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Understanding the City of Chicago's Response to Sewer Cave-in Complaints: An Explainer

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Acronyms

BOD	Bureau of Operations and Distribution
DWM	Department of Water Management
OEMC	Office of Emergency Management and Communications
OIG	City of Chicago Office of Inspector General
SLA	Service level agreement

The Department of Water Management (DWM) is responsible for maintaining the integrity of Chicago's water and sewer system. When Chicagoans notice "sinkholes" or other road issues, they sometimes report them to Chicago's 311 system—the City's system for registering public complaints and requests for City services—as "sewer cave-ins."[1] However, the 311 system does not always provide enough information for a complainant to follow and understand the subsequent steps taken by DWM. With this report, the Office of Inspector General (OIG) aims to provide Chicagoans with basic information about sewer cave-ins, the City's 311 system, and DWM's response to this type of complaint.

I | Understanding Sewer Cave-ins

The City of Chicago's sewer system comprises approximately 4,500 miles of sewers, 205,000 collection structures, and 146,000 manholes.[2] Many of the sewers were built in the late 1800s and need to be either replaced or relined periodically to maintain their structural integrity.[3]

Sewer infrastructure can weaken or break due to age and use. This deterioration may lead to sewer cave-ins. A cave-in takes the form of sunken pavement near a drain, manhole cover, or sewer grate, or a hole in a road which lays over a sewer. Although cave-ins can look similar to potholes, and are sometimes described with the similar term "sinkholes," they are actually caused by problems underneath a road surface.

[1] DWM staff, City Council members, and other City staff also use the 311 system to report sewer cave-ins.
[2] City of Chicago Office of Budget and Management, "2021-2025 Five Year Capital Improvement Program," February 25, 2021, 130-131, accessed December 14, 2023, https://www.chicago.gov/content/dam/city/depts/obm/general/CIP/CIPDocs/CIPBooks/2021-2025CIPBookFinal.pdf.
[3] Rather than replacing aging sewers, DWM can reline sewers using "cured-in-place and geopolymer lining technologies" to "improve the structural integrity without excavation." City of Chicago Office of Budget and Management, "2021-2025 Five Year Capital Improvement Program," February 25, 2021, 131, accessed December 14, 2023, https://www.chicago.gov/content/dam/city/depts/obm/general/CIP/CIPDocs/CIPBooks/2021-2025CIPBookFinal.pdf.

Sewer cave-ins can take the form of collapsed manholes in the street. This photo shows a recent example of a sewer cave-in in Chicago. Source: DWM

II | Sewer Cave-in Inspection Complaints

Members of the public can report suspected cave-ins through the City's 311 system, which is administered by a division of the Office of Emergency Management and Communications (OEMC). DWM responds to reports of cave-ins and uses the 311 system to track the stages of its response.

A | 311 Service Requests and Work Orders

Chicago implemented its 311 system in 1999. The City began using its current 311 software, Salesforce, in December 2018. The software allows departments and the public to track the stages of complaints. It is meant to provide transparency for complainants who want to understand how the City is responding to a complaint and how long the response will take. A person or department can register a complaint by,

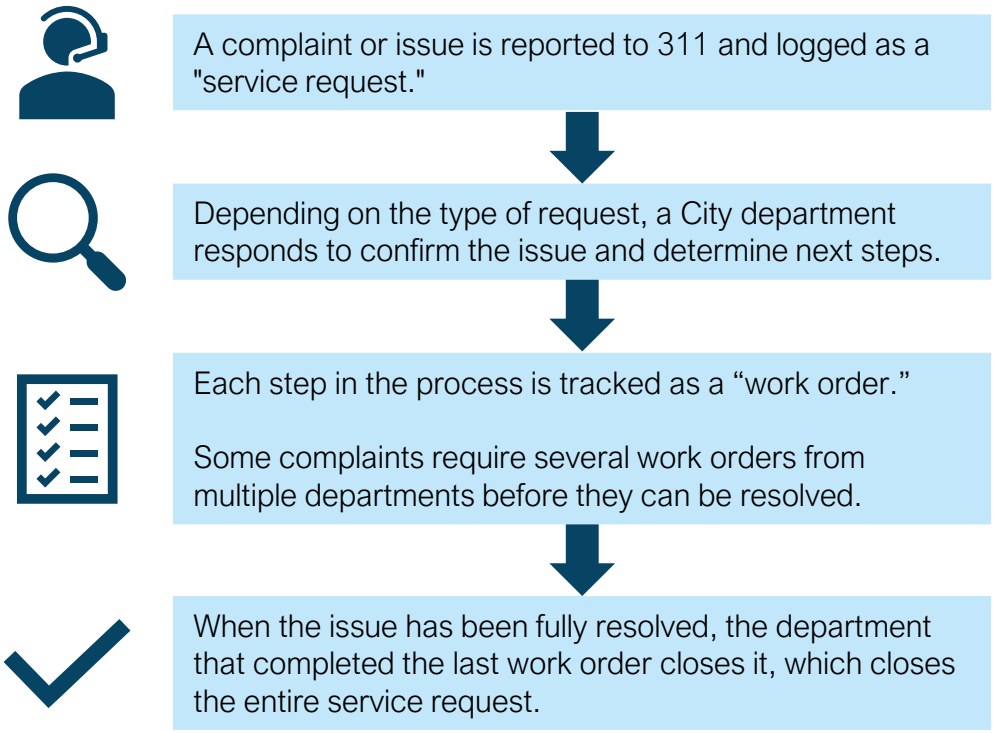
- dialing 311;
- visiting 311.chicago.gov;
- using the CHI311 mobile application; or
- contacting a local alderperson's office.[4]

Salesforce records complaints under a number of predefined categories. Complainants should report suspected sewer cave-ins using the "Sewer Cave-in Inspection Request" category. Each complaint—referred to as a "service request"—is assigned a 10-digit tracking number. The steps in the response process are tracked as "work orders." Service requests and work orders have a

[4] Suspected cave-ins can also be entered by alderpersons and other City staff.

parent-child relationship, with the service request being the "parent" and the associated work orders as derivative "child" entries. Complainants can use the tracking number associated with their complaint to view the request and the status of each related work order, much like tracking a package as it moves through the mail system. The service request remains open until the City completes all the associated work orders. Figure 1 shows an overview of the lifecycle of a 311 complaint.

Figure 1: 311 tracks the City's response to complaints using work orders.



Source: OIG visualization of 311 complaint process

For each sewer cave-in inspection service request, the first work order is an inspection by DWM. This is because, prior to an inspection, there is no way for the Department to know what the issue will be or what any necessary response will entail. Depending on the outcome of the inspection, work orders for cleanings, repairs, or transfers to other departments may follow. For example, during their initial inspection, DWM could discover that the cause of the issue identified by the complainant is not a sewer cave-in, and that the complaint needs to be addressed by a different department. The Chicago Department of Transportation is responsible for issues such as repairing potholes and other pavement surface damage, and the Department of Streets and Sanitation is responsible for removing tree stumps that hinder DWM's access to infrastructure. In these instances, DWM assigns a work order to the relevant department. This new work order can extend the overall closure time for the request as DWM waits for the proper department to respond.

B | Response Timeliness and Reporting

The City measures and reports on how quickly departments respond to 311 requests. Information about response times is publicly available online so that complainants can track the status of their

request, but also in City's internal reporting for departmental tracking purposes. The information provided to the public may not match the information used by the department, however.[5]

Complainants receive either an "estimated" or "average" completion time when they file their request electronically.

- **Estimated Completion Time:** Every type of service and work order has a static target response time in Salesforce called a "service level agreement," or SLA.[6] For most requests, the CHI311 website and phone application display these SLAs using the phrase "estimated completion time."
- **Average Completion Time:** Other types of requests show dynamic "average completion times" instead of "estimated" times.[7] The City implemented dynamic completion times in early 2023 to give the public a better estimate. Dynamic times update nightly based on the past 12 months of data for that service request type, and are currently only available for the 44 most common complaint types—including sewer cave-in inspection requests.

Neither of these publicly reported times are estimates of the time it will take to fully address the complaint. They only reflect the estimated time to complete the current work order. As the City moves step by step through the service request, the 311 system updates to include the currently active work order and its corresponding "estimated" or "average" completion time.

Between January 1, 2019, and August 10, 2023, DWM received 27,258 unique sewer cave-in inspection requests. OIG attempted to calculate the time DWM took to fully address sewer cave-ins, but was unable to because of inaccurate and inconsistent data. OIG could only determine that, for the 27,258 requests, DWM's median time to close or cancel the initial inspection work order was less than a day.

C | DWM's Sewer Cave-in Complaint Response Process

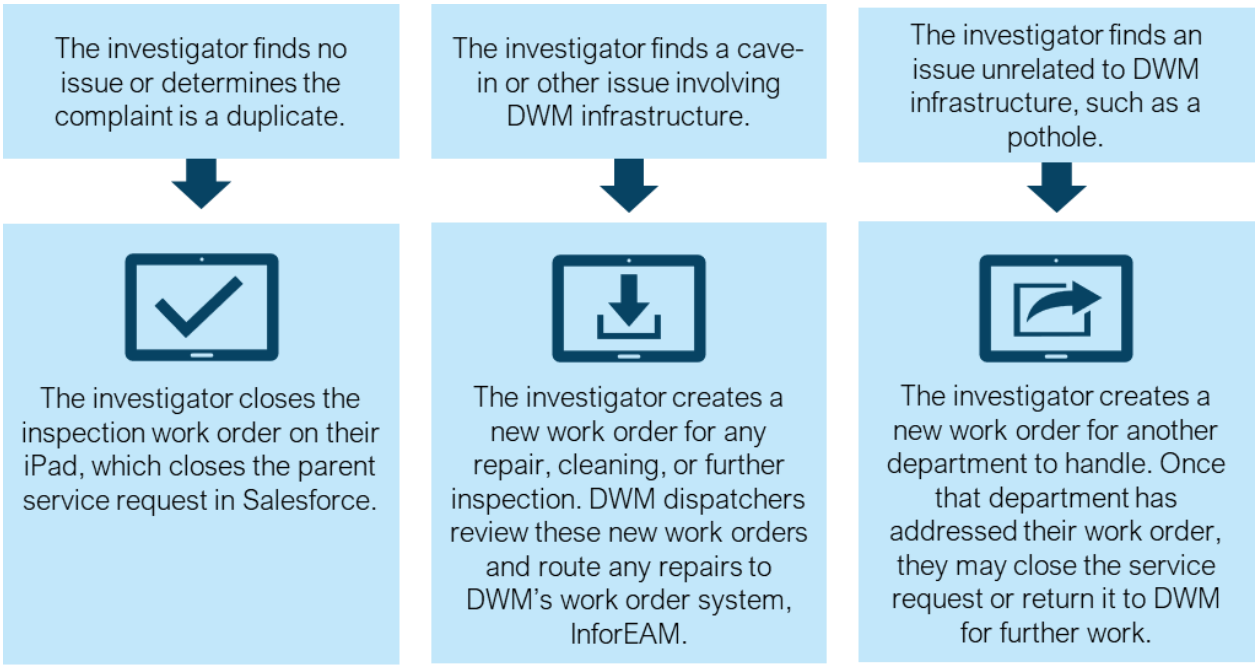
DWM's Bureau of Operations and Distribution (BOD) is responsible for responding to sewer cave-in complaints and conducting related repairs.

When DWM receives a complaint about a possible sewer cave-in via 311, dispatchers review it to determine whether it is a duplicate of a complaint already on record. Duplicate requests happen when multiple complainants report the same issue at the same address. Salesforce automatically classifies requests as duplicates based on certain parameters, such as when addresses match exactly. However, DWM dispatchers conduct a second review to identify additional duplicates not identified by Salesforce. If they determine the complaint is likely a duplicate, they cancel the request and make a note in a comment field in Salesforce.

[5] OIG will further explore the inconsistency between public and departmental information in a project on the City's 311 service request performance, as described in the Audit and Program Review 2024 Draft Annual Plan.
[6] Service departments set their own SLAs, which they can change only with OEMC approval. OEMC also monitors how quickly departments respond to complaints, both at the service request and work order levels.
[7] While the City describes these as "average" completion times, they are actually median completion times. Averages would be calculated by dividing the sum of the completion times by the number of related requests. In contrast, the median completion time is calculated by identifying the "middle" value when all values are arranged from smallest to largest. City management stated that they describe the median as the "average" because they believe it makes more sense to a lay-person.

If the complaint is not immediately identifiable as a duplicate, dispatchers make it available for a BOD crew to respond. BOD investigators view open work orders using iPads that interface live with Salesforce. BOD management and staff reported that investigators prioritize work orders by the age of the work order, the location of the issue, and the level of urgency based on their own expertise. Once on site, the investigator inspects the area to determine the basis for the complaint and confirm its level of urgency. Figure 2 shows the types of outcomes an investigator may encounter for sewer cave-in complaints.

Figure 2: BOD investigators may find one of several situations when they inspect a complaint.



Source: OIG visualization of DWM response process

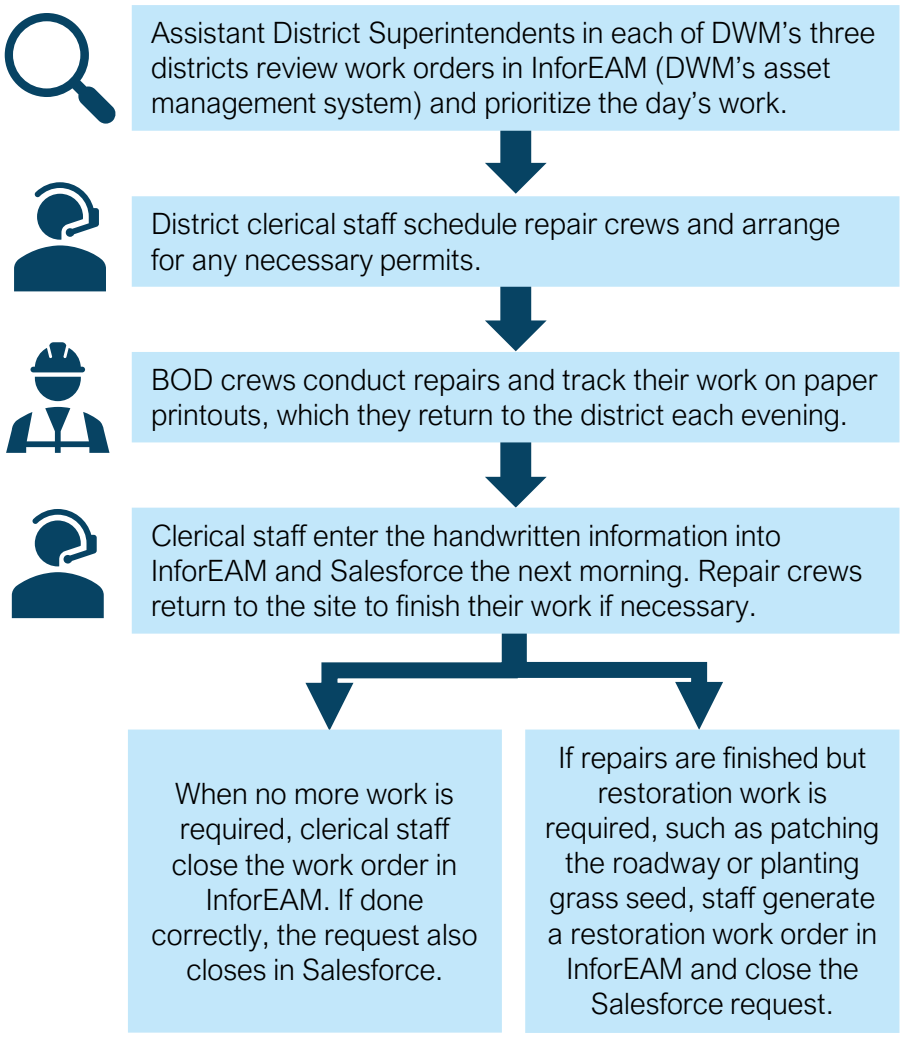
The public-facing Salesforce interface does not show any detail about why a complaint was closed. It only shows the status of a work order. Salesforce does not offer "Duplicate" as a status or outcome, therefore dispatchers mark duplicate complaints as "Canceled" and investigators choose from inaccurate options such as "No Problem Found." DWM staff use comment fields to explain that the request is a duplicate, but those fields are not visible to the public. As a result, the 311 application and website can be misleading and do not always provide enough detail for complainants to understand why their request was closed. DWM reports that it is currently pursuing a technology solution for this issue.

A DWM investigator explained that, because duplicates are not visible to the public, people resubmit tickets and include angry comments like, "STOP CLOSING THIS TICKET!"

If a BOD investigator confirms that DWM needs to conduct a repair, staff in each of DWM's three geographical districts—North, Central, and South—are responsible for scheduling repair crews, organizing permits, and documenting information about the status of each work order. Following a repair, DWM or one of its contractors may need to restore the roadway or parkway to its previous condition. Restoration work can include patching asphalt or planting grass. Restoration work orders are stored only in InforEAM, DWM's internal work order system, and do not appear in Salesforce.

As a result, complainants may see that their service request has been closed even while the street or parkway is not fully restored. Figure 3 illustrates this process.

Figure 3: When repairs are necessary, staff in each of DWM's three districts address them.



Source: OIG visualization of DWM response process

DWM does not include street restorations in Salesforce because those projects can take as long as six months based on the season, the type of restoration, and the responsible party.

D | Conclusion

With this report, OIG aims to provide Chicagoans with basic information about sewer cave-ins, the City's 311 system, and DWM's response to this type of complaint. Sewer cave-ins take many forms—from a slight depression in the pavement to a large hole in the street—and complaints to 311 involve a multi-step process that can involve multiple departments before the complaint can be closed. Community members who report sewer cave-ins can experience confusion and frustration when they see the issue still exists, yet their service request is closed. Although the public 311 system is meant to provide transparency regarding the City's response, it may not always provide

enough information for complainants to follow and understand the subsequent steps taken by DWM—for example, whether a complaint is a duplicate or why it was canceled. DWM reports that it is currently pursuing a technology solution for this issue, and OIG's DRAFT 2024 annual audit plan includes a possible future project related to the functionality of the 311 tracking system.

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