. While this introduces other specialized maintenance, it is expected to greatly reduce the number of loops damaged by construction, resurfacing, and maintenance projects, thus improving overall health of the system long-term. Approximately 92% of all detection in District 4 is scheduled to be upgraded in 2023 while the remaining 8% is scheduled for 2026.

Although deployment of the ATMS project has already commenced in District 4, other districts are scheduled as late as 2026 and 2027 for the phased implementation. In order for DTPW to address the outer years more expeditiously, contracts would need to be secured subject to funding availability to enhance the current in-house repair demands. DTPW continues to explore funding options to supplement staffing to promote a quicker response to loop repair work.

Pursuant to Ordinance No. 14-65, this report will be placed on the next available Board meeting agenda. Should you require additional information, please contact Eulois Cleckley, DTPW Director and CEO at (786) 469-5406.

Attachment

- c: Geri Bonzon-Keenan, County Attorney
- Gerald Sanchez, First Assistant County Attorney
- Jess McCarty, Executive Assistant County Attorney
- Office of the Mayor Senior Staff
- Yinka Majekodunmi, Commission Auditor
- Jennifer Moon, Chief, Office of Policy and Budgetary Affairs
- Basia Pruna, Director, Clerk of the Board
- Eugene Love, Agenda Coordinator
- Josiel Ferrer-Diaz, P.E., Deputy Director, DTPW

District	Total Number of Signals	Total Loops*	Total Faulty Loop Locations	Total Faulty Loops (Approx)**	Faulty Loop Percentage	Percent of Intersections affected
1	175	700	68	136	19%	39%
2	239	956	68	136	14%	28%
3	360	1440	80	160	11%	22%
4	251	1004	45	90	9%	18%
5	384	1536	52	104	7%	14%
6	259	1036	62	124	12%	24%
7	303	1212	42	84	7%	14%
8	220	880	39	78	9%	18%
9	170	680	31	62	9%	18%
10	168	672	38	76	11%	23%
11	125	500	22	44	9%	18%
12	301	1204	102	204	17%	34%
13	162	648	45	90	14%	28%

<i>Countywide Statistics</i>	
Total Signals	3124
Total Loops	12496
Total Faulty Loop Locations	694
Total Faulty Loops	1388
Percent of faulty loops	11%
Percentage of intersections affected	22%

* Based on an assumed 4 loops per intersection

**Based on a review of 500 Open Work Orders, an average of 2 faulty loops per reported location was found