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Report of the Office of Inspector General:

Chicago Fire Department Fire and Medical Incident Response Times Follow-Up Inquiry

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March 2015

866-IG-TIPLINE (866-448-4754) www.chicagoinspectorgeneral.org

Joseph M. Ferguson Inspector General

OFFICE OF INSPECTOR GENERAL

City of Chicago

740 N. Sedgwick Street. Suite 200 Chicago, Illinois 60654 Telephone: (773) 478-
7799 Fax: (773) 478-3949

March 3, 2015

To the Mayor, Members of the City Council, City Clerk, City Treasurer, and residents of the City of Chicago:

The City of Chicago Office of Inspector General has completed a follow-up to its October 2013 audit of the Chicago Fire Department's (CFD) fire and medical incident response times. OIG concludes that CFD has not implemented corrective actions related to the original findings.

The purpose of the 2013 audit was to determine if CFD fire and medical response times met National Fire Protection Association (NFPA) Standard 1710, which CFD historically claimed it met or exceeded.

Our audit found that CFD did not meet the NFPA standard and that CFD's internal reports lacked the elements necessary to accurately assess whether the Department was in fact meeting or exceeding the national standards as it claimed publicly.

Based upon the results of our audit, we recommended that CFD,

- formally document its response time goals, per NFPA 1710 4.1.2;
- suspend all internal and external reporting that states it is in compliance with NFPA 1710 until such time as it conducts analysis to determine if at least 90% of responses meet the response time goals;
- conduct analysis by ward or community area to determine if its equipment and personnel are positioned appropriately to meet target response times across the city;
- update its policies and procedures to specify the point at which the responding company's status should be updated either by radio or Fire Mobile Data terminal;
- continuously monitor the number of blank and inaccurate time fields in the Computer Aided Dispatch (CAD) system and work toward achieving 100% completeness and accuracy in all data fields;
- conduct a thorough data-based analysis to identify causes that are preventing it from meeting the national response time goals and ways to improve its operational efficiency;
- create and implement an action plan that will ensure verifiable compliance with NFPA 1710 standards, or conduct a study to determine if the unique characteristics of the city prevent it from meeting the response time goals contained in NFPA 1710 and, based upon that study, choose other response time goals; and

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- evaluate turnout and travel time separately from total response time to better identify and understand areas that need improvement as well as to be in compliance with NFPA 1710.

In October 2014, OIG inquired with CFD regarding the current status of any corrective actions taken by the Department in response to the original audit. This follow-up report summarizes the four original audit findings, recommendations, and status of corrective actions, as described by CFD.

Based on CFD's follow-up responses, OIG concludes that CFD does not intend to implement any corrective actions related to the original findings, which were based on standards of NFPA¹ and the Commission on Fire Accreditation International (CFAI).² We maintain, as we stated in the October 2013 audit report, that documenting performance goals and accurately assessing performance outcomes are basic and critical management functions. Therefore, we again urge CFD to consider tracking and analyzing performance according to the standards put forth by NFPA and CFAI in order to foster public confidence that it is providing optimal service and making best use of valuable taxpayer resources.

CFD's acknowledgement that "CAD data are not designed to provide a complete and accurate picture of CFD response times" is contradictory to its assertion that CAD data calculations provide "an adequate measure of performance." CFD did invite OIG to analyze additional non-CAD data. However, as long as CFD continues to use CAD data to measure performance, we would not expect such an analysis to change our recommendations.

We thank CFD for its cooperation during both the original audit and the follow-up inquiry.

Respectfully,

Joseph M. Ferguson Inspector General
City of Chicago

The National Fire Protection Association describes itself as "the world's leading advocate of fire prevention." NFPA, "About NFPA," accessed January 30, 2015, <<http://www.nfpa.org/about-nfpa>>.

² CFAI accreditation is based on a model created by "a task force of highly qualified and dedicated chief fire officers, trainers, city/county administrators, and academic professionals." Center for Public Safety Excellence, "About Accreditation and CFAI," accessed January 30, 2015, <<http://publicsafetycexcellence.org/agency->accreditation/about-accreditation-cfai.aspx>>.

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CFD Fire and Medical Incident Response Times Follow-Up Inquiry

Follow-Up Results

In October 2014, the City of Chicago Office of Inspector General (OIG) followed up on an October 2013 audit of the Chicago Fire Department's (CFD) fire and medical incident response times.³ We have summarized the four original findings, their associated recommendations, and the status of any corrective actions below. We have also directly quoted CFD's replies to our inquiry regarding each corrective action and provided our own response. OIG's follow-up inquiry did not observe or test implementation of any new procedures described and thus makes no determination as to their effectiveness, which would require a new audit with full testing of the procedures.

FINDING 1: CFD Does Not Have Documented Response Time Goals

OIG Recommendation 1: We recommended that CFD formally document its response time goals, per NFPA 1710 4.1.2.

Status of Corrective Action: Not Implemented. "For fire suppression response, for the public safety reasons described in CFD's original response, the CFD does not set or document specific goals with regards to its response times. The CFD stressed that it does not want to

encourage reckless behavior to meet an arbitrarily set time goal such as NFPA, absent a legal requirement. The CFD has and will continue to use the NFPA response time guidelines as a tool for comparison only.

"For [Emergency Medical Services (EMS)] response, the CFD is committed to responding within 6 minutes, which is the standard set by the Illinois Department of Public Health. "

OIG Response:

OIG maintains that, per the NFPA 1710 standard, CFD should formally document its fire suppression response time goals as well as its fracture measurement goals to assess how often it meets response time goals. While NFPA 1710 is not a legal requirement, it is based on "research work and empirical studies in North America"⁴ and is followed by many cities across the country including Los Angeles, Houston, Dallas, San Francisco, and Boston.

We also maintain that, per the NFPA 1710 standard, CFD should document fracture measurement goals to assess how often EMS

³ The October 2013 audit report is available on the OIG website: [hUp://chicagoinpectorucnral.ora/wp-content/uploads/2013/10/CFD-Response-Time-Audit-Report.pdf](http://chicagoinpectorucnral.ora/wp-content/uploads/2013/10/CFD-Response-Time-Audit-Report.pdf).

⁴ NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, 2010 Ed. (USA, National Fire Protection Association, 2010), 1710-1, 1710-7.

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responses comply with its six-minute response time goal. Such monitoring of response times is necessary for CFD to effectively manage the City's EMS resources.

Finding 2:

CFD's Analysis Does Not Allow the Department to Determine Its Compliance with National Standards

OIG Recommendation 2.1: We recommended that CFD suspend all internal and external reporting that states it is in compliance with NFPA 1710 until such time as it conducts analysis to determine if at least 90% of responses meet the response time goals. Such an evaluation should be done annually, as recommended in NFPA 1710 4.1.2.5.

Status of Corrective Action: Not Implemented. "The CFD has not reported that it is in full compliance with NFPA 1710 since the audit report was made and the issue was brought to our attention. [...]"

"Due to the large number of each week's sample size, the CFD continues to believe that averages are an adequate measure of performance. If the average fluctuates significantly, the CFD takes a closer look at the events of the week, running event queries, pulling two-way traffic and looking at 'after event' documentation to investigate the cause of any outlier response times. "

OIG Response:

We maintain that CFD should analyze its performance in a way that determines if at least 90% of responses meet response time goals, per the NFPA standard. The Commission on Fire Accreditation International, an internationally-recognized organization committed to improving fire and emergency services, specifically states, "For nearly 50 years, fire agencies have been talking about their average response time. This is an inadequate statistical reference." ⁵ They further stated that "averaging was not a true reflection of performance." Instead, CFAI recommends that fire departments use fractile goals, where the goal is that a percentage of response times meet a time objective, thus keeping outliers from skewing the results.

The use of an average response time to measure performance equates to declaring overall success without determining the failure rate. As an example, assume a hypothetical fire department adopted the NFPA response time goal of five minutes and twenty seconds (the black vertical line in the graph below) and completed 100 fire responses in an average of four minutes (the blue vertical

⁵ Commission on Fire Accreditation International, Inc., "Creating and Evaluating Standards of Response Coverage For Fire Departments," 4th ed. (Chantilly, VA: 2003), ch. 5 p. 10, accessed January 30, 2015, <<http://www.riskinstitute.org/peri/images/file/cfaimaiiual.pdf>>.

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1.00 1.50 2.00 3.00 3.50 4.00 5.00 5.50 6.00 6.50 7.00 7.50 8.00 9.00
Response Time (Minutes)

Averages alone are inadequate measures of performance because they fail to reveal the distribution of performance events in relationship to a goal. Fractile measurements provide a more complete picture of performance by identifying how often a goal was met and thus facilitating identification and analysis of those times the goal was not achieved.

OIG Recommendation 2.2: We recommended that the analysis be conducted by ward or community area so the Department can determine if its equipment and personnel are positioned appropriately to meet target response times across the city.

Status of Corrective Action: Not Implemented. "In its original response, the CFD offered a detailed explanation of why it does not use political boundaries for any response time analysis. The CFD sustains this position. The CFD's firehouses are laid out in a manner that gives each firehouse a first due response or 'still district' response area, with a dynamic network of expanding and contracting coverage responsibilities that is based on several factors. Neighborhood/ward boundaries are not factored in the dispatching of CFD equipment and resources in any way. A department M'ith greatly unequal distances to certain areas may benefit from using community boundaries for a response report. However this is not the case in Chicago, where 99 percent of residential, homes are located within two (2) miles of a CFD firehouse. Radius maps for each engine and truck were provided to show this effect.

"The CFD's main priority is to respond quickly and safely to the individual who is calling 9-1-1 for assistance regardless of the

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neighborhood/ward that individual resides in. The CFD remains committed to protecting all people, in every neighborhood in Chicago, and to ensuring that it has the trust and confidence of every community in Chicago. "

OIG Response:

In our original audit, we analyzed response times by ward and community area, and found that response times varied across the City. Therefore, we maintain that CFD should perform an analysis of response times by geographic area, not just rely on the proximity of residences to firehouses, in order to meet its stated goal of "protecting all people, in every neighborhood in Chicago, and ensuring that it has the trust and confidence of every community in Chicago." CFD stated their concern about the use of political boundaries, such as wards, in its analysis; however, the Department could instead analyze its response times using non-political boundaries, such as community areas, neighborhoods, or still districts.⁶

Finding 3: Not All Incidents Have Complete and Accurate Time Data

OIG Recommendation 3.1: We recommended that CFD update its policies and procedures to specify the point at which the responding company's status should be updated either by radio or Fire Mobile Data terminal.

Status of Corrective Action: Not Implemented. "The CFD's policy on the use of the radio (or the terminal) to provide status updates has not changed. The CFD provides ongoing training and staff development to instruct its company officers and members on the proper operation of the mobile data computer and sends periodic training bulletins to this effect. As a part of its regular training, members are advised to use the buttons to report change in status, be it in 'en route', 'on scene', or 'back in quarters'. But the fact remains that the CAD system is designed to address 'status' and not be a database for detailed audits on a 'company by company' comparison or other analysis where precise time reporting is required. "

OIG Response:

During the original audit, CFD informed OIG that there were no policies on the exact time firefighters should press the en route

⁶ In Chicago, "Community Areas" refer to specific geographic locations created by the City's Department of Public Health and the University of Chicago's Local Community Research Community in 1920. These areas are apolitical and are used for Census tracking and academic research. These boundaries have not changed substantially in nearly a century.

"Spatially Referenced Census Data for the City of Chicago: Sources Available at or through the University of Chicago Library" The University of Chicago, accessed December 10, 2014. <<http://www.lib.uchicago.edu/e/collections/maps/censusinfo.html>>

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button and, thus, capture that time in the CAD data. We maintain that, because CFD asserts that CAD data is used to assess its performance, the Department should update its policies to ensure the completeness and accuracy of the data.

OIG Recommendation 3.2: We recommended that CFD continuously monitor the number of blank and inaccurate time fields and work toward achieving 100% completeness and accuracy in all data fields.

Status of Corrective Action: Not Implemented. "The CFD explained to the original audit team that CAD data are not designed to provide a complete and accurate picture of CFD response times. Missing fields of data in the CAD are often due to circumstances out of CFD control, including the limitations of the propagation paths that exist in the city for ultra-high frequency (UHF) radio communication. No change in policy can improve on that limitation. The two-way radio continues to be the most reliable method to send or receive information about the location of a vehicle, and retroactively duplicating that information on the CAD is not essential to the CFD's mission. For that reason, the CFD continues to audit outlier response times by reviewing CAD data along with two-way radio traffic, event queries, and action reports. "

OIG Response: We maintain that, because CFD asserts that CAD data is used to assess its performance, the Department should ensure the completeness and accuracy of the data. Furthermore, by acknowledging that its data is incomplete and inaccurate, CFD undermines its own claim in the response to Finding 2 above, that averages calculated from CAD data are an adequate measure of performance.

Finding 4: CFD Is Not Meeting National Standards for Response Time Citywide

OIG Recommendation 4.1: CFD expressed concerns regarding any recommendation that would encourage fire and EMS companies to drive faster in order to decrease response time. We agreed with the Department that such a recommendation is not appropriate. However, other operational factors could be contributing to increased response times such as a lack of ambulances and paramedics, location of fire houses, or aging equipment. Therefore, we recommended that CFD conduct a thorough data-based analysis to identify causes that are preventing it from meeting the national response time goals and ways to improve its operational efficiency. Additionally, to the extent the Department intends in the future to use NFPA 1710 as a performance standard and benchmark, we recommended the

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Department immediately create and implement an action plan that will ensure verifiable compliance with NFPA 1710 standards.

Alternatively, CFD could conduct a study to determine if the unique characteristics of the city prevent it from meeting the response time goals contained in NFPA 1710 and could choose other response time goals. The Department should then perform an annual analysis of incidents to determine if it is meeting the alternative goals.

Status of Corrective Action: Not Implemented. "While the CFD had not set specific goals for response times for the public safety reasons described above, the department does conduct regular reviews of response times through which any issues with response times and the conditions causing those issues are identified and addressed. With regards to EMS response times, the CFD has recently converted all of its 15 basic life support ambulances to advanced life support. As part of this program change, the CFD is mandated to monitor the response times of the ambulances to ensure that there is no adverse impact on EMS response times, and report back to the Illinois Department of Public Health in six (6) months from the inauguration of the program.

"The CFD reviews its response reports on a bi-monthly basis with a year-end review annually. If the OIG would like to review, the CFD would be pleased to provide these reports.

"In most fire departments, EMS response does not have its personnel wearing the same equipment or using the same vehicles as a suppression response and thus, they should be able to clear the firehouse faster since they do not have as much gear to put on. However, in Chicago, the response gear and vehicles are identical for fire suppression and EMS, when using engines and trucks. To accommodate larger departments like Chicago, the NFPA standards are flexible and allow the longer fire suppression time frame in measuring EMS turnout times.

OIG Response:

CFD did not meet national standards at the time of the original audit and has taken no steps to address this issue since. We recommend that the Department either use NFPA standards to measure performance and develop and implement an action plan to ensure verifiable compliance with NFPA, or conduct a study to determine appropriate response times and set and document response time goals.

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OIG Recommendation 4.2: Finally, we recommended the Department evaluate turnout and travel time separately from total response time to better identify and understand areas that need improvement as well as to be in compliance with NFPA 1710.

Status of Corrective Action: Not Implemented. "To provide a useable data set for turnout and travel, as separate functions, would require a passive/active system that would have to record several parameters not captured by CAD, including:

- *Tracking of the actual internal alarm time of the 'bells' for each type of run for each apparatus in every firehouse;*
- *Tracking of individual members as they enter and become seated in each rig of each firehouse; and*
- *Passive devices to show the precise time an apparatus exits the firehouse and account for lane changes within the house, automatically signaling to OEMC as to the end of turnout time and the start of travel time within plus/minus one (1) or two (2) seconds.*

"In addition, a traffic control system would have to be investigated to allow outside signals to stop approaching traffic to allow the response vehicles to enter traffic flow. In some firehouses, CFD personnel manually stop traffic in order to get the rig out of the house, which can alter turnout/travel times.

"The department does not believe that implementing new and complex systems to capture these parameters is a priority for public safety. Total response time, from alarm to arrival, is the critical measure for purposes of public safety, and the CFD uses this measure to look for areas of concern. Any issues in turnout would disclose itself in total response time data. "

OIG Response:

CFD stated in its response to Recommendation 3.1 that firefighters "are advised to use the buttons to report change in status, be it in 'en route,' 'on scene,' or 'back in quarters.'" [Emphasis added.] OIG asserts that the complex systems described by CFD above are not necessary to capture the turnout and travel times separately. Rather, CFD needs only to analyze that data that it has advised firefighters to capture to determine whether it meets the NFPA standard. Therefore, we maintain that the Department should evaluate turnout and travel time separately from total response time to better identify and understand areas that need improvement as well as to be in compliance with NFPA 1710. Such an analysis could assist CFD in identifying whether delays are acceptable or could be prevented through infrastructure and resource investment.

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City of Chicago Office of Inspector General

Public Inquiries

Rachel Leven (773) 478-0534
rlevenfajchicagoinspectorgeneral.org

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