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CITY OF CHICAGO
OFFICE OF INSPECTOR GENERAL

AUDIT OF THE DEPARTMENT OF FLEET AND FACILITY MANAGEMENT'S MAINTENANCE OF POLICE VEHICLES

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TO THE MAYOR, CITY COUNCIL, CITY CLERK, CITY TREASURER, AND RESIDENTS OF THE CITY OF CHICAGO:

The City of Chicago Office of Inspector General (OIG) has completed an audit of the Department of Fleet and Facility Management's (2FM) maintenance of the Chicago Police Department's (CPD) vehicle fleet. Our objective was to determine whether 2FM meets the industry standard of at least 95% fleet availability. "Availability" is a fleet management performance measure that compares the number of hours a vehicle is expected to be available for use (e.g., 8 hours a day) to the number of hours it is actually available. Low vehicle availability could hinder police response and operations, negatively impacting the safety of officers and the public.

OIG found that 2FM could not determine whether it met the industry standard of at least 95% fleet availability because it lacked accurate availability data. We also found that, in 2017, 2FM performed only 12.9% of preventive maintenance in a timely manner. Diligent preventive maintenance helps to extend vehicle life, minimize repair costs, and avoid the downtime required for major repairs.

We recommend that 2FM work with CPD to obtain the data needed to accurately track vehicle availability, and thereby assess how effectively it manages the police fleet. We also recommend that 2FM perform timely preventive maintenance and determine what process improvements or additional resources it may need to achieve that goal. Finally, we recommend that 2FM work with CPD to improve communication and cooperation to ensure efficient management of CPD's fleet.

In response, 2FM said that it largely agrees with the recommendations and has moved quickly to implement corrective actions. The department reports that these changes, including better communication with CPD, have already improved its performance.

We commend 2FM on its collaborative approach and swift action, and thank staff and management for their cooperation during the audit.

Respectfully,

Joseph M. Ferguson
Inspector General

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY 3
A. CONCLUSION 3
B. FINDINGS 3
C. RECOMMENDATIONS 3
D. 2FM RESPONSE 4
II. BACKGROUND 5
A. CPD FLEET 5
B. PREVENTIVE MAINTENANCE AND REPAIRS 7
C. FLEET AVAILABILITY CALCULATION 9
III. FINDINGS AND RECOMMENDATIONS 11
FINDING 1: 2FM'S INACCURATE DATA PREVENTED IT FROM DETERMINING FLEET AVAILABILITY 11
FINDING 2: 2FM PERFORMED ONLY 12.9% OF PREVENTIVE MAINTENANCE ON TIME. 14
IV. OBJECTIVES, SCOPE, AND METHODOLOGY 18
A. OBJECTIVE 18
B. SCOPE 18
C. METHODOLOGY 18
D. STANDARDS 19
E. AUTHORITY AND ROLE 19
APPENDIX A: AVERAGE PREVENTIVE MAINTENANCE DELAYS IN 9 CPD DISTRICTS, JULY THROUGH OCTOBER 2018 20
APPENDIX B: INTERAGENCY FLEET COMMITTEE AGREEMENT 21

ACRONYMS

2FM	Department of Fleet and Facility Management
APWA	American Public Works Association
CPD	Chicago Police Department
FOP	Fraternal Order of Police
M5	AssetWorks FleetFocus M5 fleet management software
OBM	Office of Budget and Management

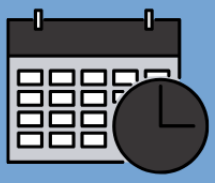
City of Chicago
Office of Inspector General

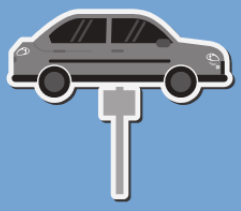
AUDIT OF THE DEPARTMENT OF FLEET AND FACILITY MANAGEMENT'S (2FM) MAINTENANCE OF POLICE VEHICLES

Inaccurate data prevented 2FM from determining vehicle availability in 2017

2FM performed 12.9% of preventive maintenance on time in 2017

In the districts OIG reviewed, 2FM requested CPD vehicles for preventive maintenance 68 days late on average





CPD took an average of 13 additional days to bring the vehicles to the 2FM facility to have the maintenance performed

I. EXECUTIVE SUMMARY

The Office of Inspector General (OIG) conducted an audit of the Department of Fleet and Facility Management's (2FM) maintenance of the Chicago Police Department's (CPD) vehicle fleet. 2FM manages CPD's 3,000-plus vehicles by making replacement purchases and performing maintenance and repairs on behalf of CPD. The objective of this audit was to determine whether 2FM meets the industry standard of at least 95% fleet availability for police vehicles, as recommended by the American Public Works Association (APWA). "Availability" is a fleet management performance measure that compares the number of hours a vehicle is expected to be available for use (e.g., 8 hours a day) to the number of hours it is actually available. Availability is a critical performance measure, because it measures a fleet management agency's success in achieving its primary objective—keeping vehicles on the road. Low vehicle availability could hinder police response and operations, negatively impacting the safety of officers and the public.

A. CONCLUSION

OIG concluded that 2FM's inaccurate data prevented the Department from assessing how effectively it managed the police fleet, and that 2FM did not perform most preventive maintenance in a timely manner.

B. FINDINGS

OIG found that 2FM could not determine whether it met the industry standard of at least 95% fleet availability because it lacked accurate availability data. 2FM did not maintain up-to-date information in 2017 regarding the hours when each vehicle was expected to be available for use, which is needed to calculate availability. We also found that the settings in 2FM's fleet management system created inaccurate data regarding when some vehicles are unavailable—also known as downtime—which is needed to calculate availability.

In addition, OIG found that in 2017 2FM performed only 12.9% of preventive maintenance in a timely manner. This low rate was primarily due to delayed requests from 2FM for CPD to deliver vehicles to its garages. OIG reviewed preventive maintenance data from a sample of 9 police districts in 2018, finding that 2FM requested vehicles an average of 68 days after they were due for maintenance and that CPD delivered the vehicles to a 2FM garage an average of 13 days after receiving the requests. Improperly maintained vehicles are likely to have shorter lifespans, more unscheduled downtime for repairs, and require more frequent and costly repairs.

C. RECOMMENDATIONS

We recommend that 2FM work with CPD to obtain correct information regarding the hours when vehicles are expected to be available, and to improve the accuracy of its data on vehicle downtime. We also recommend that 2FM perform preventive maintenance in a timely manner. To achieve that goal, 2FM should first analyze its operations to identify process improvement opportunities, and then determine if additional resources are needed. Finally, we recommend

that 2FM work with CPD to ensure efficient management of the police fleet by improving interdepartmental communication and cooperation.

D. 2FM RESPONSE

In response to our audit findings and recommendations, 2FM stated that it has improved data quality to calculate availability, adjusted staffing to meet maintenance demand, and is working closely with CPD to ensure that appropriate information sharing and operational collaboration is being implemented to ensure efficient and cost-effective fleet maintenance.

The specific recommendations related to each finding, and 2FM's response, are described in the "Findings and Recommendations" section of this report.

II. BACKGROUND

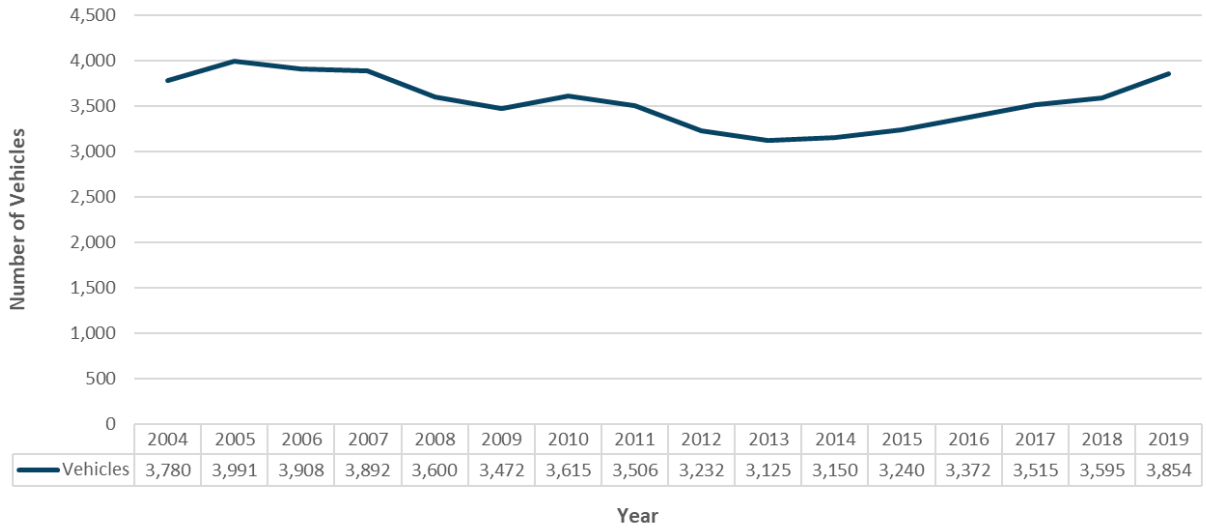
The Department of Fleet and Facility Management (2FM) maintains and manages the City of Chicago's physical assets, which include land, buildings, vehicles, and equipment used by City departments. 2FM reports that it is responsible for over 425 facilities, as well as 10,000 vehicles and pieces of equipment.

2FM's Bureau of Fleet Operations purchases new vehicles and maintains existing vehicles on behalf of the Chicago Police Department (CPD). It is CPD's responsibility to assign vehicles in its fleet to police districts and other operational units, and to bring the vehicles to 2FM garages for scheduled maintenance.

A. CPD FLEET

The size of CPD's fleet fluctuates as 2FM disposes of old vehicles and purchases new ones. 2FM reports that the number of CPD vehicles has varied over time from a high of 3,991 in 2005 to a low of 3,125 in 2013, as shown in Figure 1.

FIGURE 1: CPD fleet size varies over time

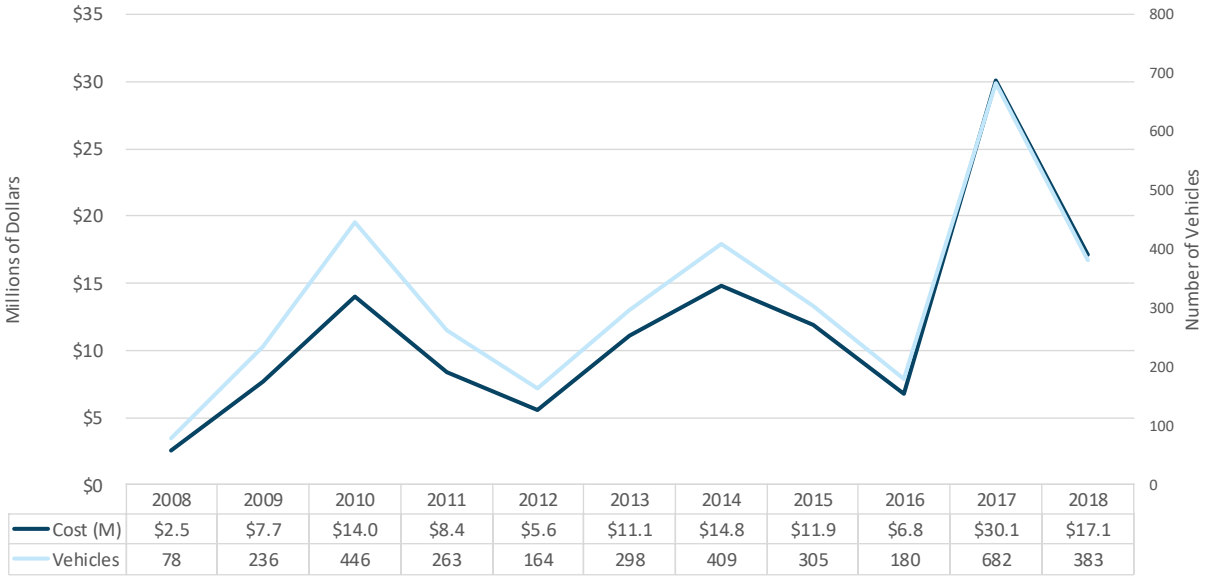


	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Vehicles	3,780	3,991	3,908	3,892	3,600	3,472	3,615	3,506	3,232	3,125	3,150	3,240	3,372	3,515	3,595	3,854

Source: OIG visualization of 2FM data.

One reason for the fluctuating size of CPD's fleet is that 2FM relies on funds from annual appropriations to address vehicle shortages in critical areas of need, rather than proactively replacing the fleet on a set schedule. 2FM told OIG that, on average, it receives only approximately half of the budget it would need to fund a true replacement schedule for CPD vehicles. From 2008 to 2018, annual expenditures on CPD vehicles ranged from $2.5 million to $30.1 million, and the number of vehicles purchased varied from 78 to 682, as illustrated by Figure 2.

FIGURE 2: CPD vehicle purchases vary by year



	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Cost (M)	$2.5	$7.7	$14.0	$8.4	$5.6	$11.1	$14.8	$11.9	$6.8	$30.1	$17.1
Vehicles	78	236	446	263	164	298	409	305	180	682	383

Source: OIG visualization of 2FM data.

Currently, 2FM maintains CPD vehicles until the end of their lifespan and then the Department of Procurement Services sells them for scrap.[1] According to 2FM, this practice is not cost effective, because older vehicles require more frequent and complex repairs, and their resale values decrease with age. Complex and frequent repairs also decrease the amount of time vehicles are available for CPD use, which may negatively affect police operations. In addition, a vehicle may be unexpectedly removed from service if 2FM determines that the necessary repairs exceed the vehicle's value, leaving CPD short of a vehicle until it is replaced.

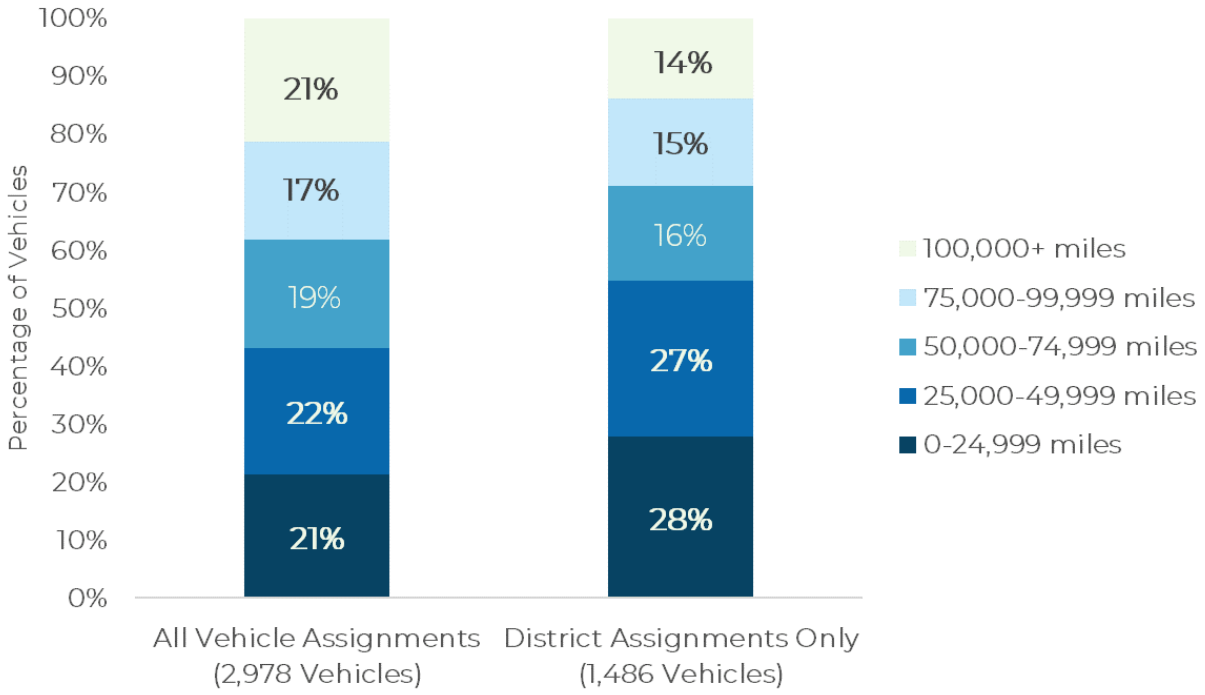
2FM told OIG that it has developed a multi-year replacement schedule which, if implemented, would reduce the average age of CPD's fleet, saving money in the long term and reducing disruptions to CPD's operations. According to 2FM, the schedule would replace vehicles before the end of their lifespan, thereby reducing overall maintenance costs and increasing the resale value of vehicles that exit the CPD fleet. Furthermore, because most vehicles would be removed on a planned basis, as opposed to an as needed basis, 2FM could reduce the impact on CPD operations by making replacements available immediately. 2FM, however, has not received sufficient appropriations to implement its preferred replacement schedule.

Ideally, 2FM would like to replace most CPD vehicles when they reach 75,000 miles, though individual replacement decisions would take into account the condition and useful life of each vehicle. According to CPD, it is especially important to assign newer vehicles to its 22 police districts, because they are used on all three shifts and receive more wear and tear than vehicles assigned to other parts of CPD (such as the organized crime, detective, and canine units). As of

[1] 2FM said the majority of CPD vehicles are crushed and sold for scrap because their resale value is less than the cost of selling them at auction. A small percentage of vehicles are sold at auction by the Department of Procurement Services.

June 2019, although 38% of CPD vehicles had 75,000 or more miles, OIG found that only 29% of vehicles assigned to CPD districts fell into that category. This confirms that CPD prioritizes assignment of new vehicles to the districts. Figure 3 shows the age of CPD's fleet, as measured by mileage.

FIGURE 3: Vehicles assigned to CPD districts have lower mileage than the department's overall fleet[2]



Source: OIG visualization of 2FM data.

B. PREVENTIVE MAINTENANCE AND REPAIRS

Vehicle maintenance consists of both preventive maintenance and repairs. The federal government's General Services Administration defines "preventive maintenance" as "the routine scheduled maintenance of motor vehicles," which includes "inspection …, tune-ups, oil changes, filter changes, verification and replenishment of fluids, lubrication, mechanical inspections, alignments, tire wear, and pressure checks."[3] "Repair" refers to unscheduled work needed when a vehicle is damaged or not functioning properly. 2FM tracks preventive maintenance and

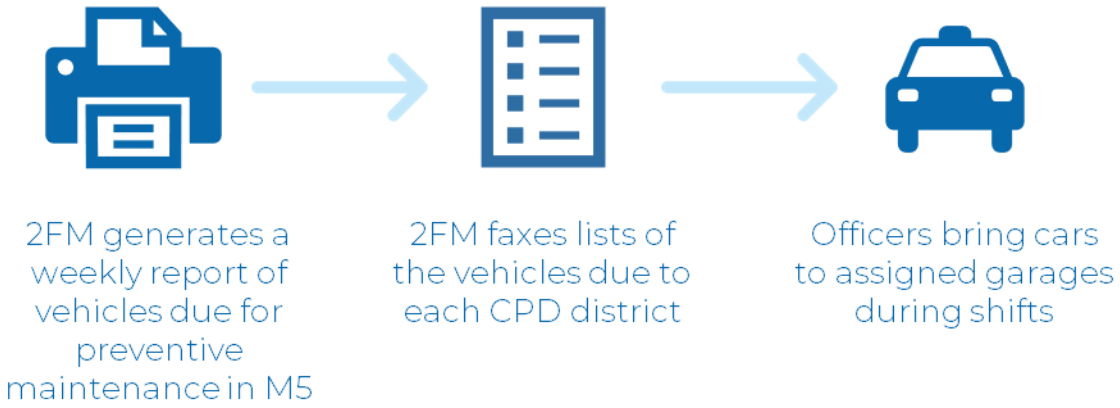
[2] OIG's analysis was based on mileage recorded in 2FM's fleet management system as of June 5, 2019. We excluded vehicles with no mileage recorded in the last three months. We also excluded leased vehicles and non-road vehicles, such as boats, Segways, golf carts, and all-terrain vehicles.
[3] United States General Services Administration, "GSA Internal Motor Vehicle Management 5620.1 ADM P," September 2005, accessed June 26, 2019, https://www.gsa.gov/directives-library/gsa-internal-motor-vehicle-management-56201-adm-p-extended.

repairs in a fleet management software called M5, using work orders to record the cost and duration of work performed.[4]

M5 uses fuel and mileage data collected each time a vehicle is fueled or receives service to automatically forecast when preventive maintenance should be performed. The program also flags as late vehicles that have not received preventive maintenance within 10% of due date, mileage, or fuel targets.[5] At the time of the audit, preventive maintenance was planned for most vehicles every 3,000 miles driven, 300 gallons of fuel used, or 90 days—whichever came first—and preventive maintenance was considered late after 3,300 miles, 330 gallons, or 99 days elapsed.[6] 2FM stated that it adjusted the forecasting model during the audit to allow up to 180 days between maintenance events to account for lower-usage vehicles. Timely preventive maintenance is important because it minimizes expensive repairs and maximizes the time a vehicle is available for use. Vehicles that do not receive regular preventive maintenance may require more frequent and complex repairs, resulting in increased downtimes.

Although M5 automatically forecasts when preventive maintenance is due, 2FM uses a manual process to pass the information on to CPD. Each week, 2FM management generates a report identifying all vehicles due for preventive maintenance. Management then faxes a request to each CPD unit, asking for specific vehicles to be brought to their assigned 2FM garage for service. Figure 4 below illustrates the notification process.

FIGURE 4: 2FM notifies CPD districts of vehicles due for preventive maintenance



Source: OIG visualization of process descriptions provided by 2FM.

[4] OIG attempted to calculate the annual cost of and number of work orders since 2008 but found 2FM's data was not sufficiently reliable.
[5] This is consistent with APWA's standard that calls for completion of at least 95% of preventive maintenance within 10% of the due date or usage targets.
American Public Works Association, *Top Ten Performance Measures for Fleet Managers* (Kansas City, MO: 2016), 6.
[6] Some vehicles have different targets for preventive maintenance. For example, large prisoner transport vehicles known as squadrols should receive maintenance every 400 gallons of fuel or 120 days. M5 forecasts when preventive maintenance should be performed based on the maintenance schedule for each type of vehicle.

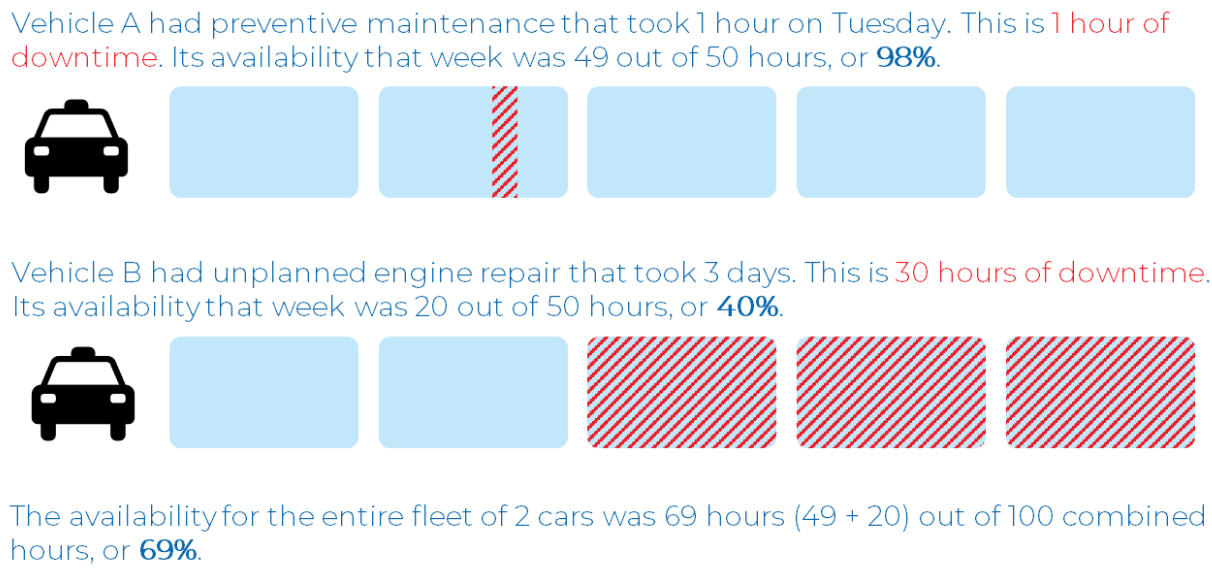
2FM performs preventive maintenance on CPD vehicles at its four light-duty garages. Each CPD unit is assigned a garage based on geographic proximity. 2FM primarily schedules preventive maintenance during daylight hours, because CPD is busier overnight. Three of the four garages are open 16 hours each weekday, while the fourth is open for 8 hours. All four garages are closed on Saturday and Sunday.

2FM told OIG that preventive maintenance generally takes 20 to 40 minutes to complete. However, this maintenance may reveal the need for repairs, which increases the time the car is unavailable for use. 2FM sends complex repair jobs to outside vendors to ensure the availability of garage space and staff for preventive maintenance and minor repairs. For example, vehicles seriously damaged in collisions are typically sent to outside body shops, because the repairs are time consuming and require specialized expertise. According to 2FM, performing these repairs at a 2FM garage could cause delays in preventive maintenance.

C. FLEET AVAILABILITY CALCULATION

"Fleet availability" is a performance measure that identifies the percentage of time a vehicle is available for use. It is calculated by dividing the time the vehicle is available by the time it should be available. Figure 5 illustrates the calculation, using an imaginary fleet of two vehicles, each of which should be available 50 hours per week.

FIGURE 5: How to calculate fleet availability



Source: OIG illustration of availability as described by the American Public Works Association.[7]

As illustrated in Figure 5, "downtime" is the amount of time that a vehicle necessary for operations is actually unavailable. Fleet agencies typically calculate the time a vehicle is available

[7] American Public Works Association, *Top Ten Performance Measures for Fleet Managers* (Kansas City, MO: 2016), 9-10.

by subtracting downtime from the amount of time the vehicle should have been available. Sources of downtime include scheduled preventive maintenance, unscheduled repairs, and roadside service. In addition, if a vehicle is unexpectedly removed from service due to a collision or malfunction, downtime is incurred until a replacement vehicle is allocated.

APWA considers fleet availability "the king of all fleet program performance measures," identifying 95% or better fleet availability as a generally accepted benchmark in the fleet management industry.[8] Fleet management agencies in New York, San Antonio, and Milwaukee set 95% fleet availability as their primary performance goal. 2FM told OIG that it generally agrees with this threshold and has used it in its own assessments.

[8] American Public Works Association, *Top Ten Performance Measures for Fleet Managers* (Kansas City, MO: 2016), 11. A similar statement appears in David N. Ammons, *Municipal Benchmarks: Assessing Local Performance and Establishing Community Standards* (New York: Routledge, 2015), 153.

III. FINDINGS AND RECOMMENDATIONS

FINDING 1: 2FM'S INACCURATE DATA PREVENTED IT FROM DETERMINING FLEET AVAILABILITY

OIG found that 2FM could not determine whether it met the industry standard of at least 95% availability because it lacked accurate data regarding when vehicles are unavailable and when they should be available.[9] As discussed in the background section, fleet availability is the percentage of time that vehicles are available for use. This is a critical performance measure, because it measures a fleet agency's success in achieving its primary objective—keeping vehicles on the road.

2FM had not maintained up-to-date information in M5 regarding what hours each vehicle was expected to be available for use, which is needed to calculate availability. As the operational department, CPD determines when a vehicle should be available based on its assignment. Although many CPD vehicles are assigned to units that operate 24 hours per day, other units operate on a more limited schedule. Therefore, CPD needs to update availability requirements when it reassigns vehicles. CPD staff do not have the access required to enter or update availability requirements in M5. Alternatively, CPD could provide availability requirements for 2FM to enter into M5, but 2FM has not requested this information.

In addition, 2FM's settings in M5 created inaccurate data regarding when some vehicles are unavailable—also known as downtime—which is needed to calculate availability. The method 2FM used to calculate downtime in M5 for work orders associated with its Fleet Service Center excluded some downtime hours. This understated downtime and overstated availability for work orders associated with the Fleet Service Center in M5.[10]

2FM also left some road service work orders open for months after the corresponding work had actually been completed, an error that resulted in the overstatement of total downtime. 2FM uses road service work orders to track short-duration services performed on vehicles in the field, such as charging a battery or replacing a headlight. 2FM management was unaware that its staff sometimes left road service work orders open for months because it omitted road service work orders from the weekly management report it used to identify work orders open for 30 days or longer. OIG reviewed all 28,023 unique work orders opened in 2017 and found that just 288 road service work orders accounted for 10.7% of the total reported downtime in M5.

[9] Top Ten Performance Measures for Fleet Managers, 2016 Revised Edition, American Public Works Association (APWA), (Kansas City, MO: 2016), 11.
[10] M5 lists 2FM's Fleet Service Center as the location of some towing work orders. These vehicles are typically towed to one of 2FM's four light-duty garages.

RECOMMENDATIONS

1. 2FM should ensure that M5 includes accurate and up-to-date information regarding when CPD vehicles should be available. This will allow 2FM to calculate availability of police vehicles based on CPD's operational need. To achieve this goal, 2FM should consider,
    a. developing, in collaboration with CPD, a method of automatically identifying in M5 when CPD vehicles should be available, based on factors such as type and unit assignment; or
    b. delegating authority and responsibility to CPD to enter and maintain this information in M5.
2. 2FM should ensure that downtime calculations in M5 reflect the entire time that the vehicle is out of service.
3. 2FM management should ensure that staff properly open and close work orders in M5. Steps could include updating relevant policies and procedures, training staff, and creating data input controls to make sure work order data entry errors are minimized.
4. 2FM should develop automatic alerts in M5 to notify staff when a work order has erroneously been left open. These alerts could include time parameters for specific job types that notify staff when work orders are open longer than expected. In addition, the regular work order aging reports reviewed by 2FM management should include open road service work orders.

MANAGEMENT RESPONSE

1. *"2FM agrees that unit availability information is critical in scheduling maintenance to minimize down time. However, an officer-to-vehicle ratio of approximately 3:1 necessitates that thousands of vehicles are effectively in use 24/7, which leaves no time for maintenance without affecting availability.*

    "Traditionally, spare pools have been established to allow for scheduled maintenance without impacting officer deployments. However, in recent years these spare pools have largely been absorbed by CPD into special functions & details.

    "That said, 2FM has been working with CPD and a 3rd party vendor (Clarity Partners) contracted with CPD for data warehousing. Data is provided daily to Clarity via data dumps. This data is converted to a dashboard that provides CPD with daily reports on the availably of CPD vehicles. This data is used to calculate fuel economy, miles driven between refueling, and shop down time.

    "With data transfers provided to Clarity, the data is converted to a dashboard that provides CPD with daily reports on the availability of CPD vehicles. This diminishes the manual typing of information. If additional information is warranted in M5, it can be

entered by 2FM personnel when the information is provided by CPD. This scenario allows 2FM to maintain the integrity of our database."

2. *"Shop hours of operation, including the Fleet Service Center, are being corrected to more accurately capture maintenance downtime in M5. In addition, 2FM is working with CPD to document vehicle hours of operation so that operational vs. maintenance downtime is accurately calculated to show the time that the vehicle is not available to CPD.*

   "Also, the Fleet Service Center's Equipment Availability Module is scheduled to come online in early 2020. This tool will provide for improved oversight of downtime."

   "However, a large portion of downtime results from vehicles that are in the shop for extended periods of time due to accident damage. In many cases, these vehicles also show as overdue for Preventive Maintenance, even though this work is not done until after the repairs are complete.

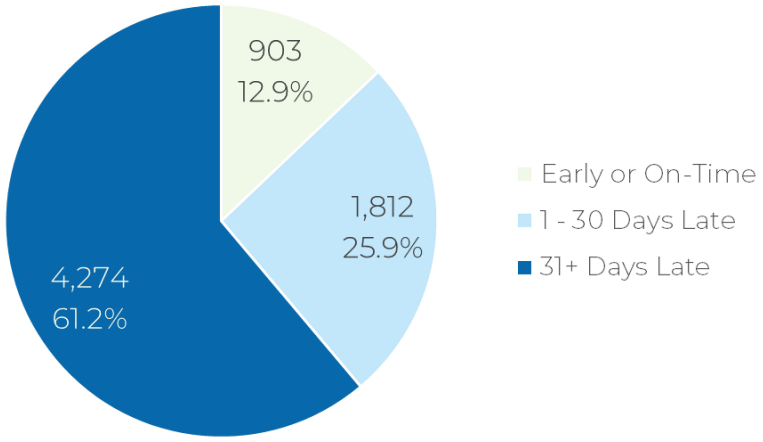
3. *"2FM works daily to ensure that the work orders are reviewed and completed prior to a vehicle being returned to the streets. This has been a standing policy to complete work orders before the using department is notified that their vehicle is ready. An issue relating to closing work orders generated by road service trucks was identified and corrected as a result of the audit."*

4. *"2FM has supplied our staff with various methods of electronically checking work orders. The work order review process needs to be done by a person. The M5 tools that are at the technicians', foremen's and managers' hands include the "Work Order Aging" report module, "Open Work Order" report module, and electronic 'dashboards' with work order status. In addition, an internal spreadsheet is distributed twice a week that tracks vehicles that have been down more than 30 days."*

FINDING 2: 2FM PERFORMED ONLY 12.9% OF PREVENTIVE MAINTENANCE ON TIME.

The APWA recommends performing at least 95% of preventive maintenance on time.[11] Improperly maintained vehicles are likely to have shorter lifespans, more unscheduled downtime for repairs, and more frequent and costly repairs. As described in the background section, M5 automatically flags preventive maintenance deadlines for each vehicle based on type, mileage, fuel, and time elapsed since the vehicle's last preventive maintenance. OIG determined that 2FM performed only 12.9% of preventive maintenance on time in 2017.[12] As shown in Figure 6, 2FM performed the majority of preventive maintenance more than 30 days late.

FIGURE 6: 61% of preventive maintenance was performed more than 30 days late

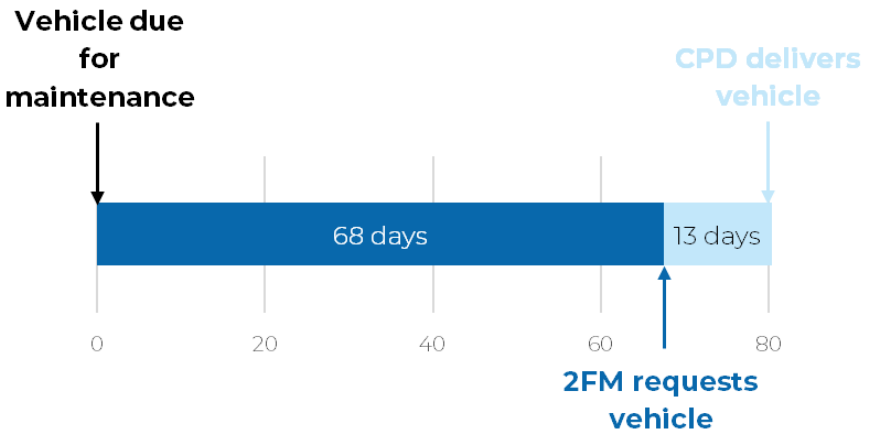


Source: OIG visualization of 2FM preventive maintenance data.

As discussed in the background section, 2FM manually requests specific vehicles on a weekly basis via fax. OIG reviewed the requests sent to 9 CPD districts from July to October 2018 and found that 2FM requested vehicles an average of 68 days after their maintenance due dates. CPD delivered the vehicles to 2FM garages an average of 13 days after receiving the requests. Figure 7 illustrates the portions of the delay attributable to 2FM and CPD.[13]

[11] As described in the background section, both APWA and 2FM allow a 10% buffer before considering the maintenance late. American Public Works Association, *Top Ten Performance Measures for Fleet Managers* (Kansas City, MO: 2016), 6.
[12] We excluded "Overdue" and "WIP-Late" records from our analysis because we determined the data was not reliable. A small number of preventive maintenance records in M5 for this time period (121, or 1.7% of the total) were classified as "Overdue" or "WIP-Late," meaning that they are beyond the 10% late threshold, but have not been completed as of the date they are queried in M5. We determined that at least some of these records resulted from data management errors, such as continuing to forecast preventive maintenance on decommissioned vehicles.
[13] Appendix A provides detail on average delays in each of the nine districts.

FIGURE 7: 84% of preventive maintenance delays in 9 districts were attributable to late requests from 2FM[14]



Source: OIG visualization of M5 data and maintenance request logs provided by 2FM.

2FM told OIG that it intentionally delayed requests to avoid depleting the districts of vehicles. As a result, 2FM did not perform preventive maintenance on time, creating a backlog. There are over 3,000 vehicles in the CPD fleet that require maintenance at least 4 times per year, meaning that 2FM should perform preventive maintenance at least 12,000 times per year (or 50 times per day). In 2017, 2FM performed preventive maintenance 6,964 times, for an average of 29 times per day. 2FM stated that it did not think it had the capacity to accommodate an additional 21 preventive maintenance events per day, although it had not conducted an analysis of its staffing or the physical capacity of its garages.

2FM is working on an upgrade to M5 that will improve communication with CPD by automatically notifying its units when vehicles are due for preventive maintenance. This upgrade will allow CPD to prioritize the delivery of vehicles and reduce the potential for error inherent in a manual process. 2FM is concerned that these automatic notifications may be missed if CPD unit management does not assign specific individuals the responsibility of reviewing them and coordinating delivery of vehicles to 2FM. Ideally, these concerns would be discussed during regular meetings of the Interagency Police Vehicle Committee, which includes representatives from the Fraternal Order of Police (FOP), CPD, 2FM, and the Office of Budget and Management (OBM). The City and FOP created the committee by mutual agreement in 2014 to discuss purchase, maintenance, and retirement of police vehicles. However, the committee has not met since September 2017. See Appendix B to read the full agreement between the City and FOP.

RECOMMENDATIONS

1. 2FM should perform at least 95% of preventive maintenance on time, as recommended by APWA. To achieve this goal, 2FM should:

[14] Note that the nine CPD districts OIG examined in this analysis report to only two of 2FM's four garages that service CPD vehicles. A full analysis of all 22 CPD districts over a longer time period may yield different results.

a. Analyze its operations to determine if process improvements could boost its preventive maintenance performance rate; then

b. Determine if additional capacity—both personnel and facilities—is needed to achieve the goal. 2FM should use this analysis to inform future decision-making related to preventive maintenance, including operating and capital budget requests.

2. To improve its communication with CPD regarding the police fleet, 2FM should:

   a. Inform CPD, on at least a weekly basis, of all vehicles that are due or past due for maintenance. 2FM could accomplish this by initiating automatic notifications via M5 to allow CPD to coordinate delivery of vehicles for preventive maintenance.

   b. Discontinue the practice of limiting the number of vehicles requested each week and inform CPD of which vehicles are longest overdue so that they can be prioritized.

   c. Resume regular meetings of the Interagency Police Vehicle Committee with CPD and OBM.

MANAGEMENT RESPONSE

1. *"2FM agrees that a 95% on time maintenance target should continue to be the goal. However, this target is largely unattainable until two additional APWA recommendations are implemented:*

   a. *"Replacing front line patrol vehicles based on the APWA scoring guideline (Note: This would require approximately 3x the funding for police vehicle purchases); Note that newer vehicles, in addition to being more reliable, require less maintenance.*

   b. *"Staffing garages adequately to keep up with work load demand. 2FM performed a manpower analysis that shows that the garages would need an increase in technicians of 20%. Note that these studies have been used to rebalance 2FM's workforce to optimize productivity."*

2. *"2FM has been working closely with CPD and has established that all vehicle concerns are centralized through their Bureau of Technical Services (Fleet Liaisons office). In doing so CPD revised various vehicle directives, established PM compliance monitoring and reporting. The bureau will now hold the districts accountable for PM compliance and work with 2FM concerning any vehicle schedules or issues. 2FM tracks and reports weekly on CPD's PM compliance. PM schedules for the upcoming week are now report generated and electronically sent to the liaison's office. CPD takes that information and notifies the districts and units with their scheduled date for Preventive Maintenance including their assigned maintenance location.*

"Email notifications sent electronically are programmed one at a time by M5 which overload mailboxes occasionally. 2FM is looking for an electronic way for M5 to automatically send batched information for PM notifications. 2FM will be working with members to find solutions for batched emailed notifications. Note that the upgrade from M4 to M5 in 2017 provided several new features, which 2FM is continually implementing to improve operations.

"With PMs scheduled through the CPD liaisons office they have the flexibility to work through their operational needs while meeting PM compliance requirements and hold their districts accountable.

"2FM has re-evaluated the PM calendar time interval between oil changes from 90 days to 180 days, provided the 3000-mile limit is not reached. This change, which is in line with manufacturer recommendations, has allowed 2FM to focus more on high mileage vehicles, and eliminate unnecessary oil changes and resulting backlogs.

"As a result of coordinating with the CPD Liaison's Office and moving to a dynamic PM process per manufacturer recommendations, backlog has been reduced by over 40%.

"2FM is in contact with CPD Fleet Liaisons daily. On 8/29/19, 2FM re-initiated monthly meetings with CPD to discuss any current and upcoming issues, and will invite FOP and OBM to subsequent meetings."

IV. OBJECTIVES, SCOPE, AND METHODOLOGY

A. OBJECTIVE

The objective of the audit was to determine if 2FM achieved at least 95% fleet availability for CPD vehicles.

B. SCOPE

Our examination of availability considered all work orders for CPD vehicles opened during 2017. Our evaluation of preventive maintenance included all CPD vehicles scheduled to receive preventive maintenance in 2017, except for boats, trailers, all-terrain vehicles, and golf carts. We also reviewed preventive maintenance requests from August through October 2018 for nine CPD districts to determine the source of delays.

The audit did not assess the impact of CPD operational decisions on fleet availability or the Office of Emergency Management and Communications' management and repair of equipment installed in CPD vehicles.

C. METHODOLOGY

To assess whether 2FM achieved the industry standard of at least 95% fleet availability, we attempted to compare vehicle downtime to the amount of time vehicles should be available to meet operational needs. We determined that downtime and availability data were not sufficiently reliable to address the original audit objective. We found data inaccuracies by looking for outliers and data that did not match 2FM's description of its process. We then interviewed 2FM staff, including its senior database analyst, regarding the source of inaccurate data.

To determine whether 2FM performed preventive maintenance on time, we compared the actual date that maintenance was performed to the last on-time date forecast by M5. To determine whether 2FM performed an adequate volume of preventive maintenance, we compared the number of maintenance work orders completed in 2017 to the minimum number of maintenance work orders that would have been needed to meet the needs of the CPD fleet.

To assess the reliability of preventive maintenance data, we reviewed preventive maintenance data for logical mismatches, such as decommissioned cars that were still listed as due for maintenance. Where questions arose, we examined individual vehicle records to confirm the existence of inaccuracies, and consulted with 2FM's senior database analyst to confirm our interpretations of the data. We determined that preventive maintenance requests marked as "Overdue" or "WIP-Late" related to many vehicles that had been decommissioned and should not have been requested for maintenance. Therefore, we removed 116 records marked as "Overdue" or "WIP-Late" from the total of 6,964 records. We also examined the risk that 2FM performed, but did not record, preventive maintenance while a vehicle was in the garage for repair. We determined that 2FM routinely records preventive maintenance for vehicles that are

in the garage for repair. Therefore, we determined that preventive maintenance data were sufficiently reliable for use in this analysis.

To determine the cause of delayed preventive maintenance, we compared the requests sent to nine CPD districts between July and October of 2018 to the maintenance schedule for each vehicle in M5. This allowed us to compare the date a vehicle became due for maintenance, the date it was requested, and the date the maintenance was performed. This sample of requests should not be considered representative of all requests, as it was a nonrandom sample from 9 of 22 CPD districts.

D. STANDARDS

We conducted this audit in accordance with generally accepted Government Auditing Standards issued by the Comptroller General of the United States. Those 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 provides a reasonable basis for our findings and conclusions based on our audit objectives.

E. AUTHORITY AND ROLE

The authority to perform this audit is established in the City of Chicago Municipal Code § 2-56-030 which states that OIG has the power and duty to review the programs of City government in order to identify any inefficiencies, waste, and potential for misconduct, and to promote economy, efficiency, effectiveness, and integrity in the administration of City programs and operations.

The role of OIG is to review City operations and make recommendations for improvement.

City management is responsible for establishing and maintaining processes to ensure that City programs operate economically, efficiently, effectively, and with integrity.

APPENDIX A: AVERAGE PREVENTIVE MAINTENANCE DELAYS IN 9 CPD DISTRICTS, JULY THROUGH OCTOBER 2018

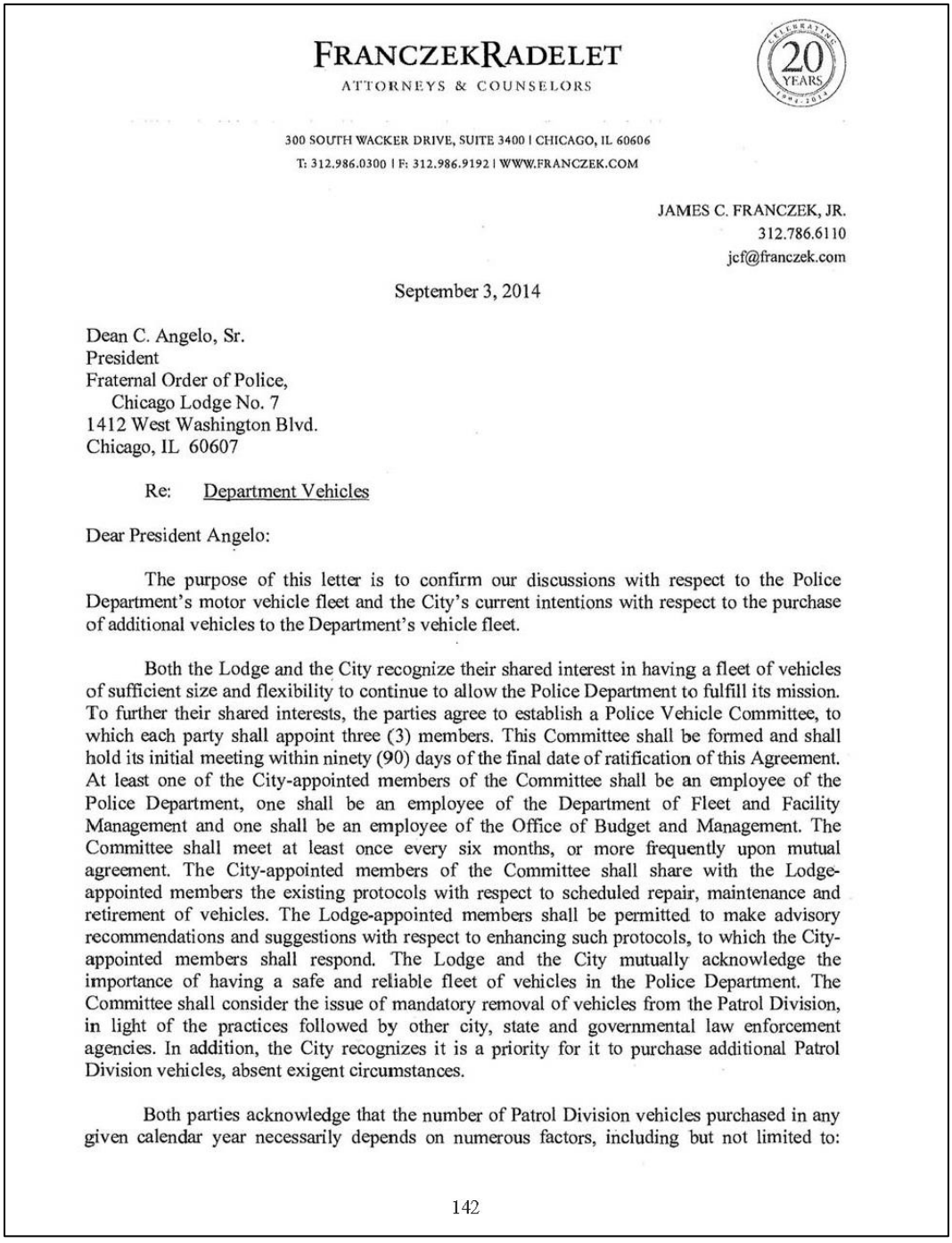
The table below shows the distribution of delayed preventive maintenance across nine police districts.

	2FM's Responsibility		CPD's Responsibility		
CPD District	Days Elapsed from Due Date to Request	**% of Time Before 2FM Sent Request**	Days Elapsed from Request to Completion	**% of Time Between Request and Completion**	Due Date to Completion (Total Days)
3	60	**80.6%**	15	**19.4%**	75
4	74	**79.9%**	19	**20.1%**	92
5	50	**73.5%**	18	**26.5%**	67
6	68	**78.6%**	19	**21.4%**	87
7	92	**95.5%**	4	**4.5%**	96
8	123	**84.2%**	23	**15.8%**	146
12	70	**86.3%**	11	**13.7%**	81
15	50	**87.4%**	7	**12.6%**	57
22	53	**86.6%**	8	**13.4%**	61
Average	68	**84.0%**	13	**16.0%**	**80**

Source: OIG analysis of M5 data and maintenance request logs provided by 2FM.

APPENDIX B: INTERAGENCY FLEET COMMITTEE AGREEMENT

The letter below, which is part of the collective bargaining agreement between the City and FOP, documents the agreement to create an Interagency Fleet Committee.



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September 3, 2014

Dean C. Angelo, Sr.
President
Fraternal Order of Police,
Chicago Lodge No. 7
1412 West Washington Blvd.
Chicago, IL 60607

Re: Department Vehicles

Dear President Angelo:

The purpose of this letter is to confirm our discussions with respect to the Police Department's motor vehicle fleet and the City's current intentions with respect to the purchase of additional vehicles to the Department's vehicle fleet.

Both the Lodge and the City recognize their shared interest in having a fleet of vehicles of sufficient size and flexibility to continue to allow the Police Department to fulfill its mission. To further their shared interests, the parties agree to establish a Police Vehicle Committee, to which each party shall appoint three (3) members. This Committee shall be formed and shall hold its initial meeting within ninety (90) days of the final date of ratification of this Agreement. At least one of the City-appointed members of the Committee shall be an employee of the Police Department, one shall be an employee of the Department of Fleet and Facility Management and one shall be an employee of the Office of Budget and Management. The Committee shall meet at least once every six months, or more frequently upon mutual agreement. The City-appointed members of the Committee shall share with the Lodge-appointed members the existing protocols with respect to scheduled repair, maintenance and retirement of vehicles. The Lodge-appointed members shall be permitted to make advisory recommendations and suggestions with respect to enhancing such protocols, to which the City-appointed members shall respond. The Lodge and the City mutually acknowledge the importance of having a safe and reliable fleet of vehicles in the Police Department. The Committee shall consider the issue of mandatory removal of vehicles from the Patrol Division, in light of the practices followed by other city, state and governmental law enforcement agencies. In addition, the City recognizes it is a priority for it to purchase additional Patrol Division vehicles, absent exigent circumstances.

Both parties acknowledge that the number of Patrol Division vehicles purchased in any given calendar year necessarily depends on numerous factors, including but not limited to:

142

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available funding; the needs for other categories of Police Department vehicles, such as canine unit vehicles, squadrols, van cell cargo vans, prisoner transport vehicles and unmarked vehicles; and the parameters of multi-year purchase schedules, which may make it more (or less) economical to purchase vehicles in a particular sequence or time frame. Subject to these caveats, the City has represented to the Lodge its intention to purchase four hundred (400) vehicles for the Police Department before the close of 2014 and has advised the Lodge of its intention to purchase, on average, two hundred (200) Patrol Division vehicles each year during the term of this Agreement, beginning in 2015. During the first quarter of each calendar year beginning in 2015, the Committee shall meet and the City shall share with the Lodge-appointed Committee members its progress in attaining this goal. In any year where the City does not reach this goal, upon request the City-appointed members shall meet with the Union-appointed members to discuss the reason(s) for not attaining the goal.

Your acknowledgement and agreement is appreciated in the space provided below.

Very truly yours,

James C. Franczek, Jr.

AGREED:

Dean C. Angelo, Sr.

143

MISSION

The City of Chicago Office of Inspector General (OIG) is an independent, nonpartisan oversight agency whose mission is to promote economy, efficiency, effectiveness, and integrity in the administration of programs and operations of City government. OIG achieves this mission through,

- administrative and criminal investigations by its Investigations Section;
- performance audits of City programs and operations by its Audit and Program Review Section;
- inspections, evaluations and reviews of City police and police accountability programs, operations, and policies by its Public Safety Section; and
- compliance audit and monitoring of City hiring and employment activities by its Hiring Oversight Unit.

From these activities, OIG issues reports of findings and disciplinary and other recommendations,

- to assure that City officials, employees, and vendors are held accountable for violations of laws and policies;
- to improve the efficiency and cost-effectiveness of government operations; and
- to prevent, detect, identify, expose, and eliminate waste, inefficiency, misconduct, fraud, corruption, and abuse of public authority and resources.

AUTHORITY

OIG's authority to produce reports of its findings and recommendations is established in the City of Chicago Municipal Code §§ 2-56-030(d), -035(c), -110, -230, and 240.

Cover image courtesy of iStock.

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TO SUGGEST WAYS TO IMPROVE CITY GOVERNMENT, VISIT:
IGCHICAGO.ORG/CONTACT-US/HELP-IMPROVE-CITY-GOVERNMENT

TO REPORT FRAUD, WASTE, AND ABUSE IN CITY PROGRAMS:
CALL OIG'S TOLL-FREE TIP LINE: (866) 448-4754 / TTY: (773) 478-2066

OR VISIT OUR WEBSITE
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