City of Phoenix

Mission Statement

To improve the quality of life in Phoenix through efficient delivery of outstanding public services.

Street Transportation Department
Street Maintenance

December 4, 2024

Report Highlights

Work Requests

Work requests were appropriately routed and approved; however, not all work requests were charged in SAP.

Performance Metrics

The Street Transportation Department should define performance metrics, such as turnaround times for work requests.

Pavement Preservation

The Street Transportation Department applied the appropriate treatment based on the pavement condition index rating.

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Project Number

#1240040

This report can be made available in alternate format upon request.

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Executive Summary

Purpose

Our purpose was to verify controls are in place to ensure maintenance on existing street infrastructure complies with Street Transportation Department (Streets) policies.

Background

The Street Maintenance Division, the largest division within Streets, is tasked with maintaining the City's roadways and other right-of-way assets. Street Maintenance oversees the City's pavement preservation program, landscape maintenance, and tree replacement program. Additionally, it manages all City bridges, dams, and levees. The maintenance staff handles asphalt and pothole repairs, street sweeping, debris removal, street resurfacing, weed removal in unimproved areas, alley grading and dustproofing, and responds to storm-related issues like flooded streets, clogged storm drains, and wash maintenance.

We tested street maintenance work requests performed in various categories queued through the Citizenserve application. The Citizenserve application enables Streets staff to receive, manage, and assign work requests. Citizenserve is interfaced with the City's public facing service request portal, myPHX311, which routes concerns directly to the Street Maintenance Division.

Additionally, we analyzed the process for pavement preservation prioritization. Streets uses a pavement management software to determine which streets will receive pavement overlays or other street preservation methods. This system relies on data collected by the Automated Road Analyzer (ARAN), a vehicle equipped with sensors that assesses road conditions. ARAN evaluates surface roughness, environmental stresses, and structural integrity, generating a pavement condition index (PCI) rating from 0 to 100 (worst to best). Streets staff then uses these PCI ratings to create an initial list of street preservation projects.

Results in Brief

Work requests were appropriately routed and completed; however, not all requests were charged in SAP.

We reviewed a sample of service requests and found they were all appropriately routed and completed. However, we could not find the work for 11 service requests billed in SAP, or determine why they were not in SAP. When a work request is not in SAP, it may mean that work was performed and not appropriately billed. Reconciling service requests and work orders in SAP ensures that all requests are appropriately billed. Per staff, there were several situations that may cause work requests not to be entered into SAP, such as duplicate service requests and timing.

Streets should define performance metrics such as turnaround times based on request type.

Streets policies and procedures do not define metrics to evaluate performance such as work request cycle times or documentation levels required for Citizenserve. Each work request was populated with a specified deadline for completion which indicated management involvement; however, the duration of the cycle time differed between some work requests within the same category. Management and staff need to know criteria defining the metrics of the functions they are performing to have a basis for evaluation. In addition, documentation of required procedures will improve compliance with rules and regulations of the work request function and help establish a consistent process.

Streets applied the appropriate treatment based on the PCI in accordance with its criteria.

For fiscal years 2022, 2023, and 2024, the maximum PCI of any street that received an overlay was 51.7, 76.68, and 66.9 respectively. Except for 2023, these would fall into the fair condition range. The average PCI of streets receiving overlay was 31.6, 37.52, and 34.2 for each year respectively. These PCI indexes are considered poor condition on the PCI Criteria Chart, and aligns with expectations based on Streets' written criteria.

Department Responses to Recommendations

Rec. #1.1: Implement a process to ensure that Citizenserve service requests are appropriately billed through SAP.	
***Response*:** The Street Transportation Department will implement a process to ensure that Citizenserve service requests are appropriately billed through SAP when the service request requires that time be charged.	***Target Date*:** March 4, 2025
Rec. #1.2: Develop and document performance metrics for work requests in Citizenserve, such as prescribed cycle times and documentation requirements.	
***Response*:** The Street Transportation Department will develop and document performance metrics for work requests in Citizenserve, such as prescribed cycle times and documentation requirements.	***Target Date*:** March 4, 2025

1 – Street Maintenance Work Requests

Background

The Street Maintenance Division uses an application called Citizenserve to receive, manage, and assign work requests for sidewalk repairs, asphalt and pothole repairs, removal of debris blocking roadways, removal of weeds in unimproved right-of-ways, alley work, responding to storm related issues such as flooded streets and clogged storm drains, and wash maintenance. Citizenserve interfaces with the City's public facing service request portal, myPHX311, which routes concerns directly to the Street Maintenance Division. For the period January 1, 2022 through June 30, 2024, approximately 50,000 work requests were addressed by Street Maintenance. The top five categories of work requests were as follows:

Citizenserve Top 5 Street Maintenance Categories

Category	Description	Quantity
Rapid Responder	Emergency roadway maintenance or debris blocking the roadway.	18,122
PHX At Your Service	General street complaints, maintenance needed in right-of-ways.	10,411
Drainage	Clogged street drainage and cleaning.	6,502
Asphalt	Rough pavement, cracks in street.	5,459
Concrete	Sidewalk/curb repair and maintenance.	2,571
Total		**43,065**

Street Maintenance work requests encompassed a variety of street-related concerns.

We tested to determine if Citizenserve work requests were correctly routed to the appropriate team, that each completed work request was approved by a foreman or supervisor, and that each work request was billed to the appropriate Street Maintenance accounts in SAP.

Results

Citizenserve work requests were correctly routed to the appropriate team, and properly approved by a supervisor/foreman.

We randomly selected a sample of 25 work requests from Citizenserve between January 1, 2022 through June 30, 2024. Each work request was reviewed for routing to the appropriate team based on the category of the work request, and we reviewed the history in Citizenserve to determine if a supervisor/foreman inspected the completed work and signed off the work request. All the work requests sampled were routed to the appropriate party to address the concern, and all but one of the work requests were inspected and signed off by a foreman/supervisor. The single work request that was not signed-off was in the Rapid Responder category which involved removing debris in the roadway. The finished work request included a photo of the completed work depicting the debris moved out of the roadway.

We could not ensure that all Citizenserve work requests were appropriately charged in SAP.

We tested 25 work requests. We could not find 11 in SAP, or determine why they were not in SAP. The remainder of the sample was traced to SAP without exception. When a work request is not in SAP, it may mean that work was performed and not appropriately billed. Reconciling service requests and work orders in SAP ensures that all requests are appropriately billed. Per staff, there were several situations that may cause work requests not to be entered into SAP:

- The process for identifying work requests as unique versus duplicate is a manual process which can be prone to errors.
- The timeliness of entering work requests in SAP could create a gap between when an SAP report is run and when a work request is entered in SAP. Streets does not have a documented timeliness requirement for booking work requests in SAP.
- Incorrect or incomplete linking of work requests in Citizenserve may lead to unnecessary repeat inspections of completed work.

Work orders are manually entered into SAP only after verification by a foreman, who inspects and confirms that the work has been completed. The foreman closes the work order in Citizenserve and records it in a daily log, which staff then uses to input the work request into SAP. If a work request is determined to be a duplicate or if no work was required, it will not be entered into SAP. The Department recognizes that improvements need to be made to better track the work orders.

Streets should define performance metrics for turnaround times based on request type.

Streets policies and procedures do not define metrics to evaluate performance such as work request cycle times or documentation levels required for Citizenserve. Each work request was populated with a specified deadline for completion which indicated management involvement; however, the duration of the cycle time differed between

some work requests within the same category. Rapid Responder was the most frequently occurring category, with a cycle time of less than two days. The Asphalt Repair category took the longest to complete with an average cycle time of 129 days. Management and staff need to know criteria defining the metrics of the functions they are performing to have a basis for evaluation. In addition, documentation of required procedures will improve compliance with rules and regulations of the work request function and help establish a consistent process.

Recommendations

1.1 Implement a process to ensure that Ctizenserve service requests are appropriately billed through SAP.

1.2 Develop and document performance metrics for work requests in Citizenserve, such as prescribed cycle times and documentation requirements.

2 – Pavement Preservation Prioritization

Background

The City maintains more than 4,850 miles of public streets. The Street Maintenance Division is responsible for the planning, programming, and execution of the City's Street Maintenance program. This involves maintaining all roadways within the City's jurisdiction limits but excludes private streets, state routes maintained by Arizona Department of Transportation (ADOT), or roads maintained by Maricopa County.

Starting in spring the Street Maintenance Division performs annual routine street maintenance activities to keep the City's street network in a usable state and extend its lifespan. The work to repair and improve streets ranges from less complex pothole patching to more involved projects like resurfacing and reconstruction.

To determine the order and priorities of which streets will receive pavement preservation, Streets uses a pavement management system that measures the condition of the street. This methodology is summarized in a five-year plan, the most recent of which started in 2019. As of 2024, the plan is 91.4% complete. The foundation of that methodology is data obtained using a pavement management vehicle equipped with special sensors, the Automated Road Analyzer (ARAN). ARAN measures and records the condition of roads, evaluating them on surface roughness, environmental stresses, and structural condition. Based on the resulting pavement condition index (PCI) rating, which is measured 0-100 (worst to excellent), staff develops an initial list of roads to receive pavement preservation.

Pavement Condition Index (PCI) Criteria Chart

PCI is based on a scale from 0-100.

Once the list is developed, the initial list of roads is put through a coordinated review, which includes evaluating the following:

- Coordination or conflicts with other City projects.
- Right-of-way concerns.
- Environmental issues.
- Utility issues or conflicts.
- Field visual inspections.
- Pavement age.
- Roadway traffic volumes.
- Alternate treatments.
- Economic and community impacts.

We analyzed the PCI for streets prior to 2021 and compared the index to projects performed in calendar years 2022, 2023, and 2024 to verify that streets receiving pavement preservation were in a state of condition that matched the level of preservation it received.

Results

Streets pavement preservation prioritization appeared to properly consider the PCI and apply the appropriate treatment based on its criteria.

The Streets pavement prioritization process is based on PCI. PCI data is uploaded to the Deighton Total Infrastructure Management System (dTIMS). The dTIMS software analyzes collected pavement condition data from the ARAN to determine appropriate pavement preservation treatments based on a computed PCI. PCI considers structural, environmental and roughness factors for each street section. The dTIMS forms the basis of the decisions for pavement preservation methods by recommending various treatments for roads over an analysis period.

Treatment types are assigned to each street section based on the current pavement condition and available budget. Streets that are analyzed and determined to be in good condition must still be maintained to ensure they last. Different treatments are appropriate for streets in various states of condition, but these are classified into two broad categories: resurfacing or overlay. In general, resurfacing is the least expensive treatment type and can be appropriate for all street conditions but is reserved mainly for streets in fair condition or better.

We compared the average PCI for road preservation to the standards defined by Streets and found that roads were appropriately preserved based on their PCI score.

Average PCI for Streets Receiving Preservation Work

Preservation Type	2022	2023	2024
Overlay	31.6	37.5	34.2
Resurfacing	40.3	40.4	45.7

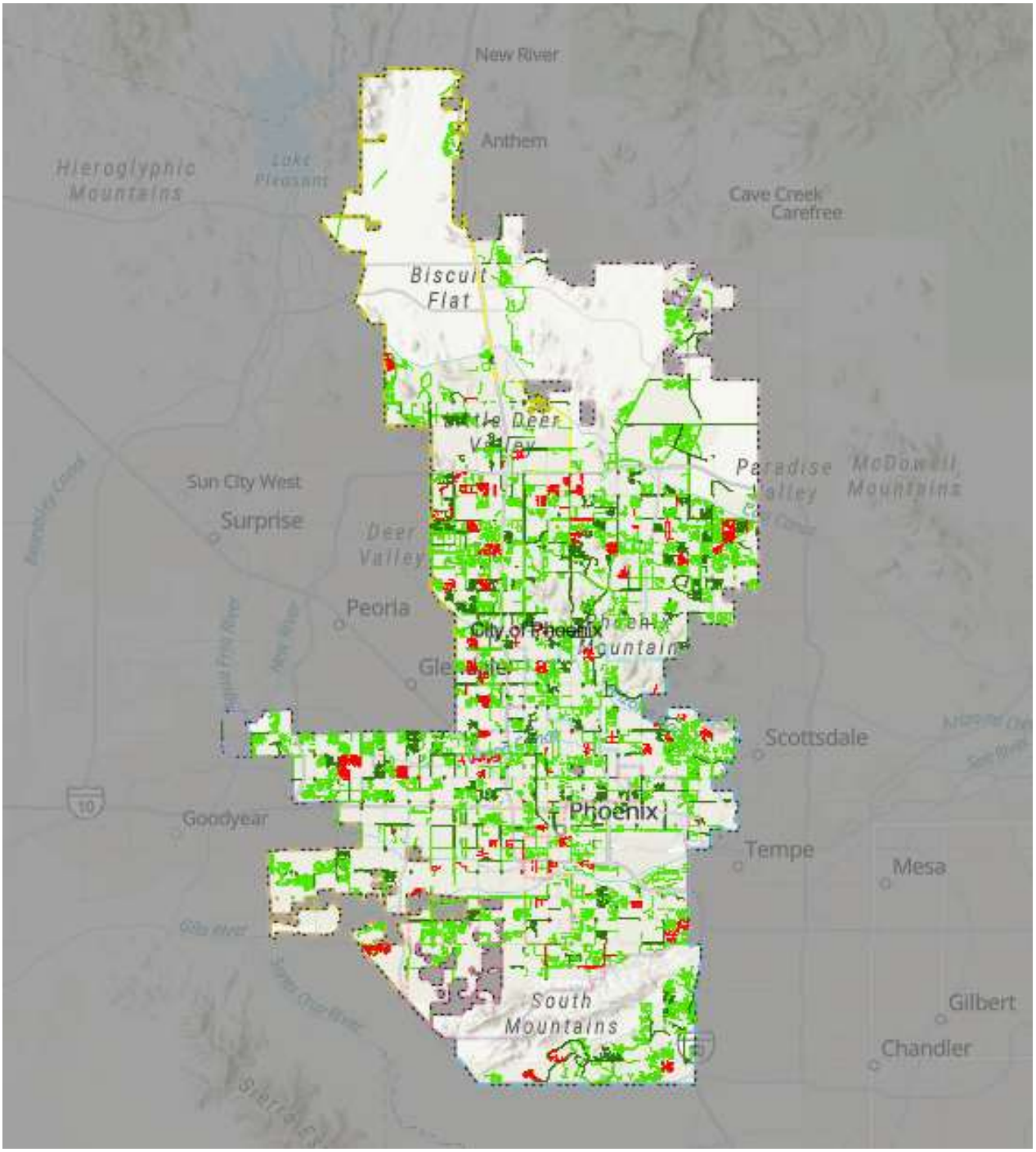
The average PCI of streets that received overlay work was rated poorer than streets that received resurfacing work.

Recommendations

None

Attachment A – Map of Phoenix Street Projects Completed and Planned

Completed projects are in green, planned projects are in red.



Scope, Methods, and Standards

Scope

This audit encompassed street maintenance activity occurring from January 1, 2022 through June 30, 2024.

The internal control components and underlying principles that are significant to the audit objectives are:

- Control Environment
    - Management should evaluate performance and hold individuals accountable for their internal control responsibilities.
- Control Activities
    - Management should design control activities to achieve objectives and respond to risks.
- Information and Communication
    - Management should use quality information to achieve the entity's objectives.
- Monitoring Activities
    - Management should remediate identified internal control deficiencies on a timely basis.

Methods

We used the following methods to complete this audit:

- We interviewed Streets management and staff.
- We reviewed Streets policies, procedures, and other documents.
- We tested maintenance work requests.
- We analyzed pavement preservation projects.
- We performed data validation procedures on Citizenserve.

Unless otherwise stated in the report, all sampling in this audit was conducted using a judgmental methodology to maximize efficiency based on auditor knowledge of the population being tested. As such, sample results cannot be extrapolated to the entire population and are limited to a discussion of only those items reviewed.

Data Reliability

We assessed the reliability of Citizenserve and SAP data by (1) performing electronic testing, (2) reviewing existing information about the data and the system that produced

them, and (3) interviewing agency officials knowledgeable about the data. We determined that this data was sufficiently reliable for the purposes of this 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. Any deficiencies in internal controls deemed to be insignificant to the audit objectives but that warranted the attention of those charged with governance were delivered in a separate memo. We are independent per the generally accepted government auditing requirements for internal auditors.