

# New York City Department of Transportation

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## Oversight of Selected Aspects of Traffic Controls

Report 2018-N-6 | September 2020

OFFICE OF THE NEW YORK STATE COMPTROLLER

Thomas P. DiNapoli, State Comptroller

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Division of State Government Accountability



# Audit Highlights

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## Objectives

To determine whether the New York City Department of Transportation (Department) is monitoring and evaluating traffic flow at intersections and whether the Department took action to improve safe traffic and pedestrian flow at intersections. The audit covers January 1, 2016 to March 13, 2020.

## About the Program

The Department is responsible for providing safe and efficient movement of pedestrians, goods, and vehicular traffic on the streets, highways, bridges, and waterways of New York City's transportation network.

The Signals & Street Lighting unit is part of the Traffic Operations Division (Division), and comprises, among other units, the Intersection Control Unit (ICU), responsible for conducting traffic control studies at intersections without traffic signals. The federal Manual on Uniform Traffic Control Devices (MUTCD) contains standards and recommended guidance for traffic control devices, including the need for studies and factors for justifying the installation of traffic signals and multi-way stop controls. Studies that result in denials may be referred to another Department unit for additional safety measures to be considered.

The ICU also evaluates the condition of existing traffic controls (e.g., pavement markings, signs) at intersections and notes necessary improvements that are referred to other units for review. Contractors are required to install approved traffic signals within 45 days of receiving the work order. The Division also initiates reviews referred to as proactive studies where it determines there is a need to evaluate an intersection. The Enhanced Intersection Unit (EIU) is one of the groups that receive referrals, and is responsible for re-examining safety measures at intersections, such as additional signage markings and improvements.

The Traffic Management Center (TMC), also part of the Division, operates 24/7 and is responsible for citywide traffic management, incident response, traffic signal operation and maintenance, and information dissemination. The Department coordinates incident response with its Office of Emergency Response, the New York City Police Department, and the New York State Department of Transportation, in the Joint Transportation Management Center.

Midtown in Motion, a congestion management system used by the TMC, is used to improve traffic conditions in midtown Manhattan by identifying traffic issues and automatically adjusting signal patterns to smooth traffic flow.

## Key Findings

The Department monitored traffic flow at intersections, but did not address the concerns of its customers in a timely manner. We reviewed several units that were supposed to perform monitoring and operational tasks and found that all of them need to improve their performance. Specifically, we found the following:

- Our review of 78 intersection studies found it took the ICU an average of ten months (41 weeks) to complete a study – well beyond the four-month time frame specified in the Department's Resource Guide. In fact, 34 studies took more than one year to complete.

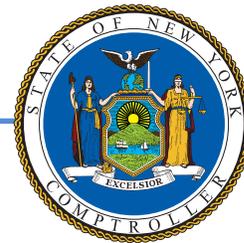
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- We visited 17 intersections where the ICU recommended improvements and found six improvements that were not implemented and no evidence of the decisions made regarding the recommended improvements.
  - The Department did not provide any documentation that the EIU took action to determine if safety measures should be implemented at 5 of the 25 sampled locations based on proactive studies sent by the ICU.
  - The ICU did not maintain adequate support for the results of 10 of the 25 proactive studies reviewed. For example, four of the five signal approvals that were based on a warrant<sup>1</sup> requiring automated eight-hour traffic counts did not contain the traffic counts or an explanation why the eight-hour counts were not conducted.
  - The TMC did not always monitor traffic conditions due to traffic cameras that were pending repair for significant amounts of time, including 35 traffic cameras that were out of service for over 180 days, with two traffic cameras out of service for over five years.

## Key Recommendations

- Revise the Department's Resource Guide to make meeting the time frames a requirement.
- Develop a process for the ICU to ensure that improvements recommended by its inspectors are implemented promptly. Document the reasons recommendations were not implemented or were modified.
- Ensure the EIU reviews cases from the ICU and documents the results regarding any safety improvements that can be made to an intersection.
- Ensure that intersection study files contain all required documentation, including, but not limited to, information supporting the conclusions in accordance with the MUTCD.
- Develop procedures regarding the camera repair process and update the Electrical Shop Standard Operating Procedures.

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<sup>1</sup> Justification includes meeting at least one of the threshold conditions (warrants) that, if found to be satisfied as part of an engineering study, shall result in analysis of other traffic conditions or factors to determine whether a traffic control device or other improvement is justified.



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## Office of the New York State Comptroller Division of State Government Accountability

September 30, 2020

Ms. Polly Trottenberg  
Commissioner  
New York City Department of Transportation  
55 Water Street  
New York, NY 10041

Dear Commissioner Trottenberg:

The Office of the State Comptroller is committed to helping State agencies, public authorities, and local government agencies manage their resources efficiently and effectively. By so doing, it provides accountability for tax dollars spent to support government-funded services and operations. The Comptroller oversees the fiscal affairs of State agencies, public authorities, and local government agencies, as well as their compliance with relevant statutes and their observance of good business practices. This fiscal oversight is accomplished, in part, through our audits, which identify opportunities for improving operations. Audits can also identify strategies for reducing costs and strengthening controls that are intended to safeguard assets.

Following is a report of our audit of the New York City Department of Transportation entitled *Oversight of Selected Aspects of Traffic Controls*. This audit was performed pursuant to the State Comptroller's authority as set forth in Article V, Section 1 of the State Constitution and Article III, Section 33 of the General Municipal Law.

This audit's results and recommendations are resources for you to use in effectively managing your operations and in meeting the expectations of taxpayers. If you have any questions about this report, please feel free to contact us.

Respectfully submitted,

*Division of State Government Accountability*

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# Glossary of Terms

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<b>Term</b>	<b>Description</b>	<b>Identifier</b>
ARTS	Agency Response Tracking System	<i>System</i>
ATR	Automatic Traffic Recorder	<i>Key Term</i>
CCU	Commissioner's Correspondence Unit	<i>Unit</i>
City	New York City	<i>Key Term</i>
Department	New York City Department of Transportation	<i>Auditee</i>
Division	Traffic Operations Division	<i>Unit</i>
EIU	Enhanced Intersection Unit	<i>Unit</i>
ICU	Intersection Control Unit	<i>Unit</i>
JTMC	Joint Transportation Management Center	<i>Unit</i>
MiM	Midtown in Motion	<i>System</i>
MUTCD	Manual on Uniform Traffic Control Devices	<i>Key Term</i>
NYPD	New York Police Department	<i>Agency</i>
Resource Guide	Department's Resource Guide	<i>Key Term</i>
RIS	Research, Implementation and Safety unit	<i>Unit</i>
SOPs	Standard Operating Procedures	<i>Key Term</i>
STU	Signal Timing Unit	<i>Unit</i>
SWOTS	Signal Work Order Tracking System	<i>System</i>
TMC	Traffic Management Center	<i>Unit</i>
TPM	Division of Transportation Planning and Management	<i>Unit</i>
VMS	Variable Message Signs	<i>Key Term</i>

# Background

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The New York City Department of Transportation (Department) is responsible for providing safe and efficient movement of pedestrians, goods, and vehicular traffic on the streets, highways, bridges, and waterways of New York City's (City) transportation network. The Department is responsible for the operation and condition of approximately 6,300 miles of streets and over 13,100 signalized intersections.

The Traffic Operations Division (Division) is responsible for conducting traffic control studies at intersections, approving traffic controls (including traffic signals and multi-way stops), and overseeing the design, construction, timing, and maintenance of traffic control devices. The Signals & Street Lighting unit is part of the Division and includes the Intersection Control Unit (ICU), responsible for conducting traffic control studies at intersections without traffic signals, and the Signal Timing Unit (STU), responsible for conducting studies at intersections with signals. The Department receives intersection study requests from various sources, including the City's 311 system, its website, letters from the public, elected officials, and Department employees. The Research, Implementation and Safety (RIS) unit, within the Division of Transportation Planning and Management (TPM), develops data-driven lists of non-signalized intersections to be studied by the ICU as a proactive initiative.

The Division's Traffic Management Center (TMC) is a 24/7 operation responsible for citywide traffic management, incident response, traffic signal operation and maintenance, and information dissemination. To monitor traffic conditions and detect incidents, TMC staff use video surveillance cameras, vehicle detectors, and media broadcasts. The Department is part of the Joint Transportation Management Center (JTMC), which coordinates incident response with its Office of Emergency Response, the New York City Police Department (NYPD), and the New York State Department of Transportation.

In 2011, the TMC began using the Midtown in Motion (MiM) system to improve traffic conditions in midtown Manhattan by identifying traffic issues and automatically adjusting signal patterns to smooth traffic flow. According to Department officials, MiM manages over 500 signalized intersections utilizing 160 microwave sensors,<sup>2</sup> 50 traffic video cameras, and 100 E-ZPass readers.

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<sup>2</sup> Microwave sensors are readers located at intersections to detect and count vehicles.

# Audit Findings and Recommendations

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We concluded that, while the Department monitored traffic flow at intersections, it did not address the concerns of its customers about traffic at intersections in a timely manner. The ICU consistently did not complete cases assigned to it within the expected time frames. Our review of 78 requests for intersection studies showed that it took an average of ten months to process the requests within the ICU instead of the four months specified in the Department's Resource Guide (Resource Guide). While the ICU has reduced the time to process studies opened in 2018 or later, it was still taking an average of seven months to complete reviews. In addition, several of the study files did not include complete documentation to support intersection study conclusions. In four of six cases where signal-related work was released to the contractor, the traffic control device was not installed within 45 days, as required.

Moreover, the Department did not provide support to show that recommended improvements (e.g., pavement markings and signs) made by the ICU were reviewed and/or implemented by the unit they were referred to.

The Division also initiates reviews referred to as proactive studies where it determines there was a need to evaluate an intersection. However, 10 of the 25 studies we reviewed did not contain information to support the conclusions, such as signal or multi-way stop sign approvals or signal request denials.

We also found that the Department's monitoring of traffic is hampered due to traffic cameras that remain unrepaired for long periods of time and an incomplete traffic incident log. Out of 35 cameras requiring repairs that were outstanding for over six months, we found 24 had tickets that were open over 12 months, including two pending repair for over five years. In addition, TMC's incident log, which documents traffic incidents that affect City motorists, did not always contain required information, such as actions the TMC took when an incident was reported (e.g., notifying other agencies, activating Variable Message Signs [VMS],<sup>3</sup> changing signal timing).

To improve traffic conditions in midtown Manhattan, the Department utilizes the MiM system to identify traffic issues and automatically adjust signal patterns to smooth traffic flow. TMC operators can override the proposed changes; however, TMC's Standard Operating Procedures (SOPs) did not include MiM or criteria for whether to accept or reject the change. Further, there are no training manuals. MiM is run on one dedicated computer terminal, which does not require an individual username and password to sign on, and all TMC staff share one user account and password.

## Intersection Control

The Manual on Uniform Traffic Control Devices (MUTCD) issued by the U.S. Department of Transportation, Federal Highway Administration, is the national standard for all traffic control devices installed on any street, highway, or private road open to public travel. It contains standards and recommended guidance regarding traffic control devices, including the need for studies and factors for justifying

<sup>3</sup> VMS are traffic control devices used to provide motorists with information about traffic congestion, accidents, maintenance operations, adverse weather conditions, roadway conditions, or organized events.

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the installation of traffic signals. Justification includes meeting at least one of the threshold conditions (warrants) that, if found to be satisfied as part of an engineering study, shall result in analysis of other traffic conditions or factors to determine whether a traffic control device or other improvement is justified. The fact that a warrant for a particular traffic control device is met is not conclusive justification for the installation of the device. Warrants include factors such as vehicular and pedestrian volume and the crash history at the location. In addition, the MUTCD contains criteria for multi-way stop controls.

The Commissioner's Correspondence Unit (CCU) processes incoming requests, including new traffic signals and stop signs, sends acknowledgment letters to requestors, researches which unit would be most appropriate to handle the request, and assigns requests to the appropriate unit. The CCU uses the Agency Response Tracking System (ARTS) to track all requests.

The ICU enters requests received from the CCU in the Signal Work Order Tracking System (SWOTS), and assigns them to an ICU inspector to conduct a preliminary intersection control analysis (i.e., fieldwork). If criteria for a signal or multi-way stop are met, a response letter is sent to the requestor with the results. A similar response process is in place if a study results in a denial. Exhibits A and B at the end of this report provide flowcharts of the CCU and ICU procedures for processing cases.

We reviewed a sample of 78 intersection studies to determine if the Department completed study requests in a timely manner, and in accordance with agency procedures and MUTCD guidelines.

## Intersection Studies

We determined that the Department is not resolving intersection study requests in a timely manner. Out of 78 intersection studies, 34 (44 percent) took more than one year for the Department to complete. Another ten cases (13 percent) took between 10 and 12 months to complete.

For example, a request was received on October 21, 2013 to address safety concerns for a traffic signal along Center Boulevard between 46th and 50th Avenues in Queens. The requester wrote that an increasing number of vehicles using the road were traveling at significant speeds. The case was sent to the ICU about a week after it was received; however, it was not entered into SWOTS until September 8, 2016 – almost three years later. A denial letter was sent to the requestor on December 28, 2017, over four years after the request was initially received by the Department. The location was re-evaluated on April 28, 2018, and a multi-way stop was approved on May 29, 2018 and installed on June 8, 2018.

Similar instances of slow responses to customers occurred, in part, because the Department does not have a required time frame for providing a customer with the final determination of an intersection study. Department officials told us that, while they do not have a time frame for completion of studies, the CCU sends a quarterly overdue case report to all operational units and a bi-weekly report is sent to all Borough

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Commissioners and the top operational units with high volumes of cases. They added that a system-generated email is sent to staff who have a case assigned to their unit without a change in status for more than 14 days. These reports were not in any of the case files reviewed, and the Department did not provide any monitoring reports.

The Resource Guide indicates the ICU has 16 weeks (four months) to complete studies for traffic signals and multi-way stop signs.

The ICU was involved with 70 of the 78 sampled cases that resulted in either an approved or denied request and consistently did not complete intersection studies within the Resource Guide time frames. Of the 70 cases, 63 (90 percent) were not completed by the ICU within the expected time frames. It took an average of three and a half months to enter a case in SWOTS, followed by another four months to assign the case to an inspector, and two and a half more months to complete the intersection analysis and submit it for a supervisory signoff. Thus, the total average time to complete a case study was ten months, well over the expected time frame of four months. The remaining eight cases were pending approval, forwarded to another unit, or canceled by the requester.

As part of the intersection studies, the ICU can recommend improvements to be implemented, such as additional signage, refurbishment of road markings, speed humps, and shorter distances for crosswalks. The recommendations are noted in the study documentation and sent to the appropriate unit.

We visited 17 intersections with recommended improvements and found six recommendations were not implemented. For example, an ICU inspector recommended refurbishments of stop bars, as well as “Stop” and “School Crossing” messages, at the intersection of Baisley Boulevard and Montauk Street in Queens. On November 7, 2019, we observed that only the letter “P” of the “Stop” pavement message was visible on the southern leg of Montauk Street (Image 1), and the “School Crossing” markings were significantly damaged on the southern leg of Montauk Street (Image 2), the eastern leg of Baisley Boulevard (Image 3), and the western leg of Baisley Boulevard (Image 4).



**Image 1** (facing north): Damaged “Stop” pavement marking on the southern leg of Montauk Street



**Image 2** (facing north): Damaged “School Crossing” pavement marking on the southern leg of Montauk Street



**Image 3** (*facing west*): Damaged “School Crossing” pavement marking on the eastern leg of Baisley Boulevard



**Image 4** (*facing east*): Damaged “School Crossing” pavement marking on the western leg of Baisley Boulevard

In contrast to the conditions observed during our visit, the following images illustrate how the markings should be visible and clear to motorists and pedestrians.



**Image 5**: “School Crossing” pavement marking, Cherokee Place and East 77th Street



**Image 6**: “Stop” pavement marking, Battery Place and 3rd Place



**Image 7**: “Crosswalk” pavement marking, 42nd Street and 48th Avenue, Queens

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We were advised that the decision to implement recommendations rests with the unit where the ICU information was sent; however, there was no evidence provided that supported any decisions made regarding these recommendations. ICU officials added that they do not monitor the recommendations sent to another unit. Thus, they do not have any assurance action was taken to address the conditions ICU inspectors identified at these intersections.

To determine if a warrant for a traffic control device is met, inspectors review data from NYPD's crash database. However, 10 of the 78 studies did not have a crash report in the file, and 2 of the 10 studies were denied without any evidence of a crash history review. In the absence of documentation, the Department lacks reasonable assurance that a warrant or other criteria was not met.

We concluded that the lengthy time to complete a study was due, in part, to the fact the ARTS and SWOTS systems were not integrated. As a result, ICU staff have to manually enter the requests into the SWOTS system before an inspector can be assigned. Further, management's monitoring of the actual time a case is open is lowered, because the SWOTS system allows users to modify dates. Similarly, the ARTS system allows ICU users to change the "Due Date" field, which could hinder the CCU's monitoring of how long a case has been open.

According to Department officials, the delays were due to a backlog of cases, which significantly increased between 2013 and 2016. They added this occurred because the ICU did not have the resources to meet the demands of requests from both the public and the Vision Zero<sup>4</sup> initiative. As a result of the backlog, many studies remained at the ICU for long periods without being entered into SWOTS or assigned to an inspector. To reduce the backlog, the ICU implemented changes in 2017 such as:

- Digitizing intersection study books and customer response letters;
- Adding ICU supervisors;
- Creating an NYPD crash data interface, allowing inspectors to instantly pull crash data from the NYPD database;
- Shifting the responsibility of timing study fieldwork from the ICU to the STU; and
- Switching from an older database to SWOTS.

Once these measures were implemented during 2017, the backlog began to decrease. However, we found it still took the ICU an average of seven months to complete the 16 study requests we sampled that were assigned to the ICU in 2018 or later.

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<sup>4</sup> Vision Zero is a multi-agency, multi-pronged approach to improving street safety throughout the City. It seeks to eliminate all deaths from traffic crashes, regardless of whether on foot, bicycle, or inside a motor vehicle.

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## Signal Construction

Once a traffic signal's timing plan and design are approved, a work order for the construction and installation of the signal is sent to the contractor. The signal contracts require contractors to complete a work order within 45 days; however, we found that was generally not the case. Of the 78 intersection studies we reviewed, 14 resulted in a signal approval, of which 6 had work orders that were sent to the contractor. Four of the 6 cases (67 percent) did not meet the 45-day contractual requirement. The time it took to complete the signal installation for the four cases ranged from 47 to 97 days. The Department did not provide explanations for the cases with overdue work orders.

## Proactive Studies

Department officials told us that, as a proactive initiative, the RIS unit provided the ICU with data-driven lists of non-signalized intersections that had five<sup>5</sup> or more preventable<sup>6</sup> crashes within a 12-month period (five or more preventable crashes is one criterion to meet one of the warrants as defined in the MUTCD). The lists were sent to the ICU so it could conduct a study and determine if a traffic control device should be installed. We reviewed a judgmental sample of 25 of the 423 proactive intersection studies.

The Enhanced Intersection Unit (EIU) within the TPM is one of the groups that receive referrals, and is responsible for re-examining safety measures at intersections, such as additional signage, markings, and traffic calming measures (e.g., speed humps, reduced speed zones, shorter distances for crosswalks). The ICU may send a case to the EIU after a signal request is denied at an intersection; however, it does not receive information from the EIU on the work done at the intersection. Five of the 25 sampled cases on the proactive lists showed they were sent to the EIU. Despite our requests, the Department did not provide any documentation that the EIU took action to determine if safety measures should be implemented at these locations.

In addition, 10 of the 25 cases did not contain adequate support for the ICU's study conclusions. For example, four of the five signal approvals that were based on a warrant requiring automated eight-hour traffic counts did not contain the traffic counts and none of the files contained an explanation for why the eight-hour counts were not conducted. Further, one of the cases that resulted in signal request denial contained a note stating the decision was made based on a conversation with the STU Director, but the details of the conversation were not documented.

The ICU approved a signal or multi-way stop at 21 of the 25 sampled intersections. Of the 21 intersections, 18 were approved prior to January 1, 2020. We visited the 18 intersections on March 11, 12, and 13, 2020, and found that 5 did not have the

5 The first proactive list contained eight intersections with four preventable crashes, which Department officials attributed to a bug in the code.

6 Types of preventable crashes include right angle, left-turning vehicles with straight-through traffic, and those involving pedestrians.

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approved traffic control device installed. The documentation for one case indicated that the installation was on hold due to ongoing construction. The information for the other four cases was as follows:

- A traffic signal was approved for an intersection in Queens on July 15, 2019. The Department sent letters to external customers that it planned to have the signal completed by January 31, 2020. We saw signal construction at the intersection, but the work had not been completed as of March 12, 2020.
- A traffic signal was approved on September 23, 2019 for another intersection in Queens. According to response letters sent to external customers, the Department planned to complete the signal by March 31, 2020; however, the signal was not installed on March 12, 2020 and we did not see any construction activity or evidence that it was being installed.
- On August 26, 2019, a traffic signal was approved at yet another intersection in Queens. The response letters sent to external customers indicated that Department planned to have the signal completed on February 29, 2020. We visited the intersection on March 12, 2020 and the signal was not installed.
- A multi-way stop with louvers<sup>7</sup> on the traffic signals at adjacent intersections in Brooklyn was approved on October 21, 2019. An email requesting the installation of both multi-way stop signs and louvers did not contain a date when the devices would be installed. When we visited the intersection on March 13, 2020, the louver was installed on the traffic signal at one intersection, but we did not see the multi-way stop sign at the adjacent intersection. The case documentation did not explain why the multi-way stop was not installed.

## Recommendations

1. Revise the Department's Resource Guide to make meeting the time frames a requirement and to ensure that corrective action is taken when needed.
2. Revise the SWOTS database as follows:
  - Automatically add cases sent via ARTS;
  - Maintain the original dates when dates are modified;
  - Permit only designated managers to edit dates; and
  - Maintain a log to document who made changes and when.
3. Develop a process for the ICU to ensure that improvements recommended by its inspectors are implemented promptly. Document the reasons recommendations were not implemented or were modified.

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<sup>7</sup> A louver is a device that can be mounted inside a signal visor to restrict visibility of a signal indication from the side or to limit the visibility of the signal indication to a certain lane or lanes or to a certain distance from the stop line.

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4. Ensure that intersection study files contain all required documentation including, but not limited to, information supporting the conclusions in accordance with MUTCD guidelines.
  5. Monitor contractors' construction and installation of traffic signals to ensure work orders are completed within 45 days, as required by the contracts.
  6. Ensure the EIU reviews cases from the ICU and documents the results regarding any safety improvements that can be made to an intersection.

## Traffic Monitoring

### Camera Repair

The Department installed video surveillance equipment, including traffic cameras, at strategic locations within the City for the purpose of monitoring and managing traffic conditions in real time.

According to TMC's SOPs, its staff are required to check cameras daily to determine if they are working and generate a Pending Cameras Repair log, which is emailed weekdays to the Department electricians. However, the SOPs are silent regarding time frames for electricians to share information with TMC staff.

In December 2019, the Department had 608 active traffic cameras. The Pending Cameras Repair log dated August 14, 2019 contained 73 cameras in need of repair. We selected 35 cameras in need of repair that were outstanding for over six months. We found that, for 24 of the 35 cameras, repair had been pending for over a year, with two cameras pending repair for over five years.

TMC officials do not follow up with the Department electricians to request that they fix the cameras. We were advised that, even though cameras are not repaired timely, other cameras in close proximity are used to monitor traffic. However, TMC officials pointed out three locations did not have nearby cameras to cover the intersections. As a result, the TMC's monitoring of traffic was hampered.

We requested supporting documentation showing electricians' efforts to repair the cameras at the three locations where a substitute camera was not available. The Department provided documentation for only one location.

### Traffic Management Center

The TMC's SOPs contain, among other things, staff responsibilities for monitoring traffic, incident management protocols, and additional procedures should severe weather arise. To document, monitor, search, and review past incidents, the TMC maintains an electronic log of traffic incidents that occur throughout the City.

To determine whether TMC staff followed the SOPs, we sampled 50 incidents such as roadwork accidents and disabled vehicles from the period January 1, 2016 through January 29, 2019. The tasks include immediately notifying other agencies

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(e.g., NYPD, New York State Department of Transportation), disabling traffic cameras, activating VMS and requesting other agencies to do so, and providing periodic updates about the incident. TMC staff also have to log the incident in the database indicating the reporting source, time, date, location, traffic direction, lanes affected, incident type, action taken, and whether a traffic camera has been disabled. The TMC also has to notify the JTMC and other agencies when the incident is closed, activate previously disabled resources, and log incident closure in the database.

We found 30 of the 50 incidents sampled (60 percent) did not include any description in the “Action Taken” field, including three incidents that were reported by the TMC. In response to our preliminary findings, TMC officials stated that the “Action Taken” field is now a required field.

TMC officials did not provide documentation to support the start and end of four incidents and the closure of another six incidents. They attributed the lack of documentation to the use of verbal communication between themselves and the other agencies. However, the lack of such documentation could hinder their efforts to determine whether all required actions were taken during an incident.

Further, we found discrepancies in the recording of three incidents. For example, the start time for one incident involving roadwork was recorded in the log as 3:58 p.m. with an end time of 4:19 p.m. However, according to an email notification, the roadwork started at 8:39 a.m. and ended at 4:19 p.m. Therefore, according to the TMC database, the roadwork lasted about 20 minutes, when it actually took more than 8 hours.

The SOPs require disabling a traffic camera from the public view if it is showing the incident scene, whether major or minor. TMC staff told us traffic cameras were not disabled for any of the 50 incidents because the camera feed would only be disabled for a major incident, such as an accident that resulted in a fatality. Our sample of 50 incidents included 16 accidents, but according to TMC officials, none of them met the conditions that would require disabling the camera view. We question how they made that determination because the log did not contain enough details to determine the nature of the accident or severity of the incident or any additional information about the incident that would indicate whether the camera should have been disabled.

TMC procedures contained incorrect or outdated information. For example, TMC officials told us that VMS polling reports, the timing plan monitoring log, Highway Advisory Radio, and the hard copy incident log book are no longer in use; however, the SOPs still instruct TMC staff to use these items. In response to our preliminary findings, Department officials stated they would review and update the SOPs.

The TMC also used MiM to improve traffic conditions in midtown Manhattan (First Avenue to Ninth Avenue between 34th Street and 57th Street) by identifying traffic issues and automatically adjusting signal patterns to smooth traffic flow. TMC operators can override the proposed changes in real time.

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During the course of the audit, Department officials told us that MiM runs from 8 a.m. to 12 a.m. In November 2019, they advised us the hours were changed as of June 10, 2019, to 11 a.m. to 11 p.m. They informed us that the change was due to complaints received from various sources, including elected officials, citizens, and the First Deputy Commissioner of the Department. However, no formal studies were conducted to support the decision or to assess whether the change corrected the conditions that caused the complaints.

We reviewed the data provided by the Department for the period January 1, 2016 through March 14, 2019. Every six minutes, the system determines whether any signal timing changes are needed for each avenue included in the MiM area. We sampled ten events to determine whether the system provided the correct plan recommendation for each selected avenue based on the median<sup>8</sup> travel time and whether the median travel time was supported by vehicle data.

We found the system provided the correct plan recommendation, and the median travel time was supported by vehicle data for the ten sampled events. However, the Department did not provide documents to support the two events where the MiM operator rejected the system's recommendation. According to TMC officials, the operators are not required to document a reason for rejection.

TMC procedures do not contain any information related to MiM or criteria for the MiM operators to apply when determining whether to accept or reject the system's recommendation. Furthermore, there are no training manuals for TMC operators to use.

The MiM system is run on one dedicated computer terminal, which does not require an individual username and password to sign on. One user account and password is shared by all TMC staff for the MiM system. This is counter to the New York City Citywide Information Security Policy, Identity Management Policy, promulgated by the City's Department of Information Technology and Telecommunications, which states that users must be positively and individually identified and validated prior to being permitted access to any City computing resource. Moreover, using one account for all staff hinders the accountability of operator decisions related to accepting or rejecting the system's recommendation.

## Recommendations

7. Develop procedures regarding the camera repair process and update the Electrical Shop SOPs.
8. Revise and update TMC SOPs, including, but not limited to:
  - Current procedures for incident management; Requirements for TMC operators to enter all required information into the incident log database, including any actions taken based on verbal communication with other agencies;

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<sup>8</sup> The middle value in the set of numbers.

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- Instructions for staff to follow regarding broken traffic cameras, including communication and time frames; and
  - Procedures for the MiM system, including criteria for accepting or rejecting the system's recommendation, and documenting the reason for rejecting a recommendation.
9. Document changes made to the hours that MiM monitors traffic, including the reason.
  10. Develop a training program for the operators of the MiM system.
  11. Require unique sign-on credentials for all MiM users.

# Audit Scope, Objectives, and Methodology

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Our audit objectives were to determine whether the Department is monitoring and evaluating traffic flow at intersections and whether the Department took action to improve safe traffic and pedestrian flow at intersections. The audit covered the period January 1, 2016 through March 13, 2020.

To accomplish our objectives and to evaluate relevant internal controls, we met with Department officials to gain an understanding of procedures regarding intersection studies and traffic monitoring. We reviewed intersection study files for documentation in accordance with the ICU's procedures as well as to determine whether improvements recommended by ICU inspectors were addressed. We also made observations of 35 sampled intersections to determine if approved traffic control devices were installed (18 intersections) or recommended improvements were made (17 intersections). We met with TMC and Electrical Operations officials to understand their monitoring duties, the cameras pending repairs process, and the MiM system. We observed activities at the TMC on December 7, 2018 and April 30, 2019 to better understand the duties and assignments of TMC operators.

We selected a judgmental sample of 78 intersection studies from a population of 5,895. The sample included studies from 13 unique SWOTS status codes (00 - New Study Initiated [Not Assigned], 01 - New Study Initiated [Assigned], 11 - Denial - Sent to Enhanced Intersection, 12 - Case Forward to Another Unit, 18 - Study Request Denial, 20 - 150-New Contract Approval, 21 - Awaiting Automatic Traffic Recorder [ATR] Data, 36 - Study Request Denial, 45 - Study Request Denial, 54 - Senior Engineering Review, 55 - Signal Approval, 58 - Signal/Phase Modification, and 80 - All/Way Approval). We selected studies from each of the five boroughs and throughout the audit scope period. In addition to traffic signal and multi-way stop study requests managed by the ICU, the sample contained two types of study requests that the STU is responsible for: left-turn signal and leading pedestrian interval.<sup>9</sup> We also selected a judgmental sample of 25 "proactive studies" from two lists with 423 intersections provided to the ICU. The sample included six SWOTS status codes (11 - Sent to Enhanced Intersection, 45 - Denial, 55 - Signal Approval, 80 - All/Way Approval, 84 - All/Way Pre-Approval With Louver [Waiting Louver Installation], 85 - All/Way Approval With Louver), which were chosen based on factors such as study date, number of preventable crashes, and location.

We selected a judgmental sample of 35 cameras pending repair for more than six months out of 73 cameras included on the camera repair log generated on August 14, 2019. This date was selected because we met with the Department's Director of Electrical Operations on August 13, 2019 and requested the TMC Pending Cameras Repair log for the following day.

We also used a random number generator to select a random sample of 50 of 56,935 traffic incidents from the TMC incident log from January 1, 2016 to January 29, 2019. The sample was reviewed to determine whether TMC staff followed their SOPs when a traffic incident occurred or was reported to them. We also requested

<sup>9</sup> Prior to May 2017, the ICU conducted the preliminary intersection control analysis for these requests and sent the information to the STU for analysis. The STU has since taken over all work for these requests.

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supporting documentation, such as emails, to determine when incidents were reported (opened) and closed, as well as evidence of activation of TMC VMS or requests sent to other agencies to activate their VMS. We met with TMC officials on August 13, 16, and 20, 2019 and November 20, 2019 to obtain this documentation.

We selected a judgmental sample of ten MiM events from a population of 64,935 events provided by TMC officials for the period January 1, 2016 through March 14, 2019 (an event is when the system recommends a plan change on one or more of the avenues). We selected one event from 2016, one event from 2017, four events from 2018, and four events from 2019. From each sampled event, we judgmentally selected one avenue where the system recommended a change to determine if the recommendation was correct per the algorithm provided by TMC officials and whether the underlying vehicle data supported the proposed change. We selected two of the ten avenues with proposed changes the operator rejected to determine if the TMC could provide support for why the operator rejected the computer's recommendation. The remaining eight avenues had proposed changes that were accepted – three because the operator accepted the change and five because the operator did not make a decision within five minutes and, thus, the recommendation was automatically implemented.

We did not design our samples to be projected to the populations from which they arose, nor did we project them to the related populations. The findings and conclusions drawn as the result of the samples reviewed cannot be and were not extrapolated to the population as a whole.

# Statutory Requirements

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## Authority

This audit was performed pursuant to the State Comptroller's authority under Article V, Section 1 of the State Constitution and Article III, Section 33 of the General Municipal Law.

We conducted our audit in accordance with generally accepted government auditing standards. These standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained during our audit provides a reasonable basis for our findings and conclusions based on our audit objectives.

As is our practice, we notified Department officials at the outset of the audit that we would be requesting a representation letter in which agency management provides assurances, to the best of its knowledge, concerning the relevance, accuracy, and competence of the evidence provided to the auditors during the course of the audit. The representation letter is intended to confirm oral representations made to the auditors and to reduce the likelihood of misunderstandings. Agency officials normally use the representation letter to assert that, to the best of their knowledge, all relevant financial and programmatic records and related data have been provided to the auditors. They affirm either that the agency has complied with all laws, rules, and regulations applicable to its operations that would have a significant effect on the operating practices being audited, or that any exceptions have been disclosed to the auditors. However, officials at the New York City Mayor's Office of Operations have informed us that, as a matter of policy, mayoral agency officials do not provide representation letters in connection with our audits. As a result, we lack assurance from Department officials that all relevant information was provided to us during the audit.

In addition to being the State Auditor, the Comptroller performs certain other constitutionally and statutorily mandated duties as the chief fiscal officer of New York State. These include operating the State's accounting system; preparing the State's financial statements; and approving State contracts, refunds, and other payments. In addition, the Comptroller appoints members to certain boards, commissions, and public authorities, some of whom have minority voting rights. These duties may be considered management functions for purposes of evaluating organizational independence under generally accepted government auditing standards. In our opinion, these management functions do not affect our ability to conduct independent audits of program performance.

## Reporting Requirements

We provided a draft copy of this report to Department officials for their review and formal comment. Their comments were considered in preparing this final report and are attached in their entirety at the end of it.

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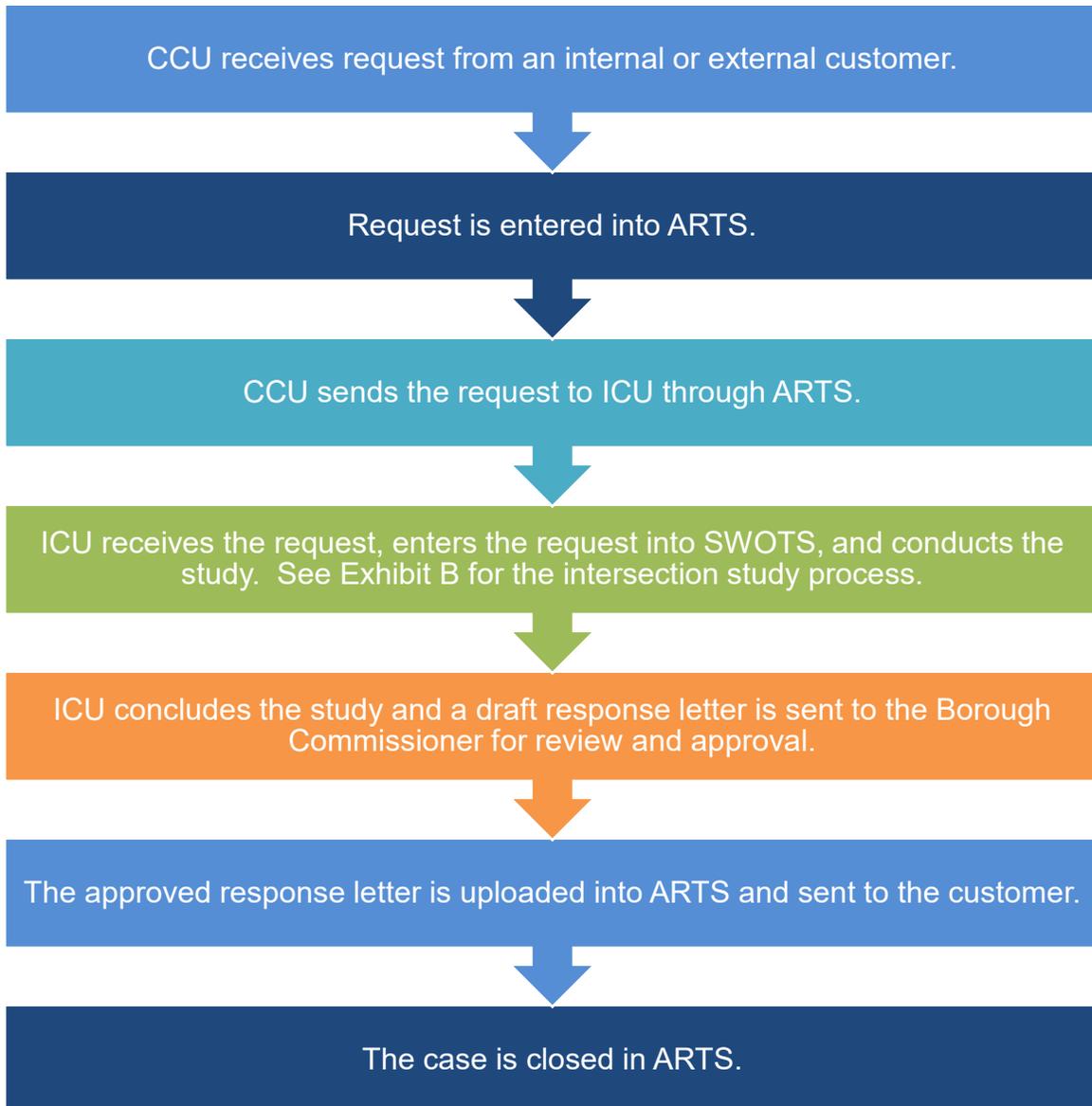
The Department disagreed with our findings and conclusions, stating that documentation to address discrepancies was provided to us but was not reflected in the draft audit report. The Department also stated repeatedly that there is no Enhanced Intersection Unit. However, the Department's official documents indicate otherwise. For example, multiple Signals Work Order Tracking System ICU Buck Slips that the Department provided to us list as an outcome that the items were sent or referred to the Enhanced Intersection Unit (see examples on pp. 35–37). Additionally, a listing of proactive studies from the Department staff records the outcome for several cases as sent to the Enhanced Intersection Unit. If no such unit exists, the Department needs to educate its employees and ask them to eliminate references to this unit. The Department also added that information to address other points was provided in response to preliminary findings. However, the Department neglected to respond to these particular preliminary findings despite our repeated requests. The Department agreed or partially agreed with 9 of the 11 recommendations. We urge the Department to focus on the opportunities to improve the process for addressing issues identified by the public and its inspectors (proactive studies). Our rejoinders to certain of the Department's comments are included in the report as State Comptroller's Comments.

Within 180 days of the release of our final report, we request that the Commissioner of the New York City Department of Transportation report to the State Comptroller, advising what steps were taken to implement the recommendations contained herein, and if the recommendations were not implemented, the reasons why.

# Exhibit A

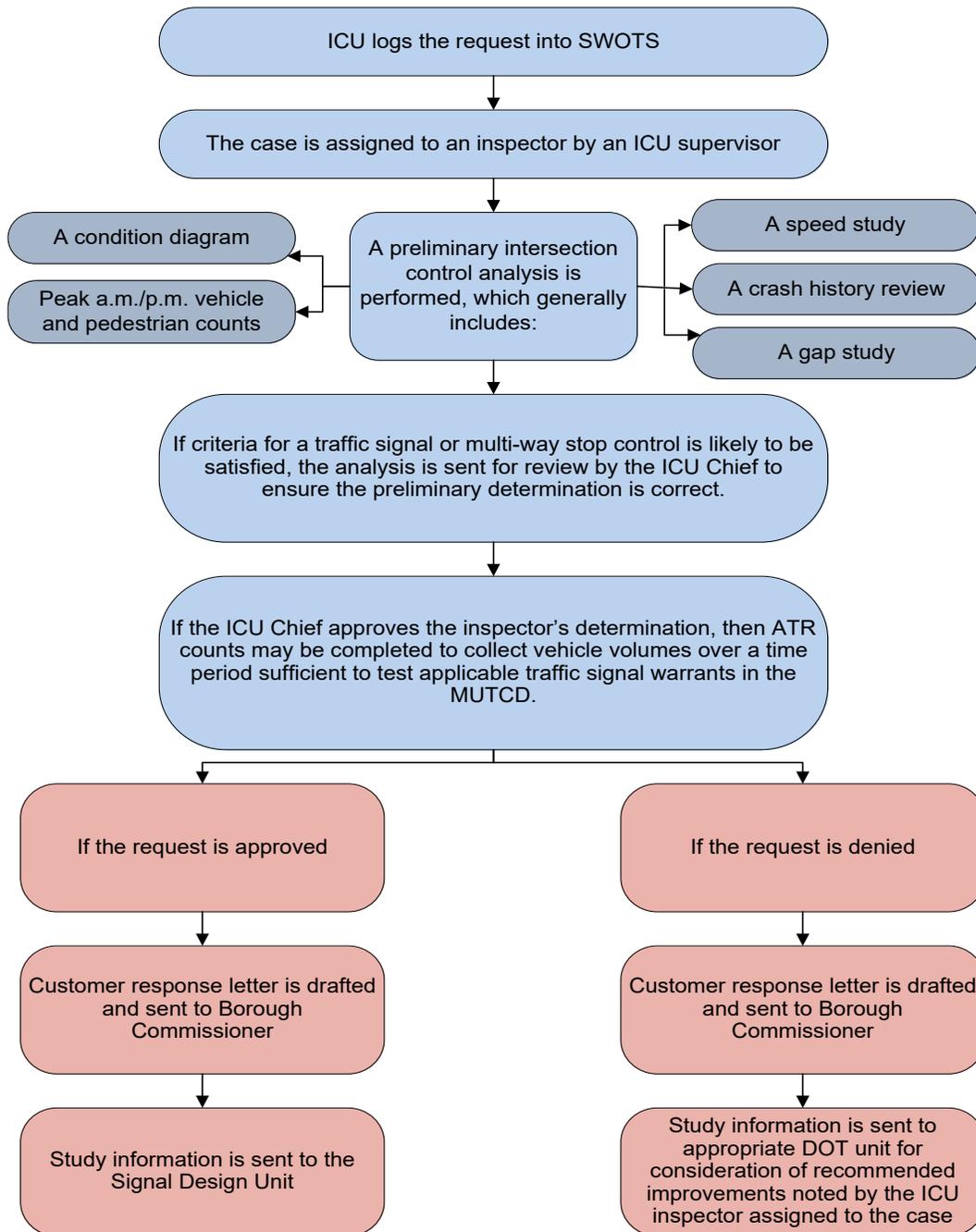
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## CCU Intersection Study Process



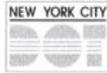
# Exhibit B

## ICU Intersection Study Process



# Agency Comments

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Department of Transportation

POLLY TROTTEBERG, Commissioner

September 18, 2020

Carmen Maldonado  
Office of the State Comptroller  
Division of State Government Accountability 59 Maiden Lane - 21st Floor  
New York, NY 10038

**Re: Response to the Draft Audit Report on the Department of Transportation's Oversight of Selected Aspects of Traffic Controls (Report # 2018-N-6. Dated August 1, 2020)**

Dear Ms. Maldonado,

This letter is in response to the recommendations reflected in the referenced Draft Audit Report. We disagree with the results of the report findings and conclusions in several respects. Although the New York City Department of Transportation (DOT) advised the auditors of our disagreement and provided clarifying documentation for their review to address discrepancies contained within the Draft Audit Report, the findings and conclusions reached remain largely unchanged. Please accept the following as the Agency's written response to the Draft Audit Report:

#### About the Program (Background)

We have repeatedly provided the auditors clarification that there is no unit within DOT referred to as the Enhanced Intersection Unit. Since an understanding has not been reflected in the audit report, clarification will be provided, again, in this final response. There is no separate unit called the "Enhanced Intersection Unit". Certain units within DOT's Division of Transportation Planning and Management (TPM) review referrals from the Intersection Control Unit (ICU) within DOT's Division of Traffic Operations depending on the treatment requested for evaluation. A request for an "enhanced intersection crossing" would be reviewed by DOT's Pedestrian Unit, within TPM's larger Office of Street Improvement Projects. Note that this is only one potential type of alternative treatment that could be requested for evaluation. The TPM Division, in addition to other responsibilities, implements safety and traffic calming measures including signage, markings, speed humps, reduced speed zones, and shorter distances for crosswalks.

[Comment 1](#)

#### Key Findings and Recommendations

Page #1/2, Bullet #2: *We visited 17 intersections where the ICU recommended improvements and found six improvements that were not implemented and no evidence of the decisions made regarding the recommended improvements.*

#### NYCDOT's Response:

In the current workflow, ICU only makes a recommendation to units within TPM; it is ultimately up to the subject matter experts in the other divisions/units to determine if these locations need to be assessed and whether enhancements are necessary.

[Comment 2](#)



Page 5 EIU: – Electrical Inspection Unit is the correct name of this Unit.

Comment 3

Audit Findings and Recommendations.

Page 7, Paragraph 4:

*We also found that the Department's monitoring of traffic is hampered due to traffic cameras that remain unrepaired for long periods of time and an incomplete traffic incident log. Out of 35 cameras requiring repairs that were outstanding for over six months, we found 24 had tickets that were open over 12 months, including one pending repair for over five years. In addition, TMC's incident log, which documents traffic incidents that affect City motorists, did not always contain required information such as actions the TMC took when an incident was reported (e.g. notifying other agencies, activating Variable Message Signs [VMS],<sup>3</sup> changing signal timing).*

NYCDOT's Response:

As stated previously, if a traffic camera is down due to a long-term condition such as major construction, the camera will stay open for repair for a long time period until the camera can be repaired or re-installed if it was removed due to the construction. Some of the cameras were using NYCWiN wireless communication which had multiple coverage and signal issues citywide.

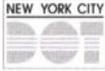
Prior to 7/30/2019, the description for the "action taken" was not required in the log. However, this doesn't mean that the staff did not take appropriate actions when necessary, such as coordinating the actions with other agencies and using available VMS's to inform motorists. Since 7/20/2019, the database has been updated and the "Action Taken" field is mandatory and cannot be left blank.

Page 8, Intersection Studies, paragraph 2:

*For example, a request was received on October 21, 2013 to address safety concerns for a traffic signal along Center Boulevard between 46th and 50th Avenues in Queens. The requester wrote that an increasing number of vehicles using the road were traveling at significant speeds. The case was sent to the ICU about a week after it was received; however, it was not entered into SWOTS until September 8, 2016, almost three years later. A denial letter was sent to the requestor on December 28, 2017, over four years after the request was initially received by the Department. The location was re-evaluated on April 28, 2018, and a multi-way stop was approved on May 29, 2018 and installed on June 8, 2018.*

NYCDOT's Response:

As mentioned in earlier responses, this was due to a transition between the previous database (DB3) to SWOTS tracking systems, and ARTs was still in the developments stages.



Page 11, paragraph 2:

*To determine if a warrant for a traffic control device is met, inspectors review data from NYPD's crash database. However, 10 of the 78 studies did not have a crash report in the file, and 2 of the 10 studies were denied without any evidence of a crash history review. In the absence of documentation, the Department lacks reasonable assurance that a warrant or other criteria were not met.*

NYCDOT's response:

Crash history is not required for all traffic signal approvals. There are certain warrants where a traffic control device could satisfy a warrant regardless of crash history. Warrant #7, which is the crash warrant, is tied to Warrant #1, which is the volume warrant. When warrant #7 is met, the threshold volume is reduced by 20% and then the volume is re-assessed again to see if warrant #1 is met. Therefore, even if warrant #7 is met, it does not automatically mean that a new signal is warranted. Moreover, warrant #1 can be satisfied by volume alone without the reduction afforded by the crash warrant.

[Comment 4](#)

Page 11, paragraph 3:

*We concluded that the lengthy time to complete a study was due, in part, to the fact the ARTS and S\A\DTS systems were not integrated. As a result, ICU staff have to manually enter the requests into the S\A\DTS system before an inspector can be assigned. Further, management's monitoring of the actual time a case is open is lowered, because the SWOTS system allows users to modify dates. Similarly, the ARTS system allows ICU users to change the due date field, which could hinder the CCU's monitoring of how long a case has been open.*

NYCDOT's Response:

As of May 2018, the link was automated between ARTS and SWOTS. In March 2020, the due date in ARTS was locked so that an operational user cannot edit that field. The user is still allowed to change the due date field manually in SWOTS (Which should be four months after the request date field).

[Comment 5](#)

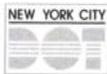
Page 12, Signal Construction, paragraph 1

*Once a traffic signal's timing plan and design are approved, a work order for the construction and installation of the signal is sent to the contractor. The signal contracts require contractors to complete a work order within 45 days; however, we found that was generally not the case. Of the 78 intersection studies we reviewed, 14 resulted in a signal approval, of which 6 had work orders that were sent to the contractor. Four of the 6 cases (67 percent) did not meet the 45-day contractual requirement. The time it took to complete the signal installation for the four cases ranged from 47 to 97 days. The Department did not provide explanations for the cases with overdue work orders.*

NYCDOT's Response:

Responses for several of the signal construction delays were provided for prelim #3, however this is not noted in the draft report

[Comment 6](#)



Page 12, Proactive Studies, paragraph 1

*Department officials told us that, as a proactive initiative, the RIS unit provided the ICU with data-driven lists of non-signalized intersections that had five<sup>5</sup> or more preventable<sup>6</sup> crashes within a 12-month period (five or more preventable crashes is one criterion to meet one of the warrants as defined in the MUTCD). The lists were sent to the ICU so they could conduct a study and determine if a traffic control device should be installed. We reviewed a judgmental sample of 25 of the 423 proactive intersection studies.*

NYCDOT's Response:

The Research, Implementation and Safety (RIS) unit within TPM provided the ICU with the data driven lists of intersections containing five or more crashes. After closer review each case, some of the crashes were not "preventable" and therefore could not be applied toward satisfaction of the warrant. For this reason some of the data driven locations when studied were rejected.

Page 12, paragraph 2:

*The Enhanced Intersection Unit (EIU) within the TPM is responsible for implementing safety measures at intersections such as additional signage, markings, and traffic calming measures such as speed humps, reduced speed zones, and shorter distances for crosswalks. The ICU may send a case to the EIU after a signal request is denied at an intersection; however, it does not receive information from the EIU on the work done at the intersection. Five of the 25 sampled cases on the proactive lists showed they were sent to the EIU. Despite our requests, the Department did not provide any documentation that the EIU took action to determine if safety measures should be implemented at these locations.*

NYCDOT's Response:

Please see earlier response related to terminology of EIU. We recommend changing the wording for this paragraph.

[Comment 1](#)

TPM is responsible for implementing safety measures at intersections such as additional signage, markings, and traffic calming measures such as speed humps, reduced speed zones, and shorter distances for crosswalks. The ICU may send a case to the Pedestrian Unit within TPM after a signal request is denied at an intersection; however, it does not receive information from the Pedestrian Unit on the work done at the intersection. Five of the 25 sampled cases on the proactive lists showed they were sent to the Pedestrian Unit.

Additionally, in the responses to preliminary #6, we provided information that of these five cases, three ended up being approved for signals at a later date, one was approved for an All-way stop and one was approved for an enhanced crossing treatment.

[Comment 7](#)

Page 12, paragraph 3:

*In addition, 10 of the 25 cases did not contain adequate support for the ICU's study conclusions. For example, four of the five signal approvals that were based on a warrant requiring automated*



## Department of Transportation

POLLY TROTTEBERG, Commissioner

*eight-hour traffic counts did not contain the traffic counts and none of the files contained an explanation for why the eight-hour counts were not conducted. Further, one of the cases that resulted in signal request denial contained a note stating the decision was made based on a conversation with the STU Director, but the details of the conversation were not documented.*

### NYCDOT's Response:

In the past, there was no formal documentation when assessing the operational feasibility of the new traffic signals. Staff only had verbal conversation between ICU and Signal Timing Unit (STU). Beginning in February 2020 on 2/2020, a follow up with e-mail for documentation purposes was added to the workflow to complement the verbal communication.

### Recommendations:

#### Audit Recommendation 1:

Revise the Department's Resource Guide to make meeting the time frames a requirement and to ensure that corrective action is taken when needed.

### NYCDOT's Response: **Partially Agree**

As stated in preliminary response #3, recommendation #1: There is frequent communication between ICU and Commissioner's Correspondence Unit (CCU) staff through weekly reporting, emails and other communications. Traffic Operations and CCU are discussing potentially changing the timelines in the CCU guidance (the agency Resource Guide) to better reflect the actual work timelines of the ICU.

#### Audit Recommendation 2:

Revise the SWOTS database as follows:

- Automatically add cases sent via ARTS;
- Maintain the original dates when dates are modified;
- Permit only designated managers to edit dates; and
- Maintain a log to document who made changes and when

### NYCDOT's Response: **Agree**

ICU agreed with these recommendations and worked with the Information Technology and Telecom (IT) Division to implement. These improvements to SWOTS were made in July 2020.

#### Audit Recommendation 3:



Develop a process for the ICU to ensure that improvements recommended by its inspectors are implemented promptly. Document the reasons recommendations were not implemented or were modified.

NYCDOT's Response: **Disagree**

This is a misunderstanding of the role of the ICU. ICU is not directing improvements or enhancements at intersections; rather they are making observations and potential recommendations to be considered by other units within DOT, which have the expertise in studying those measures. DOT will consider implementing a referral process where a case would be re-routed to the responsible unit and in which the Commissioner's Correspondence Unit (CCU) would track the timeliness of the case. DOT will be exploring appropriate measures, as this will require collaboration between multiple Divisions within the agency.

[Comment 8](#)

Audit Recommendation 4:

Ensure that intersection study files contain all required documentation including, but not limited to, information supporting the conclusions in accordance with MUTCD guidelines.

NYCDOT's Response: **Agree**

DOT will develop a process to assign a quality assurance function within the ICU to determine whether documentation is included in case files for future reference.

Audit Recommendation 5:

Monitor contractors' construction and installation of traffic signals to ensure work orders are completed within 45 days, as required by the contracts

NYCDOT's Response: **Partially Agree**

The Electrical Inspection Unit (EIU) within the Traffic Operations Division monitors the work conducted by the electrical contractors per their contract requirements. The majority of traffic signal installations meet the 45-day contracted requirement. However, there are occasionally factors outside of the contractor or the Traffic Operations Division's control that affect the timeframes. These factors have included, but are not limited to, the timeframe of other projects (both internal to DOT and other agencies), weather conditions, and construction permit hours (days and hours of allowed construction activity). Additionally, timeframes may be affected by increased timeframes associated with permit applications, utility markouts, and the timeframes associated with Accessible Pedestrian Signal (APS) installation at all new signalized intersections. Due to



these factors, the Traffic Operations Division is re-evaluating what the fair and reasonable time frame for signal installations will be for the signals contracts moving forward, as such contract language would be modified accordingly.

Audit Recommendation 6:

Ensure the EIU reviews cases from the ICU and documents the results regarding any safety improvements that can be made to an intersection.

NYCDOT's Response: **Disagree**

This is a misunderstanding of the role of the ICU. ICU is not directing improvements or enhancements at intersections; rather they are making observations and potential recommendation to be considered by other unit, which have the expertise in studying those measures. DOT will consider implementing a referral process where a case would be re-routed to the responsible unit and in which CCU would track the timeliness of the case. DOT will be exploring appropriate measures as this well require collaboration between multiple Divisions within the agency.

[Comment 9](#)

Audit Recommendation 7:

Develop procedures regarding the camera repair process and update the Electrical Shop SOPs.

NYCDOT's Response: **Agree**

Procedures will be updated and a monthly camera outage list will be reviewed by appropriate staff from TMC and Electrical Operations. This process will be developed and implemented over the next several months.

Audit Recommendation 8:

Revise and update TMC SOPs, including, but not limited to:

- Current procedures for incident management;
- Requirements for TMC operators to enter all required information into the incident log database, including any actions taken based on verbal communication with other agencies;
- Instructions for staff to follow regarding broken traffic cameras, including communication and time frames; and
- Procedures for the MiM system, including criteria for accepting or rejecting the system's recommendation, and documenting the reason for rejecting a recommendation



NYCDOT's Response: **Partially Agree**

- *Current procedures for incident management:* **Agree – current procedures will updated accordingly.**
- *Requirements for TMC operators to enter all required information into the incident log database, including any actions taken based on verbal communication with other agencies:* **Agree: Currently the database has been updated and the “Action Taken” field has been made mandatory and cannot be left blank.**
- *Instructions for staff to follow regarding broken traffic cameras, including communication and time frames:* **Partially Agree: Staff will be instructed on new procedures for broken traffic cameras. However, the time frame of repair cannot be defined due to other priorities, however we will set a monthly mandatory status update for all cameras.**
- *Procedures for the MiM system, including criteria for accepting or rejecting the system's recommendation, and documenting the reason for rejecting a recommendation:* **Agree: We will update our SOP to include a section concerning the MiM operations and provide the operators with clear instructions regarding the overall operations of the MiM system.**

Audit Recommendation 9:

Document changes made to the hours that MiM monitors traffic, including the reason

NYCDOT's Response: **Agree**

Future changes to the operational hours of MiM will be documented.

Audit Recommendation 10:

Develop a training program for the operators of the MiM system.

NYCDOT Response: **Agree**

TMC will develop enhanced training for operators of MiM. We will update our SOP to include a section concerning the MiM operations and provide the operators with clear instructions regarding the overall operations of the MiM system.

Audit Recommendation 11:

Require unique sign-on credentials for all MiM users

NYCDOT Response: **Agree**

The program was originally created in 2011. The program, as designed, was intended to be accessible from one terminal by one operator. We are looking to upgrade the system to be



Department of Transportation

POLLY TROTTEBERG, Commissioner

consistent with DoITT policies, the next software version will provide for multiple users with separate login credentials.

Sincerely,

A handwritten signature in blue ink that reads "Joshua Benson".

Joshua Benson, AICP  
Deputy Commissioner for Traffic Operations  
NYCDOT

Cc: Commissioner Trottenberg; J. Jarrin, Exec. D/C, DOT; M. Forgione, COO, DOT; S. Pondish, General Counsel DOT; R. Livermon, Director DOT; J. Economos, Dep. Director, DOT; J. Thamkittikasem, Director, Mayor's Office of Ops; F. Ardolli Assoc. Dep. Director, Mayor's Office of Ops; B. Hamed, Chief of Staff, Mayor's Office of Ops

# State Comptroller's Comments

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1. The Department repeatedly clarifies that there is no separate Enhanced Intersection Unit. However, contrary to this assertion, during fieldwork, the Department provided us with multiple documents from its case files that reference such a unit, examples of which are appended to this report (pp. 35–37). In fact, as further demonstrated on page 38, a form in the SWOTS database contains a status code option that references the Enhanced Intersection Unit. These and other forms from the Department's records are dated from March 2019 to October 2019. Moreover, the updated list of proactive cases received from ICU on February 11, 2020 shows the status as "Enhanced Intersection" for 34 cases. We selected 5 of these cases for review and were not told in response to our requests for this information that the status was incorrect.
2. We do not state that the ICU makes decisions but rather that the response to the ICU's recommendations is not documented. The Department invests a significant amount of time on intersection studies and subsequent reviews by other groups, and the results should be documented in a formal written decision.
3. Please see Comment 1.
4. There was no information in the files reviewed indicating why the crash history report was not reviewed. As such, the Department lacks reasonable assurance that a warrant or other criteria were not met. We presented these findings in meetings with Department officials on August 22 and December 20, 2019, and included them in our preliminary findings issued to the Department on August 29 and December 27, 2019. In its response to our first preliminary findings, which we received on November 15, 2019, the Department did not raise any issues or provide clarification regarding the lack of crash history reports. Despite our repeated requests, the Department did not provide a response to the preliminary findings issued on December 27, 2019.

Responding to the draft audit report, Department officials agreed with Recommendation 4 – that the Department ensure that intersection study files contain all required documentation including support for conclusions in accordance with MUTCD guidelines. In cases where the crash history report is not required because another warrant has been met, this should be noted in the case file.

5. During a meeting with Department officials on March 7, 2019, we were informed that information in ARTS was manually inputted into SWOTS. Further, officials stated that the agency was looking to interface the systems so that information is automatically transferred from ARTS to SWOTS. Thus, its response – that as of May 2018 the link was automated between ARTS and SWOTS – is not in keeping with information provided to the auditors. Moreover, we note that the Department's response to our preliminary findings did not state that the link was automated in May 2018.
6. On December 27, 2019, we issued our third preliminary findings document, which included a schedule of the specific cases that did not meet the 45-day requirement. In the cover letter, we requested a response by January 10, 2020. Despite our repeated follow-up and the Department's promises of a response, we did not receive a response to this set of preliminary findings. No changes could be considered as no such information was received from the Department.
7. We issued our sixth preliminary findings document on April 9, 2020 with a request for a response by April 30, 2020; however, we did not receive a response to this set of preliminary findings. No changes could be considered as no such information was received from the Department.

- 
8. As stated in Comment 6, Department officials did not respond to the third preliminary findings document. There is no misunderstanding. We understand that ICU is not directing improvements or enhancements at intersections. However, as noted in the Department's response, ICU inspectors make observations for improvement and refer them to the appropriate units. Our recommendation is that ICU follow up to ensure that the improvements are implemented or to document reasons why recommendations were not implemented or were modified. We urge Department officials to reconsider their disagreement with this recommendation.
  9. There is no misunderstanding. We understand that ICU is not directing improvements or enhancements at intersections. However, as noted in the Department's response, ICU inspectors make observations for improvement and refer them to the appropriate units. Our recommendation is that the Enhanced Intersection Unit review the cases that an ICU inspector determined could lead to safety improvements and document such review. We urge Department officials to reconsider their disagreement with this recommendation.



## Signals Work Order Tracking System

### ICU Buck Slip

**From:** 3/20/2019

**Reference Number:** CK17-0684      **Created By:** [REDACTED]      **Date Created:** 3/21/2017  
**Study Unit:** ICU      **Old Ref Number:** N/A      **Re-Eval Date:**  
**X-Reference Number:** N/A

#### Location

**Borough:** Brooklyn      **Location Type:** Intersection      **Compass Direction 1:**      **Compass Direction 2:**  
**Main Street:** WORTMAN AVENUE      **Cross Street 1:** LINWOOD STREET      **Cross Street 2:**  
**Node IDs:** 0029706      **School District:** 19  
**Community District:** 05      **Assembly District:** 60  
**Police Precinct:** 075      **City Council District:** 42

#### Case Detail

**Status:** 45 - Study Request Denial (ICU)      **Study Status:** CLOSED      **Status Date:** 5/16/2017  
**Request Type:** Traffic Signal      **Request Date:** 3/21/2017      **Target Date:** 7/21/2017  
**Assigned Inspectors:** [REDACTED]      **Date Assigned:** 4/11/2017

#### Requestors

Requested By	Requestor Type	Requestor Title	X-Reference No.
[REDACTED]	AGENCY--NEW YORK CITY DEPT. OF TRANSPORTATION	[REDACTED]	

#### Study Type

**Removal:** No      **Mid-Block:** No      **Consultant:** No  
**Vision Zero:** No      **Seasonal:** No      **Hurricane Sandy:** No

#### School Information:

**SC Hold:** No      **SC X-ING:** No      **School ID:**      **School name:**

#### Inspector's Review Date

**AM Count:** 4/18/2017      **PM Count:** 4/18/2017      **Mid-Day Count:**  
**SC Dismissal:**      **Gap:** 4/18/2017      **Speed:** 4/18/2017  
**PED Count:**      **Other Studies:**

#### ATR Request

**ATR Request Date:**      **ATR Receive Date:**

#### Outcome

**Comments:** SENT TO ENHANCED INTERSECTION UNIT

**Findings:** T/S DENIED

**Warrants Satisfied:**

**Warrants Type:**

**Warrants Satisfied Date:**

**Signal On Date:**

**Tentative Signal Install Date:**

**All-way Stop Install Date:**



## Signals Work Order Tracking System

### ICU Buck Slip

Form: 5/20/2019

Reference Number: CX16-3250      Created By: [REDACTED]      Date Created: 12/5/2016  
 Study Unit: ICU      Old Ref Number: CX08-7034      Re-Eval Date: 4/4/2020  
 Reference Number: DOT-301883-S6Q9; DOT-332155-C8P5; DOT-346587-H0P6; DOT-348265-B5C7

#### Location

Neighborhood: Bronx      Location Type: Intersection      Compass Direction 1:      Compass Direction 2:  
 Main Street: WEST 192 STREET      Cross Street 1: UNIVERSITY AVENUE      Cross Street 2:  
 Route IDs: 0048678      School District: 10  
 Community District: 07      Assembly District: 78  
 Police Precinct: 052      City Council District: 14

#### Case Detail

Status: 36 - Study Request Denial (ICU)      Study Status: CLOSED      Status Date: 3/26/2018  
 Request Type: Traffic Signal      Request Date: 1/1/2018      Target Date: 2/28/2017  
 Assigned Inspectors: [REDACTED]      Date Assigned: 2/27/2017

#### Requestors

Requested By	Requestor Type	Requestor Title	X-Reference No.
[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	CITIZEN		
[REDACTED]	CITIZEN		

#### Study Type

Removal: No      Mid-Block: No      Consultant: No  
 Vision Zero: No      Seasonal: No      Hurricane Sandy: No

#### School Information:

IC Hold: No      SC X-ING: No      School ID:      School name:

#### Inspector's Review Date

AM Count: 3/22/2017      PM Count: 3/22/2017      Mid-Day Count:  
 SC Dismissal:      Gap: 3/22/2017      Speed: 3/22/2017  
 PED Count: 3/22/2017      Other Studies:

#### ATR Request

ATR Request Date:      ATR Receive Date:

#### Outcome

Comments: **SENT TO ENHANCED INTERSECTION UNIT 4/4/17**

Findings: T/S DENIED 04/04/2017

Warrants Satisfied:

Warrants Type:

Warrants Satisfied Date:

Signal On Date:

Tentative Signal Install Date:

All-way Stop Install Date:



# Signals Work Order Tracking System

## ICU Buck Slip

From: 5/29/2019

Reference Number: CS17-1247      Created By: [REDACTED]      Date Created: 5/31/2017  
 Study Unit: ICU      Old Ref Number: CS14-0975      Re-Eval Date:  
 X-Reference Number: DOT-337310-G6Y9; DOT-343338-K3M8

### Location

Borough: Staten Island      Location Type: Intersection      Compass Direction 1:      Compass Direction 2:  
 Main Street: WESTERVELT AVENUE      Cross Street 1: HENDRICKS AVENUE      Cross Street 2:  
 Node IDs: 0011205      School District: 31  
 Community District: 01      Assembly District: 61  
 Police Precinct: 120      City Council District: 49

### Case Detail

Status: 80 - A/W Approval (ICU)      Study Status: CLOSED      Status Date: 9/21/2017  
 Request Type: All-Way Stop      Request Date: 5/31/2017      Target Date: 9/29/2017  
 Assigned Inspectors: [REDACTED]      Date Assigned: 6/23/2017

### Requestors

Requested By	Requestor Type	Requestor Title	X-Reference No.
[REDACTED]	CITIZEN		
[REDACTED]	CITIZEN		

### Study Type

Removal: No      Mid-Block: No      Consultant: No  
 Vision Zero: No      Seasonal: No      Hurricane Sandy: No

### School Information:

SC Hold: No      SC X-ING: No      School ID:      School name:

### Inspector's Review Date

AM Count: 6/1/2017      PM Count: 5/31/2017      Mid-Day Count:  
 SC Dismissal:      Gap: 5/31/2017      6/1/2017      Speed: 6/1/2017  
 PED Count:      Other Studies:

### ATR Request

ATR Request Date:      ATR Receive Date:

### Outcome

Comments: REFERRED TO ENHANCED INTERSECTION UNIT 6/23/17... [REDACTED] HAS FOLDER FOR FLASHING LIGHT STUDY (7/26/17) - A/W APPROVED AS PER [REDACTED] IN THE MEETING 09/01/2017) SINCE 4 LEGS OF THE INTERSECTION ARE STOPPED AND THE 5TH IS NOT) ENGINEERING JU

Findings: A/W APPROVED

Warrants Satisfied:

Warrants Type:

Warrants Satisfied Date: 9/21/2017      Signal On Date:      Tentative Signal Install Date:

All-way Stop Install Date:

Signals Work Order Tracking System (SWOTS) v3.0.2

**Status**

Home / Administration / Status

Add

Status

Id	Code	Description
61	-	-
51	0	New Study Initiated (Signals Engineering)
15	00	New Study Initiated (NOT ASSIGNED) (ICU)
26	01	New Study Initiated (ASSIGNED) (ICU)
19	02	Additional Preliminary Survey Required (ICU)
3	03	New APS Study (Pending Survey) (ICU)
60	04	New Split Phase Signal Study (Pending Survey) (ICU)
62	092	092
70	10	Approval it can't be installed due to existing furniture
71	11	Denial - Sent to Enhanced Intersection
73	12	Case Forward to Another Unit
5	13	APS Ranking Completed; Awaiting Design (ICU)
72	18	Study Request Denial (ICU)
59	20	150-New Contract Approval
12	21	Awaiting ATR Data (ICU)
13	22	No Conflict operation working as Designed
8	23	APS in Design Phase (ICU)
20	30	Need(s) Additional Study(ies) (ICU)
14	31	Awaiting Acc Reports--Reportable Data (not in use) (ICU)
42	32	Awaiting Acc Reports--Non-Reportable Data (not in use) (ICU)
46	33	Awaiting NYPD Accident Reports (ICU)
56	34	2nd Acc Report Request (not in use) ICU
57	35	3rd Acc Report Request (not in use) (ICU)
6	36	Study Request Denial (ICU)
9	39	APS Design Completed (Awaiting Installation) (ICU)
4	40	APS Installed (ICU)
76	42	LPI Request forward to timing unit

# Contributors to Report

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## Executive Team

**Tina Kim** - *Deputy Comptroller*  
**Ken Shulman** - *Assistant Comptroller*

## Audit Team

**Carmen Maldonado** - *Audit Director*  
**Abe Fish** - *Audit Manager*  
**Nicholas Angel** - *Audit Supervisor*  
**Agnieszka Wolf** - *Examiner-in-Charge*  
**Samuel Carnicelli** - *Senior Examiner*  
**Brenda Maynard** - *Senior Examiner*  
**Kimberly Emmanuel** - *Staff Examiner*

## Contact Information

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