



Date: March 27, 2023

To: Sheryl M.M. Long, City Manager

From: Lauren Sundararajan, CFE, Internal Audit Manager *LS*

Copies to: Internal Audit Committee
William Weber, Assistant City Manager
John S. Brazina, P.E., Director of Transportation and Engineering

Subject: **Street Rehabilitation Program Audit**

Attached is the Street Rehabilitation Program audit report. The primary objective of this performance audit was to assess program performance and operations, the adherence to contractual provisions, and compliance with laws, regulations, or other requirements. This audit was conducted in accordance with the current audit agenda.

We would like to thank the management and staff of the Department of Transportation and Engineering (DOTE) for their assistance and cooperation during this audit.

If you need any further information, please contact me.

Attachment

Street Rehabilitation Program Audit

March 2023



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Executive Summary

Internal Audit (IA) conducted a performance audit of the Department of Transportation and Engineering's (DOT) Street Rehabilitation Program. The primary objective of this audit was to assess program performance and operations, the adherence to contractual provisions, and compliance with laws, regulations, or other requirements.

The audit revealed several opportunities for improvement in the management of program operations. For example, IA found a long-term strategic plan has not been established to secure funding. The Approved Biennial Budget for the program reflects a shortfall of approximately \$10 million dollars each Fiscal Year (FY) over the next five years. This shortfall could impact the number of streets selected for resurfacing. Maintaining proper funding levels is necessary to ensure roadways are safe and in adequate condition.

IA also found the program's 100 lane-mile goal needs to be re-evaluated. The goal was established by City Council in 2000 and directed the department to repave 100 lane miles per year. However, the goal has not been met since 2018. Additionally, IA found preventative maintenance was not performed in calendar year (CY) 2021 due to the pandemic and rising costs. Preventative maintenance is the process of extending the street life for an additional 10 - 15 years by providing the surface treatment needed. Ensuring a contingency plan is established for preventative maintenance prior to unforeseen circumstances is necessary for efficient operations.

Policies and procedures are key components of an internal control structure. Policies are designed to provide direction to staff on how to properly manage a particular function. Procedures provide employees with instructions on how to carry out the day-to-day activities. IA found that standard operating procedures (SOP) do not exist for the program. The failure to create a program SOP makes it difficult to hold staff accountable and ensure program objectives are met. Also, interdepartmental communication efforts need improvement. The breakdown in communication among departments creates additional work and can lead to an inefficient process.

To strengthen the internal controls over program operations, IA recommends creating a long-term strategic plan, re-evaluating the 100 lane-mile goal, drafting a SOP, establishing a contingency plan for preventative maintenance, and streamlining communication between DOT and City departments.

I. Introduction

Background

The Street Rehabilitation Program provides resources for the systematic repair and resurfacing of streets throughout the City. These improvements improve safety for motorists and quality of life for residents by preserving and upgrading street pavements and curbs.¹ Currently, the program manages over 2,900 lane miles that encompasses all 52 neighborhoods.² A lane mile is defined as an area of measurement used in street rehabilitation projects that factors in the total amount of pavement and aggregate base needed to cover an area 10-feet wide by 1 mile long.³

Street rehabilitation projects are performed by outside contractors. The program is managed by a Principal Engineer, who oversees one Supervising Engineer, one Senior Engineer and one administrative support position. However, the work performed by the program's staff is not limited to these four positions. The work expands among multiple divisions within the department that requires staff with specialized expertise to assist with street rehabilitation projects.

Additionally, the program routinely consolidates activities of other DOTE initiatives into Street Rehabilitation contracts. These programs may include pedestrian safety, street calming, retaining walls, and bicycle lanes, all of which allow the department to benefit from an "economy of scale" when constructing infrastructure projects. Further, the program may coordinate with other City departments, utility companies and/or development entities when planning and scheduling street rehabilitation projects in an effort to avoid placing new pavement on the ground, only to have it later cut.⁴

When selecting streets for resurfacing, several factors are considered including: funding, rehabilitation cycle year, anticipated utilities/development, and current pavement conditions. Program funding is provided by capital resources and can be matched with federal, state, and/or local grants. The three-year rehabilitation cycle consists of assigning every neighborhood a specific year (year 1, year 2, or year 3) and performing street rehab work in that community during that particular year. Anticipated utilities/development are considered to avoid conflict of work previously scheduled. Current pavement conditions of the roadways that are rated in worse or poor condition are also considered when selecting streets.⁵

The program is also responsible for overseeing preventative maintenance. Preventative maintenance is the process of extending street life for an additional 10 – 15 years by providing the surface treatment needed.

¹ City of Cincinnati All Funds Biennial Budget Volume II: Approved Capital Budget, p. 249.

² <https://www.cincinnati-oh.gov/dote/street-sidewalk-rehab/street-rehabilitation-program/>

³ Ibid.

⁴ FYI Memo 2012 St. Rehab Program Report, dated 2/23/2012, p. 2.

⁵ Ibid. p. 6 – 7.

Audit Selection

IA conducted this audit in accordance with the Audit Work Plan.

Audit Objective

The primary objective of this performance audit was to assess program performance and operations, the adherence to contractual provisions, and compliance with laws, regulations, or other requirements.

Audit Scope and Methodology

In order to achieve the audit objective, IA interviewed appropriate staff, reviewed contracts, supporting files, and obtained access to multiple databases for street rehabilitation records. The data collected was from 2015 through 2022.

Statement of Auditing Standards

As required by the Cincinnati Administrative Code Article II §15, this audit was conducted in accordance with the Generally Accepted Government Auditing Standards (GAGAS), except for standard 5.60 pertaining to external peer review requirements. This exception did not have a material effect on the audit.

IA continues to conduct internal quality reviews to assure conformance with applicable GAGAS. IA performed the fieldwork between August of 2022 and January of 2023.

Commendations

IA commends the staff of the Department of Transportation and Engineering for their cooperation throughout the audit.

II. Audit Findings and Recommendations

A long-term strategic plan has not been established to secure funding.

City Council allocates capital resources to the Street Rehabilitation Program each year. These resources directly relate to the number of streets selected for rehabilitation. DOTE pursues outside funding through federal, state, and local grants and uses its capital resources to provide the required match, leveraging City funds to enlarge program operations.⁶

IA reviewed the FY 2022 – 2023 Approved Biennial Budget for the program. The budget projection for the next five years reflects a shortfall of approximately \$10 million each FY. The table below captures this information along with the program's needs and planned capital resources.⁷

	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
STREET REHAB NEED	\$26,780,000	\$27,583,000	\$28,410,000	\$29,262,000	\$30,140,000
PLANNED CAPITAL RESOURCES	\$17,137,000	\$18,490,000	\$18,542,000	\$19,082,000	\$19,173,000
FUNDING GAP	\$(9,643,000)	\$(9,093,000)	\$(9,868,000)	\$(10,180,000)	\$(10,967,000)

Table 1: Street Rehabilitation Infrastructure Assessment

Although the program relies upon leveraging City funds with outside funding resources, IA found the program does not have a long-term strategic plan documented. According to the Government Finance Officers Association (GFOA), a strategic plan is “a comprehensive and systematic management tool designed to help organizations assess the current environment, anticipate, and respond appropriately to changes in the environment, envision the future, increase effectiveness, develop commitment to the organization's mission and achieve consensus on strategies and objectives for achieving that mission. Strategic planning is about influencing the future rather than simply preparing or adapting to it.”⁸

IA was informed that program staff discuss funding restrictions when making decisions about which streets to repave. However, a written strategic plan that lays the groundwork for the organization to follow while balancing the resources available for long-term growth and maximizing program operations has not been established.

Recommendation 1: Create a long-term strategic plan to ensure proper funding is secured to meet the program needs.

Department Response: Agree. A comprehensive plan including alternative funding has been established. The department will look for outside funding sources to meet the funding gap as stated in the budget document and will be re-evaluated every 6 months. The department

⁶ FYI Memo, 2/23/2012, p. 6.

⁷ City of Cincinnati – FY 2022 – 2023 Approved Biennial Budget, p. 18.

⁸ <https://www.gfoa.org/materials/establishment-of-strategic-plans>

recommends a complete city-wide infrastructure review should be conducted, similar to the Smale Commission from 1987, to help determine appropriate funding levels.

The 100 lane-mile goal needs to be re-evaluated.

One of the program's goals is to rehabilitate 100 lane-miles per year. This goal was established by City Council in 2000.⁹ In order to achieve the goal, the department calculates the estimated cost to repave one lane mile because it serves as a unit of measurement to benchmark tangible outcomes with capital resources allocated to the program each FY. The total number of miles rehabilitated are reported to City Council.

In 2016 the Capital Acceleration Plan (CAP) was introduced by the Mayor and City Council to earmark additional funding for preventative maintenance.¹⁰ That meant 10% of the Street Rehabilitation budget would be earmarked for preventative maintenance projects over the next six years.¹¹ After CAP was implemented, DOTE began reporting preventative lane miles resurfaced and calculating the preventative maintenance construction cost per lane mile. These lane miles were added to the number of streets repaved each year to achieve the program's 100 lane-mile goal.

IA found the 100 lane-mile goal was last met in 2020. The table below reflects the program's seven-year history with reporting the total number of lane miles rehabilitated.

YEAR	REPAVED LANE MILES	PREVENTIVE LANE MILES RESURFACED	TOTAL MILES REHABILITATED
2016	127.3	52.7	180
2017	114.5	246	360.5
2018	105	98.5	203.5
2019	64	44	108
2020	67	50	117
2021	42	0	42
2022	50	40 ¹²	90

Table 2: Rehabilitated Lane Miles Completed Since 2016.

Recommendation 2: DOTE should work with the City Administration to re-evaluate the 100 lane-mile goal based upon the current resources available.

Department Response: Agree. The department proposed a new budget statement for FY23. The current budget statement states how many lane miles can be performed: The City Council previously directed the Administration to develop a Capital Budget with sufficient resources,

⁹ Council Memo 200001076: It is important to note that Council Memo 200001076 was a continuation of the Smale Infrastructure Commission Report from 1987. In that report, recommendation #3 stated the City should fund a minimum of 115 lane-miles of street rehabilitation projects per year to maintain the streets in "good" condition.

¹⁰ FYI Memo July 19, 2017.

¹¹ CAP was implemented from FY2016 – FY2021. Although CAP has ended, the department continues to plan, budget and oversee preventative maintenance projects.

¹² Preventative maintenance miles reported as an estimate on February 9, 2023 by the department.

when combined with grant resources, to complete an average of 100 lane miles of street rehabilitation each year. The Recommended FY 2023 Capital Budget Update includes \$17.1 million for the Street Rehabilitation project. DOTE also anticipates receiving outside grants of up to \$9.2 million for Street Rehabilitation projects in FY 2023. The rehabilitation cost per lane mile has increased by 51.5% over the FY 2021 actual per lane mile cost to \$500,000 in FY 2023. The department anticipates completing at least 49 lane miles of street rehabilitation using the FY 2023 recommended allocations. Additionally, 10.0% (same) of recommended resources will be used for preventative maintenance. The department intends to perform preventative maintenance on an estimated 24 lane miles in FY 2023. The Street Rehabilitation project account will not provide resources for Stormwater Management Utility appurtenances on rehabilitated streets in FY 2023. Exclusion of the stormwater infrastructure from the Street Rehabilitation scope of work will be reevaluated for inclusion in FY 2024.

Preventative maintenance was not performed in CY 2021.

Preventative maintenance is the process of extending the street life for an additional 10 - 15 years by providing the surface treatment needed. IA was informed by program staff that no preventative maintenance was performed in CY 2021 due to the pandemic and rising costs. Although this setback was disclosed in the 2021 Infrastructure Conditions Report to Council, it is imperative that the department have a contingency plan established prior to unforeseen circumstances.

Recommendation 3: Establish a contingency plan for preventative maintenance.

Department Response: Agree. The contingency plan is the Department will double the amount of preventive maintenance work for the next year.

Standard operating procedures (SOP) do not exist for the Street Rehabilitation Program.

Policies and procedures are key components of an internal control structure. Policies are designed to provide direction to staff on how to properly manage a particular function. Procedures provide employees with instructions on how to carry out the day-to-day activities.

Although a variety of resources are utilized by staff to assist with project management, IA found there is not a specific SOP for the Street Rehabilitation Program. The failure to create a program SOP makes it difficult to hold staff accountable and ensure program objectives are met.

Recommendation 4: Create a SOP for the Street Rehabilitation Program.

Department Response: Agree. The department will create an SOP for the Street Rehabilitation Program by January 1, 2024.

The contractor is not required to sample the data collected.

DOTE contracts with Data Transfer Solutions (DTS) to conduct the Pavement Condition Index (PCI) rating of the City streets. The PCI rating is "a numerical indicator that rates the surface

condition of the pavement.”¹³ IA was informed that DTS is required to sample 10% of the data to ensure accuracy. However, IA found that although it is verbally agreed upon, the contract terms between the City and DTS does not stipulate this condition.

Recommendation 5: Ensure the contract terms include the contractor is required to sample 10% of the data collected to ensure data accuracy.

Department Response: Agree. The department will add a clause in all future pavement management contracts that states the contractor shall sample 10% of the PCI collected data for a quality assurance check by January 1, 2024 or execution of next contract date whichever is sooner.

Data ownership over the Countywide Construction Coordination database has not been designated.

The Countywide Construction Coordination database was established by the Cincinnati Area Geographic Information System (CAGIS) approximately ten years ago to serve as a coordination tool among municipalities planning large scale construction projects. An interactive map was created to provide engineers with an overlapping analysis of work taking place in the right of way (ROW) throughout Hamilton County. As such, each street on the map was created as a polygon to where the rest of the street was separated from the intersections to assist with proper planning.

The first step to utilizing the database is to register the construction project. This step is important because it alerts other users who have access to the system that a department (or municipality) is thinking of performing work in the ROW. City departments that have access to the database include: Greater Cincinnati Water Works (GCWW), Metropolitan Sewer District (MSD) and DOTE. Outside entities that have access to the database include Duke Energy, Cincinnati Bell, Springdale, and Sharonville, just to name a few.

The database system has multiple users across the City and the county. IA found there is no data stewardship over the information entered into the database. For example, IA was informed that once data is entered into the system, no one is taking responsibility to update the information or check for accuracy. As a result, incorrect names are listed for projects due to staffing changes and details are missing from construction projects. These incomplete entries make it difficult for engineers to obtain the most current and accurate information available when planning construction projects.

Recommendation 6: DOTE should work with the City Administration and OPDA to designate the data owners of the Countywide Construction Coordination database to ensure accountability.

Department Response: Agree. The department will work with other departments to update the data in the Countywide Construction Coordination (CWCC) Database. The department will also work with OPDA and CAGIS to advance the timetable for CWCC to be migrated to Accela by January 1, 2025. This database must be web based to ensure data can be updated and maintained accurately.

¹³ <https://www.astm.org/d6433-03.html>

Interdepartmental communication efforts need improvement.

Maintaining open lines of communication among City departments is critical to ensuring construction projects are properly scheduled and managed by key personnel. IA found that communication between DOTE and other City departments needs strengthening.

For example, when the Street Rehabilitation Program releases the preliminary list of streets to be repaved, the list is sent electronically to multiple departments for feedback. Departments are responsible for making comments about the streets selected, and then submitting their feedback back to program staff. However, due to the fluid nature of this process, streets initially selected may be removed while new streets are added in an effort to coordinate projects with other department initiatives. Although DOTE has held bi-monthly meetings with other departments and outside entities in the past to improve communication, as rapid as these street changes occur, the breakdown in communication among departments creates additional work and leads to an inefficient process.

Recommendation 7: Streamline communication between DOTE and City departments to ensure efficiency.

Department Response: Agree. The department has added an additional work type in the Countywide Construction Coordination database for new Pedestrian Safety projects. Beginning in FY 2024 the Pedestrian Safety program can add projects into CWCC that will send ezTrak coordination emails to the Street Rehabilitation staff to coordinate work.

The construction database files are incomplete.

Maintenance of well-organized contract files is fundamental to contract monitoring. Contract files should be organized so that a third party can reconstruct and understand the history of the contract in the absence of the project manager. The administrative files should provide clear evidence that the contract was performed in accordance with the contract documents.

DOTE uses a comprehensive database to plan, record, document, monitor and report financial information for construction contracts managed by the department. IA reviewed three Street Rehabilitation projects that were completed between 2017 – 2019 and found the construction database files are incomplete. This includes missing forms, signatures missing from documents, and paperwork not uploaded into the system. Although some of the forms may be maintained in another section or outside of the department, it is vital that the database serves as a gatekeeper for all contract files to ensure transparency and compliance.

Recommendation 8: Ensure all contract files in the construction database are properly completed and maintained for accuracy.

Department Response: Agree. The department will review the current Project Management Manual to determine if roles and responsibilities need to change by January 1, 2024. Afterward, additional training and reminders will be sent to staff to keep construction records up to date. It should be noted that all final financial documents (with signatures) are kept in the Cincinnati Financial System (CFS). The construction database is not meant to be a duplicate file storage system.

Management review and oversight needs improvement.

Management oversight is necessary to ensure processes are functioning as intended and errors are detected. As identified in the above findings, IA found management review and oversight needs improvement.

For example, in the Construction Management Manual, it states "the Project Manager (PM) is the person who is responsible for the oversight and control of the entire project. The PM is responsible for securing funding, budgeting, planning, scheduling, preparing bid documents, approving changes, and general oversight of the project from inception to completion."¹⁴ The DOTE Project Management Manual further states "[the PM] gathers all project files for storage (all final documents - maintenance manuals, accounting files, etc.)" and is "ultimately responsible for the success of the project."¹⁵

The Construction Engineer also works on construction projects and maintains regular contact with the PM. Although the PM may not be the Construction Engineer's immediate supervisor, the Construction Engineer plays a vital role in the completion of these construction projects. According to the Construction Management Manual, the Construction Engineer is responsible for a variety of tasks including "set up and maintain[ing] project files."¹⁶ As such, sufficient management review and oversight of files is critical to maintaining transparency and compliance with program operations.

Recommendation 9: Management should provide additional review and oversight of the electronic files.

Department Response: Agree. The department will review the current Project Management Manual to determine if roles and responsibilities need to change by January 1, 2024. Afterward, additional training and reminders will be sent to staff to keep construction records up to date.

The Official Thoroughfare System pamphlet has not been updated since 2013.

The Development and Street Permit Section within DOTE is responsible for creating an official thoroughfare pamphlet every three years. The pamphlet provides a snapshot of the lane miles throughout the City along with street classifications, street lighting information and other resources used by department staff. New program staff would use this pamphlet as a guide for street classifications and funding applicability. Although the current staff has retained the majority of this knowledge, IA found the Official Thoroughfare pamphlet has not been updated since 2013.

Recommendation 10: Update the Official Thoroughfare System pamphlet.

Department Response: Agree. The department will publish an updated Official Thoroughfare System by January 1, 2024.

¹⁴ Construction Management Manual, September 2006, 2nd version, p. i: the 2006 Construction Management Manual was used by IA because it was applicable at the time of the completion of the street rehabilitation projects. The department updated the Construction Management Manual in January 2021.

¹⁵ City of Cincinnati DOTE Project Management Manual, 1. Project Manager, 1.22 & 1.23, 3/2008: the 2008 Project Management Manual was used by IA because it was applicable at the time of the completion of the street rehabilitation projects. The department updated the Project Management Manual in August 2019.

¹⁶ Construction Management Manual, September 2006, 2nd version, p. iii.

III. Conclusion

The Street Rehabilitation Program is tasked with providing the resources needed for the systematic repair and resurfacing of streets throughout the City. To ensure the City's roadways are properly maintained, program operations must be well managed and efficient.

The audit revealed several opportunities for the program to enhance its current process and improve performance. This includes creating a long-term strategic plan, re-evaluating the 100 lane-mile goal, drafting a SOP, establishing a contingency plan for preventative maintenance, and streamlining communication between DOTE and City departments.

IV. Department of Transportation and Engineering Response

Recommendation 1: Create a long-term strategic plan to ensure proper funding is secured to meet the program needs.

Department Response: Agree. A comprehensive plan including alternative funding has been established. The department will look for outside funding sources to meet the funding gap as stated in the budget document and will be re-evaluated every 6 months. The department recommends a complete city-wide infrastructure review should be conducted, similar to the Smale Commission from 1987, to help determine appropriate funding levels.

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