

Audit Report

City Utility Street Cut Repairs

March 2017



As of March 2016, there was a backlog of 3,864 utility cut patches awaiting a permanent utility cut repair by the Public Works Department. Some of these street cut patches are unreliable and possibly unsafe due to issues with age or height. Also, Public Works does not maintain complete and consistent data to determine the backlog's true size or whether their work is cost-effective as compared to the work of their contractor. As a result, Public Works management cannot be sure the information they report or use for planning or resource allocation is accurate.

Contents

Objective and Background	2
What We Found	3
Recommendations and Management Response	9
Scope and Methodology	15

Cover: Photo of a Public Works Department crew on 51st Street, City of Austin.

Objective

The objective of the audit was to determine whether:

- street cut repairs were completed in an effective and timely manner to minimize safety impacts to the public, and
- the current model is cost-effective.

Background

In the City of Austin, the Public Works Department completes permanent repairs on utility cuts by Austin Water. The purpose of this activity is to repair utility cut locations and pavement damaged by cuts in a timely manner. The Department's Utility Excavation Repair activity, which performs the utility cut repair work, has 53 employees and a budget of \$7.6 million. In fiscal year 2016, Austin Water paid Public Works almost \$8.5 million to complete repair activities. In June 2016, Public Works entered into a \$1 million contract with a vendor who performs some repairs on streets with an asphalt surface.

Cold mix asphalt is a material used in temporary patches and is not allowed to be in place longer than 90 days. Hot mix asphalt is a material used in permanent repairs on streets with an asphalt surface.

Many street cuts made by Austin Water are due to water leaks or breaks in infrastructure. When Austin Water needs to repair a utility component under a street, they cut into streets to make repairs and then patch the street with a temporary repair made of cold mix asphalt. Austin Water is responsible for maintaining the patch for 30 days. After 30 days have passed, Public Works is responsible for maintaining the patch.

In an average month, Austin Water makes 185 utility cuts and patches, and Public Works makes 89 repairs.

Based on data from Public Works, Austin Water makes an average of 185 utility cuts and patches per month and tracks these in its work order management system. After Austin Water patches a street cut, they send a work order to Public Works who then inspects Austin Water's temporary patch to plan the dimensions of the final repair according to the City Code Standards Manual. Public Works then completes the repair using hot mix asphalt or concrete. Public Works makes an average of 89 repairs per month. Exhibit 1 below shows a summary of the street cut repair process.

Exhibit 1: Street Cut Repair Process



Temporary Patch

The Austin Water Utility cuts into a street to repair infrastructure and then patches the street cut.



Street Cut Repair

The Public Works Department makes the street cut repair.

SOURCE: Office of the City Auditor analysis of street cut repair process, December 2016

What We Found

Summary

As of March 2016, there was a significant backlog of utility cut patches awaiting a permanent repair that could take several years for the Public Works Department to address. Some of these utility cut patches are unreliable and may pose a safety hazard due to issues with age or height. Public Works does not maintain complete and consistent data to determine the backlog's true size or whether their work is cost-effective in comparison with the work of their contractor. As a result, Public Works management cannot be sure the information they report or use for planning or resource allocation is accurate.

Finding 1

There is a large and growing backlog of temporary utility cut repairs on Austin roads that may be unreliable and possibly pose a safety hazard while awaiting a permanent resurfacing.

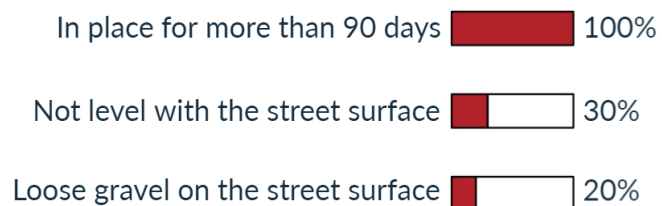
If Austin Water did not make any more cuts, it would take Public Works 3.6 years to bring the backlog of utility cut repairs to zero.

Ten randomly sampled street cut patches were all in place longer than 90 days, violating City Code.

According to data provided by the Public Works Department, there was a backlog of 3,864 patches awaiting a repair as of March 2016.¹ Patches are the temporary repairs put in place to cover a cut into a street prior to completion of the final repair. The data showed a growing backlog since the beginning of the audit scope period, October 1, 2013, and a backlog was also noted in a November 1998 audit report from the City Auditor. The average completion time for a repair was 357 days, or about a year, and completion times ranged from one month to over a year and a half. If Austin Water made no additional cuts, it would take Public Works 3.6 years to bring the backlog down to zero.

Some temporary street cut patches are unreliable and possibly unsafe. Auditors reviewed ten randomly sampled street patches from the March 2016 backlog. As seen in the exhibit below, all ten were in place longer than 90 days, which violates the City Code Standards Manual.² In addition, three patches were more than 1/4" higher than the surrounding street surface, a result of problems in the initial temporary repair by Austin Water. Two patches also had loose gravel on the street surface, which appeared to be due to the delayed repairs.

Exhibit 2: Temporary Street Cut Patches are Not in Compliance



SOURCE: Office of the City Auditor analysis of sampled temporary street cut patches, November 2016

¹ This figure includes repairs on streets as well as driveways, sidewalks, curbs, and gutters.

² Series 1100 – Trench and Street Repair, 1100-S4 Temporary Trench Repair-Asphalt Surface.

The photos below show examples of patches with loose gravel on the surface (picture on left) and a surface that is not level with the road (picture on right).

Exhibit 3: Non-Compliant Temporary Street Cut Patches



SOURCE: Office of the City Auditor photos, October 2016

Public Works staff confirmed three of the sampled patches were unreliable and possibly unsafe. The Standards Manual requires the repaired surface to be level with the normal surface of the road (within 1/4") and free of loose gravel. According to Public Works, surfaces that are not level and have loose gravel may pose safety risks. In addition, patches may deteriorate after 90 days, which is the maximum length of time the City Code allows patches to be in place before being permanently repaired.

The City relies on residents to report issues with patches, so they are not aware of which or how many patches may be unsafe.

Both Austin Water and Public Works rely on residents to report issues with patches, so the City is not aware of which or how many patches currently in place may be unsafe. Austin 311 data showed most service requests related to patches were reported as a result of a quality issue such as a failing patch or a rough or bumpy ride. Examples of service requests included reports of an exposed hole, a pipe sticking out of the road, and a patch that had fallen by 10 inches.

Public Works has fewer resources for street cut repairs than Austin Water.

Public Works has fewer crews working street cut repairs than Austin Water. Because of resource differences, Austin Water has made street cuts and patches at a faster rate than Public Works has been able to complete the final repairs, resulting in the large backlog.

Due to resource differences, Public Works is not able to make repairs at the pace Austin Water makes cuts.

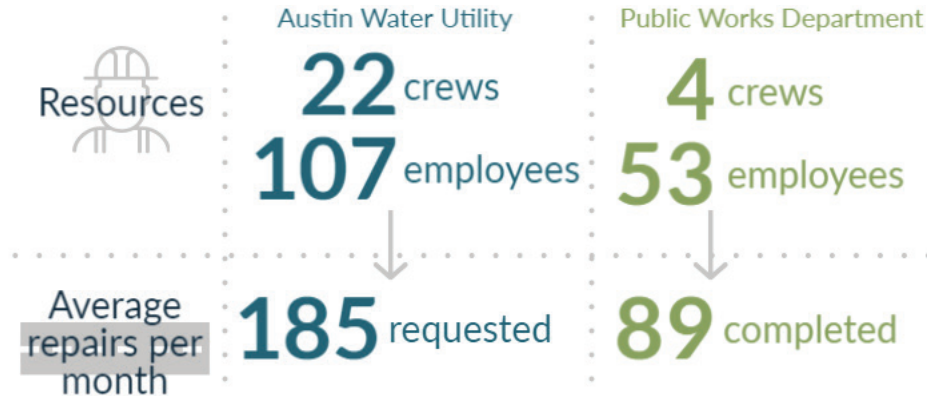
As of January 2017, Austin Water reported they had 107 available employees across 22 crews to repair utilities under streets and place temporary patches. Public Works reported they had 53 employees across 4 crews completing the permanent repairs (see Exhibit 4). As a result, Austin Water creates more cuts per month (185 on average)³ than Public Works is able to repair per month (89 on average).⁴ Public Works requested and obtained 12 new Full-time Equivalents (FTE) in fiscal year 2015 and 8 new

³ The 185 figure represents the average number of utility cuts between October 2014 and March 2016.

⁴ The 89 figure represents the average number of completed repairs between April 2015 and March 2016.

FTEs in fiscal year 2017, but the department did not request any additional FTEs in fiscal year 2016. In January 2017 Public Works reported 11 vacant positions.

Exhibit 4: Analysis of Resources and Average Monthly Repairs



SOURCE: Office of the City Auditor analysis, January 2017

Public Works’ lack of documented policies and procedures may prevent the department from performing street cut repairs efficiently and effectively.

Public Works may not be addressing the backlog in an efficient manner. The Department does not have documented policies or procedures for deciding the order in which they complete repairs. In addition, Public Works management and crew supervisors described different processes for deciding which repairs are completed first. A Public Works manager explained all repairs occur in order from oldest to newest, while crew supervisors explained that a newer repair might be completed before an older one if a customer makes a request.

Public Works also does not have documented policies or procedures for inspecting patches to determine the final repair’s dimensions or for performing quality assurance and control activities. As a result, the Department may not be able to verify that inspections are done according to standards, or that completed work orders undergo the same quality assurance process. Without documented procedures, some processes may be performed inconsistently and organizational knowledge may be limited to only a few personnel. Best practices recommend organizations create policies that establish what is expected and procedures that put policies into action.⁵

⁵ Committee of Sponsoring Organizations of the Treadway Commission, *Internal Control - Integrated Framework*.

Finding 2

Public Works does not maintain sufficient data to verify the backlog's true size or determine the cost-effectiveness of street cut repairs.

The City cannot be sure a work order marked as complete is actually complete.

The backlog derived from Public Works' data does not match the backlog reported in the Department's performance measure.

Inconsistent and incomplete data on street cut work orders prevents the City from determining the accurate size of the backlog of temporary utility cut patches and prevents Public Works from determining the cost-effectiveness of repairs.

Public Works' data is inconsistent with Austin Water's data.

Inconsistencies between Austin Water and Public Works data indicate that the City cannot determine when a work order was started or completed, or whether a work order marked as completed is actually complete. Such inconsistencies may cause management to have an inaccurate count of the backlog's size. As a result, Public Works management cannot be sure they report accurate information or effectively use this information for planning or resource allocation purposes.

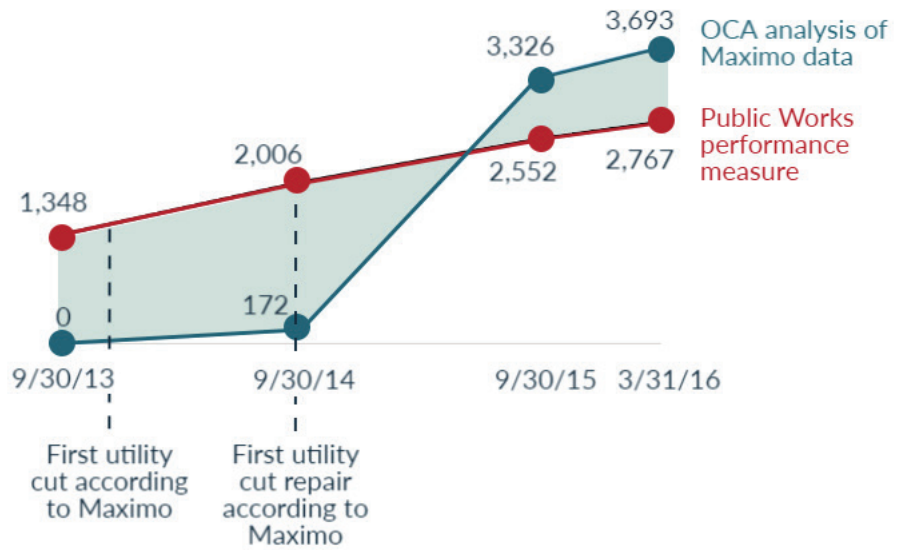
Based on a review of data provided by Public Works, 11% of repairs displayed a status (either complete or incomplete) different from Austin Water's repair status. In addition, 6 of 30 (20%) street cut repairs randomly sampled from Public Works data showed a repair start or completion date different than Austin Water data.

Public Works' data is incomplete or incorrect.

In October 2014, Public Works adopted a new work order information system called Maximo and manually entered all incomplete utility cut repair work orders at that time. However, the first utility cut location recorded in the new system was made in November 2013, and the first utility cut repair was recorded as completed in October 2014 (see Exhibit 5 below), leaving a gap during which no repairs were recorded. This gap indicates the data is either incomplete or incorrect. Public Works' data also indicates that the backlog began at zero on October 1, 2013, although performance measures show a backlog before this date. As seen in the shaded areas of the graph, the Maximo data provided indicate the backlog did not match the reported performance measure from the end of fiscal year 2013 to the middle of fiscal year 2016. On March 31, 2016, the two backlog figures differed by 926 work orders. Best practices recommend that organizations develop control activities over technology to support the achievement of its goals.⁶

⁶ Committee of Sponsoring Organizations of the Treadway Commission, *Internal Control - Integrated Framework*.

Exhibit 5: Discrepancies in the Backlog Size for Repair Locations Older than 4 Weeks As Documented in Maximo and Reported by Public Works



SOURCE: Office of the City Auditor analysis of Public Works data and performance measures, January 2017

Due to issues with cost data, Public Works cannot determine if it makes sense to contract with a vendor for asphalt repairs.

Cost-effectiveness of asphalt repairs cannot be determined.

In June 2016, Public Works contracted a vendor to perform repairs on roads with an asphalt surface. This is Public Works' first contract for utility cut repair work and the department entered into the contract to reduce the backlog. The contract is for \$1 million and has a three-year term, renewable every year. Public Works obtained this contract at the lowest possible bid price.

However, Public Works cannot determine if the contract is cost-effective as compared to their repair costs. Data that Public Works collects on the costs of its in-house repairs is incomplete and may not reflect actual labor and equipment expenses. For instance, Public Works' staff stated that repair crews have not been consistent about recording information about repair sizes. Knowing the size of the repair is key in determining whether repairs were cost-effective. Another issue with the data noted by Public Works' staff includes potentially inaccurate hourly rates for repair crew members due to Public Works recording the average labor rate for a job classification, rather than the rate for a specific employee. Also, Public Works records the rental rate for tools the City already owns, which may overstate costs.

Additional Observation

The City may not have the information it needs from Public Works to coordinate work performed on Austin streets.

Public Works may be making it more difficult for the Austin Transportation Department to coordinate street repair work. Per Administrative Bulletin 99-01, when a City department makes a street cut it is required to get an excavation permit from Austin Transportation. Austin Transportation uses the excavation permit information to coordinate planned work on streets. For example, if a street cut is located on a road scheduled to be repaved in the near future, Austin Transportation may recommend that Public Works forego repairing the street cut.

However, while Public Works performs work under the required permit, it does not notify Austin Transportation when street cut repairs are completed. As a result, Austin Transportation may not be able to effectively coordinate street repair work between departments.

Recommendations and Management Response

To address Finding 1, which noted that the large and growing backlog of temporary utility cut repairs on Austin roads may pose a safety hazard while awaiting a permanent resurfacing, we make the following recommendations.

1 | The Public Works Department Director should evaluate options for eliminating the backlog of utility cut repairs, such as expanding the use of contracted services and reallocating resources internally.

Management Response: Agree

Proposed Implementation Plan: Staff from Street & Bridge Operations (SBO) will:

- a) Ensure the current indefinite delivery/indefinite quantity contract for Asphalt Repairs is renewed and evaluated for potentially increasing it to help eliminate the backlog of utility cut repairs.
- b) Work with staff from Austin Water to brainstorm and implement ideas that help eliminate the backlog, including Developing an IDIQ Contract for Rehabilitation projects which will allow SBO staff to dedicate 4 to 8 additional weeks to backlog repairs. SBO staff will work with Project Management to establish 2 IDIQ contracts. An IDIQ contract to handle concrete repairs and another IDIQ contract to handle asphalt repairs will be prepared to help eliminate the backlog within 18 months after contracts are established.
- c) Document Street & Bridge's Service Plan to reflect the reallocating of internal resources from other SBO for utility cut repairs.
- d) Eliminate the current 3,864 backlog of utility cut repairs in 18 months from the date new IDIQ contracts are in place, including requesting for additional funds to make this happen. Please note, as of March 17, 2017, data analysis and cleanup of the work order system has resulted in a more accurate backlog number of 2,204. This includes all locations (excluding the 2017 Contract) that have not been field completed both pre and post interface.

Proposed Implementation Date: April 2019

2 | The Austin Water Director should ensure temporary patches meet the requirements of the City Code Standards Manual.

Management Response: Agree

Proposed Implementation Plan:

1. Training (Initiate in 30-90 days) - Provide new and refresher training to field and supervisor water and wastewater maintenance staff on City Code Standard and Installation Practices by Quarter 4 of FY2017.
2. Re-inspection at 30 days - Re-inspect patches at 30 days from installation against standard by end of FY2017.
3. Develop a Service Level Agreement with Public Works to outline roles and responsibilities for temporary patch work and other administrative requirements.
4. Dedicated resources to QA/QC work performed - monitor temporary repair standard, training, 30-day condition, and records management by FY2018.

Proposed Implementation Date:

1. Quarter 4 of FY2017
2. End of FY 2017
3. End of FY 2017
4. FY 2018

3

The Public Works Director should develop, implement, and monitor written policies and procedures to ensure:

- a) utility cut repair work order data is complete and accurate;
- b) repairs are prioritized efficiently;
- c) inspections are performed in compliance with the City Code Standards Manual;
- d) temporary patches are not in place longer than 90 days; and
- e) quality control and assurance steps are completed consistently.

Management Response: Agree

Proposed Implementation Plan: Staff from Street & Bridge Operations (SBO) will:

- Update existing procedures and work flows for performing utility cut repairs and formalize and train staff to ensure work orders are complete, accurate and consistent. Please note, PWD and A WU found errors in data related to the interface. The errors resulted in inaccurate reporting of performance measures particularly Locations Completed and Square Yards of repairs completed. Data cleanup has begun to correct the existing errors. Additional protections are being put into place within the MAXIMO and HANSEN systems to not allow the current issues to continue.
- Develop a documented process to plan work more efficiently using the MAPSCO page and grid numbers through MAXIMO and PWD GIS, allowing for more coordination, and utilization of other workgroups efficiently.
- Develop procedure for inspections of utility cut repairs to ensure they are compliant to city code, including uploading photos into the Work Order System.
- Work with Austin Water to develop new processes for temporary repairs that meet the current city standards.
- Evaluate existing processes to ensure steps associated with quality control are adhered to, including input from Superintendents, Supervisors, inspectors and crew members to ensure an understanding of expectations and employee involvement.

Proposed Implementation Date: September 2017

To address Finding 2, which noted that Public Works does not maintain sufficient data to determine the cost-effectiveness of street cut repairs or verify the backlog's true size, we make the following recommendation.

4

The Public Works Director should assess the cost-effectiveness of the Utility Excavation Repair activity using the complete data obtained through implementation of Recommendation #3.

Management Response: Agree

Proposed Implementation Plan: Staff from Street & Bridge Operations will work with Public Works Financial staff to calculate and demonstrate how in house repairs are more cost effective, as well as defining the current business process and billing procedure for Utility Cut Repairs through an inter department agreement, and SBO procedure.

Procedures will outline how cost effectiveness will be measured and calculated and will help reach consistency when reporting cost effectiveness.

Proposed Implementation Date: September 2017

Management Response - Public Works Department



MEMORANDUM

TO: Corrie Stokes, City Auditor, Office of the City Auditor
FROM: Richard Mendoza, P.E., Director, Public Works Department
DATE: March 24, 2017
SUBJECT: Action Plan – City Street Cut Utility Repairs Audit

A handwritten signature in blue ink, appearing to be "RM", located to the right of the "FROM:" line.

In accordance with the City Utility Street Cut Repairs Audit, attached is the action plan with three recommendations. The following two pages outline management's response to recommendations, proposed strategy for implementation, the status of strategies and proposed implementation dates.

Should you have additional questions, please feel free to contact Molly Ritter, Street & Bridge Operations Division Manager, at (512) 974-8771.

Thank you.

cc: Robert Hinojosa, P.E., Assistant Director, Public Works Department
James Snow, PMP, CCC, Assistant Director, Public Works Department
David V. Magaña, P.E., City Engineer, Public Works Department
Molly Ritter, Division Manager, Public Works Department
Karen Maggio, Division Manager, Public Works Department

Action Plan

1. The Public Works Department Director should evaluate options for eliminating the backlog of utility cut repairs, such as expanding the use of contracted services and reallocating resources internally.

Management Response: Agree.

Proposed Implementation Plan: Staff from Street & Bridge Operations (SBO) will:

- a) Ensure the current indefinite delivery/indefinite quantity contract for Asphalt Repairs is renewed and evaluated for potentially increasing it to help eliminate the backlog of utility cut repairs.
- b) Work with staff from Austin Water to brainstorm and implement ideas that help eliminate the backlog, including Developing an IDIQ Contract for Rehabilitation projects which will allow SBO staff to dedicate 4 to 8 additional weeks to backlog repairs. SBO staff will work with Project Management to establish 2 IDIQ contracts. An IDIQ contract to handle concrete repairs and another IDIQ contract to handle asphalt repairs will be prepared to help eliminate the backlog within 18 months after contracts are established.
- c) Document Street & Bridge's Service Plan to reflect the reallocating of internal resources from other SBO for utility cut repairs.
- d) Eliminate the current 3,864 backlog of utility cut repairs in 18 months from the date new IDIQ contracts are in place, including requesting for additional funds to make this happen. Please note, as of March 17, 2017, data analysis and cleanup of the work order system has resulted in a more accurate backlog number of 2,204. This includes all locations (*excluding the 2017 Contract*) that have not been field completed both pre and post interface.

Proposed Implementation Date: April 2019.

3. The Public Works Director should develop, implement, and monitor written policies and procedures to ensure:
 - a) utility cut repair work order data is complete and accurate;
 - b) repairs are prioritized efficiently;
 - c) inspections are performed in compliance with the City Code Standards Manual;
 - d) temporary patches are not in place longer than 90 days; and
 - e) quality control and assurance steps are completed consistently.

Management Response: Agree.

Proposed Implementation Plan: Staff from Street & Bridge Operations (SBO) will:

- Update existing procedures and work flows for performing utility cut repairs and formalize and train staff to ensure work orders are complete, accurate and consistent. Please note, PWD and AWU found errors in data related to the interface. The errors resulted in inaccurate reporting of performance measures particularly Locations Completed and Square Yards of repairs completed. Data cleanup has begun to correct the existing errors. Additional protections are being put into place within the MAXIMO and HANSEN systems to not allow the current issues to continue.

- Develop a documented process to plan work more efficiently using the MAPSCO page and grid numbers through MAXIMO and PWD GIS, allowing for more coordination, and utilization of other workgroups efficiently.
- Develop procedure for inspections of utility cut repairs to ensure they are compliant to city code, including uploading photos into the Work Order System.
- Work with Austin Water to develop new processes for temporary repairs that meet the current city standards.
- Evaluate existing processes to ensure steps associated with quality control are adhered to, including input from Superintendents, Supervisors, inspectors and crew members to ensure an understanding of expectations and employee involvement.

Proposed Implementation Date: September 2017.

4. The Public Works Director should assess the cost-effectiveness of the Utility Excavation Repair activity using the complete data obtained through implementation of Recommendation #3.

Management Response: Agree.

Proposed Implementation Plan: Staff from Street & Bridge Operations will work with Public Works Financial staff to calculate and demonstrate how in house repairs are more cost effective, as well as defining the current business process and billing procedure for Utility Cut Repairs through an inter department agreement, and SBO procedure.


Procedures will outline how cost effectiveness will be measured and calculated and will help reach consistency when reporting cost effectiveness.

Proposed Implementation Date: September 2017.

Management Response - Austin Water



MEMORANDUM

To: Corrie Stokes, City Auditor
From: Greg Meszaros, Director, Austin Water 
Date: March 2, 2017
Subject: Response to Audit Findings – Austin Water Recommendations and Management Response to Item 2, City Utility Street Cut Repairs

Recommendations and Management Response to Item 2.

The Austin Water Utility Director should ensure temporary patches meet the requirements of the City Code Standards Manual.

Management Response: Concur

Proposed Implementation Plan:

1. Training (Initiate in 30-90 days) – Provide new and refresher training to field and supervisor water and wastewater maintenance staff on City Code Standard and Installation Practices by Quarter 4 of FY2017.
2. Re-inspection at 30 days – Re-inspect patches at 30 days from installation against standard by end of FY2017.
3. Develop a Service Level Agreement with Public Works to outline roles and responsibilities for temporary patch work and other administrative requirements.
4. Dedicated resources to QA/QC work performed – monitor temporary repair standard, training, 30-day condition, and records management by FY2018.

Proposed Implementation Date:

1. Quarter 4 of FY2017
2. End of FY 2017
3. End of FY 2017
4. FY 2018

cc: Robert Goode P.E., Assistant City Manager

Scope

The audit scope included street cut repair activities from October 1, 2013 through March 31, 2016. The scope also included costs related to the contract the Public Works Department executed with a private company on June 23, 2016 for street cut repairs. Some information in this report relates to utility cuts on streets, driveways, sidewalks, curbs, and gutters; the audit focused on repairs made in streets

Methodology

To accomplish our audit objectives, we performed the following steps:

- interviewed Austin Water and Public Works Department employees;
- reviewed repair standards used by Austin Water and Public Works;
- analyzed Public Works' information system data to assess the backlog of repairs;
- reviewed Public Works' information system user access controls;
- analyzed Austin Water's information system data to compare with Public Works' data;
- visited a random sample of temporary repair locations and assessed their safety with the help of Public Works staff;
- reviewed right-of-way permits for a random sample of completed permanent repairs;
- evaluated the cost-effectiveness of the City of Austin's utility cut repair process;
- reviewed service request data related to street cut repairs provided by Austin 311; and
- evaluated internal controls related to street cut repairs.

Audit Standards

We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards. 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.

The Office of the City Auditor was created by the Austin City Charter as an independent office reporting to City Council to help establish accountability and improve City services. We conduct performance audits to review aspects of a City service or program and provide recommendations for improvement.

Audit Team

Walton Persons, Audit Manager
Caroline Kirschner, Auditor-in-Charge
Henry Katumwa
Andrew Keegan
Sam Naik
Kimberly Bernsen

City Auditor

Corrie Stokes

Deputy City Auditor

Jason Hadavi

Office of the City Auditor

phone: (512) 974-2805

email: oca_auditor@austintexas.gov

website: <http://www.austintexas.gov/auditor>



AustinAuditor



@AustinAuditor

Copies of our audit reports are available at
<http://www.austintexas.gov/page/audit-reports>

Alternate formats available upon request