



# Audit of Road Paving Improvements and Maintenance

February 11, 2022

Mark S. Swann, City Auditor

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# Executive Summary

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## Objective and Scope

The objective of this audit was to determine if the Department of Public Works' Road Pavement Management Program appropriately solicits, monitors, and inspects road pavement activities to ensure quality and timely work is performed.

The audit scope included an evaluation of road pavement improvement projects completed by two contractors from 2019 through 2020.

## What We Recommend

We recommend the Department of Public Works:

- Improve quality control and monitoring for timely completion of all road pavement activities.
- Develop a centralized method of tracking all road pavement activities and storing project documentation.
- Ensure consistent verification of project costs.
- Monitor and evaluate root causes for cost overages.
- Ensure compliance with Administrative Directive 4-05, *Contracting Standards and Procedures (Interim)* for attestation requirements and evaluation of bidders.

## Background

The City of Dallas Department of Public Works' responsibilities include the design, construction, and maintenance of the City's mobility infrastructure in the City's right-of-way. The department contracted with two external contractors to perform various road pavement and improvement activities from 2019 through 2021 for nearly \$289 million. (See [Appendix A](#) for details).

The Office of the City Auditor completed an *Audit of the Paving and Maintenance Program/Capital Program Streets and Thoroughfares* in Fiscal Year 2015, with a follow-up audit issued in 2017. The follow-up audit concluded that unmet inspection requirements, lack of documentation to demonstrate work was performed, and inconsistent and unreliable use of project management systems remained a concern.

## What We Found

Recurrent observations related to road pavement maintenance and improvement monitoring and inspection activities persist:

- Projects are not consistently monitored and inspected for quality and timely performance.
- Project information is not centralized or reliable.

In addition, project expenditures are not consistently verified, and cost overages occur without a documented explanation.

While the Department of Public Works generally solicits road pavement and improvement activities in accordance with bid protocols, requirements of Administrative Directive 04-05, *Contracting Standards and Procedures (Interim)* were not followed, such as evaluation of contractor experience and financial capability.

## Objectives and Conclusions

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1. Does the Department of Public Works Road Construction Management Program appropriately solicit road pavement activities to contractors to ensure quality and timely work is performed?

**Generally, Yes.** The Department of Public Works generally adhered to bid protocols as specified in the Request for Proposals to bid road pavement activities. However, there is no evidence that contractor experience, financial capability, and safety and environmental records were verified. In addition, attestation requirements of Administrative Directive 4-05, *Contracting Standards and Procedures (Interim)* were not followed. See [Observation E](#).

2. Does the Department of Public Works Road Construction Management Program appropriately monitor and inspect road pavement activities performed by contractors to ensure quality and timely work is performed?

**No.** The Department of Public Works does not consistently document the performance of monitoring, inspection, and other project management tasks to ensure quality and timely completion of road paving repair and maintenance activities. Project documentation reviewed did not contain evidence of:

- Quality control activities, such as compression strength testing.
- Final inspection activities.
- Consistent progress reporting to ensure assessment of materials and equipment used at the project site.
- Use of construction schedules to monitor timeliness of work completed.

In addition, pavement maintenance and road resurfacing project information and tracking are not centralized or reliable and stored project documentation is not organized or readily available for retrieval. Furthermore, project expenditures are not consistently verified, and cost overages occur without a documented explanation. See [Observation A](#), [Observation B](#), [Observation C](#), and [Observation D](#).

## Audit Results

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Both *City Council Resolution 88-3428* and Administrative Directive 4-09, *Internal Control* prescribe policy for the City to establish and maintain an internal control system. The audit observations listed are offered to assist management in fulfilling their internal control responsibilities.

### Observation A: Road Pavement Project Management

The Department of Public Works does not consistently document the performance of monitoring, inspection, and other project management tasks to ensure quality and timely performance of road paving repair and maintenance activities. In addition, the Department of Public Works does not have a centralized method of tracking road pavement activities or organizing road pavement project documentation. As a result, the Department of Public Works may not ensure (1) contractors' performances meet departmental objectives for quality road pavement activities that would prevent failure of roads prematurely; or, (2) road paving repair and maintenance activities are completed timely and according to the specifications prescribed in the requests for proposal, contracts and the *City of Dallas 2011 Addendum to the Public Works Construction Standards – North Central Texas* as published by the North Central Texas Council of Governments in October 2004 (*COD 2011 Addendum*)<sup>1</sup>.

Road pavement activities are not consistently monitored and inspected for timely, quality completion at each critical phase, such as: (1) required concrete repairs, (2) milling, (3) underseal, (4) overlay, and (5) pavement markings. For example, per the *COD 2011 Addendum* and requests for proposal, the Department of Public works personnel are directed to perform various quality tests, "Punchlist" walk-throughs, and use progress reports, construction schedules, and other forms to ascertain whether work performed was in accordance with requirements and intent of plans, specifications, and climatic restrictions. However, the documentation of required monitoring activities is either missing or incomplete.

Specifically,

- **Pavement maintenance and road resurfacing project files do not contain evidence of quality control testing.** Only one of 16 randomly selected project files includes evidence of required compression strength testing.
- **Pavement maintenance and road resurfacing project files do not contain evidence of final inspection activities.** None of the 16 randomly selected project files include evidence of a required final "Punchlist" walk-through or a written verification that an inspection was not needed in the sampled project. According to the Department of Public Works, due to limited

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<sup>1</sup> The *COD 2011 Addendum* sets requirements specific to the City of Dallas Department of Public Works and takes precedence over requirements of the North Central Texas Council of Governments Public Works Construction Standards. These standards provide specifications for the proposal and award of contract, control of work and materials, site protection and preparation, roadway construction and maintenance, and other items related to Public Works construction activities.

resources, inspection activities are prioritized based on street classification, and all projects are inspected after completion to ensure quality of work. Evidence of final inspection activities were not provided with the project files.

- **Daily progress reports are inconsistently used, incomplete, and lack detail to ensure inspectors assess materials and equipment used by the contractors.** Only four of 16 randomly selected pavement maintenance and road resurfacing project files contained daily progress reports. These reports should provide information regarding project status, including: a detailed analysis of the activities performed; weather and site conditions; safety precautions, quality concerns and potential risks; and, a resources summary in the form of labor, equipment, and material.

The daily progress reports available for auditors' review:

- Were not filled out completely. For example, materials testing, contract time, and details regarding contractors' personnel and equipment use were not provided.
  - Did not have information about what assessment was used to conclude that adequate materials and equipment were used for mixing, aerating, compacting, etc.
- **Construction schedules required by the *COD 2011 Addendum* are not used.** Of the 16 randomly selected pavement maintenance and road resurfacing project files, none included a project construction schedule with the level of detail that would allow staff to monitor the timeliness of work performed at each critical phase of the project.

These inconsistencies exist because the Department of Public Works does not have written procedures that specify the frequency, timing, or location of quality control testing. In addition, the Department of Public Works does not have procedures to ensure that quality and timeliness of monitoring activities and their results are documented, reviewed and approved by management, and retained.

## Criteria

- ❖ Standards for Internal Control in the Federal Government
  - *Principle 10 – Design Control Activities*
  - *Principle 16 – Perform Monitoring Activities*
- ❖ City of Dallas 2011 Addendum to the Public Works Construction Standards – North Central Texas, as published by the North Central Texas Council of Governments, Sections:
  - 105.9, *Inspection* – requires a written verification, from the Department of Public Works Construction Supervisor, for any work not needing an inspection before proceeding with a particular item of work.
  - 107.19.3.3.2, *Daily Inspections* – requires a daily inspection of excavations prior to start of work and as needed throughout the shift.
  - 108.1, *Construction Schedule* – requires a detailed construction schedule outlining the major items of work on the project that must be submitted monthly.

- 301.1, *Equipment* – requires that all equipment be approved as to condition before the contractor is permitted to begin construction operations.
  - 303.8, *Standard Classes of Concrete Test Cylinders* – requires testing of materials and pavement strength tests.
  - 301.3, *Construction Quality Control Program* – requires testing of materials, pavement thickness, or pavement strength as part of a quality assurance program.
  - 404.3.1, *Laboratory Evaluation* – requires lab evaluation of exact materials used at least during the calendar year, for maintenance projects.
- ❖ The *2017 Capital Bond Request for Proposal* requires a final “Punchlist” walk-through inspection on a project-by-project basis.
  - ❖ The *36-Month Maintenance & Street Improvements Projects FY2020-2022* requires a final “Punchlist” walk-through inspection on a project-by-project basis.

Assessed Risk Rating:

**High**

We recommend the **Director of the Department of Public Works**:

- A.1:** Revise and implement department procedures to specify the frequency, timing, and location of quality control testing for all pavement maintenance and road resurfacing projects.
- A.2:** Revise and implement department procedures to ensure that quality and timeliness of monitoring activities and their results are documented, reviewed and approved by management, and retained.
- A.3:** Update the progress report form to an electronic format and include a checklist for inspectors to assess construction site aspects in accordance with the *City of Dallas 2011 Addendum to North Central Texas Council of Governments, Public Works Construction Standards Sections 107.19.3.3.2, 107.19.3.3.3, 108.2.1 and 404.3.1.1, 404.3.3.1, 504.5.3.2, 702.4.2.*
- A.4:** Ensure inspectors consistently complete all sections of the updated progress report form.
- A.5:** Ensure that daily schedules include construction start dates, end dates, the current milestone being worked on, and the treatment type being used.

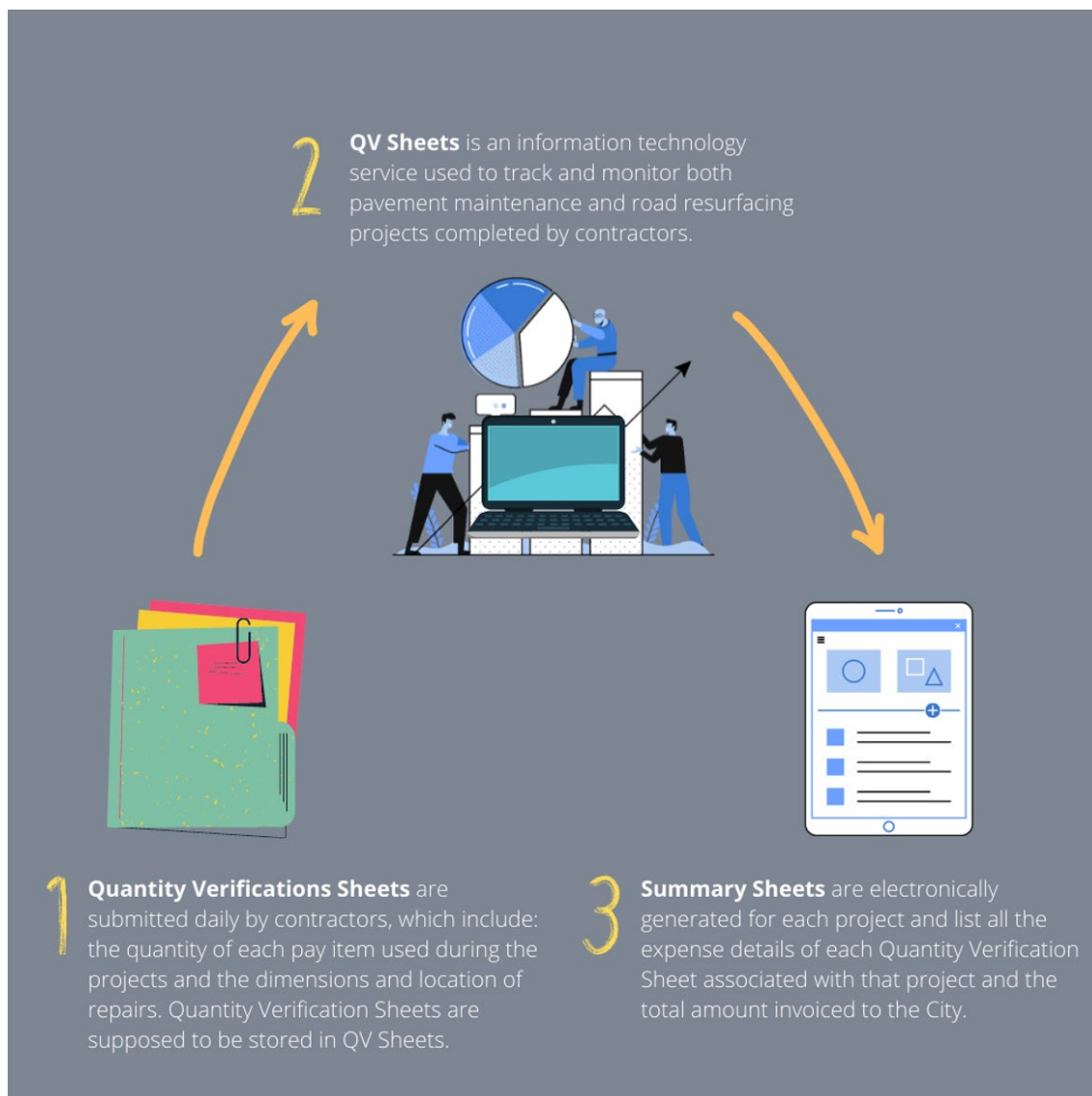
## Observation B: Project Expenditures

The Department of Public Works personnel do not consistently document and review quantities of materials invoiced for pavement maintenance and road resurfacing projects. As such, there is an increased risk of fraudulent activities or improper payment to contractors.

The Department of Public Works personnel are supposed to use *Quantity Verification Sheets*, *QV Sheets*, and *Summary Sheets* for documentation as described in [Exhibit 1](#) below:

### Exhibit 1:

#### Project Expenditure Verification Systems Used by the Department of Public Works



**Source:** Department of Public Works' project documentation; graphic created by the Office of the City Auditor



Review of project documentation for 16 randomly selected pavement maintenance and road resurfacing projects<sup>2</sup> noted the following:

- None of the five pavement maintenance project files included *Quantity Verification Sheets* or evidence that Department of Public Works personnel reviewed and approved quantities invoiced. As such, management cannot ensure validity of quantities invoiced per the *Summary Sheets*.
- Of the eleven road resurfacing project files, only two included the *Summary Sheets*. Without tracking all project expense detail in a centralized method, management cannot ensure completeness of quantities invoiced from the *Quantity Verification Sheets*.
  - Of the two projects that included *Summary Sheets*, documentation for one project file (PB17V953H) was missing *Quantity Verification Sheets* to support the total materials invoiced. Specifically, the total quantity supported by *Quantity Verification Sheets* for 10-inch thick reinforced concrete pavement was 2,009.44 square yards. However, 5,042.38 square yards were invoiced per the *Summary Sheet*, more than double the quantity supported. This amounts to more than \$200,000 in potential overbilling to the City.

#### Criteria

- ❖ City of Dallas 2011 Addendum to the Public Works Construction Standards – North Central Texas, as published by the North Central Texas Council of Governments, Section 109.5.1, *Monthly Estimate*
- ❖ Standards for Internal Control in the Federal Government,
  - *Principle 10 – Design Control Activities*
  - *Principle 16 – Perform Monitoring Activities*
  - *Principle 17 – Evaluate Issues and Remediate Deficiencies*

Assessed Risk Rating:

**High**

We recommend the **Director of the Department of Public Works**:

**B.1:** Ensure consistent use of *Quantity Verification Sheets* for all road pavement projects to facilitate review and validation of quantities of materials invoiced.

**B.2:** Ensure consistent use of *Summary Sheets* or another documented, centralized method to verify completeness and accuracy of all quantities validated by the *Quantity Verification Sheets*.

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<sup>2</sup> Three pavement maintenance and road resurfacing project files were not provided by the Department of Public Works.

**B.3:** Determine the amount of overbilling for project PB17V953H and recoup overpayment from the contractor.

## Observation C: Project Cost Overages

Of the sixteen randomly selected pavement maintenance and road resurfacing project files, six were completed with significant cost overages without the reason for the overages documented in the project files. As such, management cannot evaluate the systemic causes of project cost overages because management does not monitor and evaluate root causes for cost overages to enhance accuracy and reasonableness of future cost estimations for road pavement projects.

### Pavement Maintenance Project Overages

- Estimated Costs – Combined estimated costs for pavement maintenance projects Denham, Rancho, Murdock, and Big Thicket totaled \$391,772.
- Total Expenditures – The total expenditures for all four completed projects were \$885,093, or \$493,301 over the estimated costs.

### Road Resurfacing Project Overages

- Estimated Costs – Combined estimated costs for road surfacing projects PB17V953 and PB17V514 totaled \$309,878.
- Total Expenditures – The total expenditures for both completed projects were \$764,946, or \$455,068 over the estimated costs.

### Total Project Overages

Cost overages for projects completed by the two contractors totaled \$15,554,244, or 12 percent over the total estimated cost. (See [Exhibit 2](#) on page 10) Public Works does not document the reasons for project cost overages and does not monitor and evaluate root causes for cost overages to enhance accuracy and reasonableness of cost estimations for road pavement projects.

**Exhibit 2:**

Completed Project Cost Analysis as of October 28, 2021

Contract	Contractor	Activities	Estimated Cost	Actual Cost	— Variance —	
					Dollar	%
2019 Street Resurfacing & Street Improvements for the 2017 Capital Bond Program	Texas Materials, Inc.	Road Resurfacing	\$52,406,624	\$49,811,418	-\$2,595,206	
36-Month Street Resurfacing & Improvements for the 2017 Capital Bond Program	Heritage Materials, LLC	Road Resurfacing	\$21,590,857	24,019,096	\$2,428,239	
36-Month Maintenance and Street Improvements	Heritage Materials, LLC	Pavement maintenance	\$51,106,501	66,827,712	\$15,721,211	
<b>Total</b>			<b>\$125,103,982</b>	<b>\$140,658,226</b>	<b>\$15,554,244</b>	<b>12%</b>

**Source:** Department of Public Works Completed Projects Data as of October 28, 2021.

Criteria

- ❖ Standards for Internal Control in the Federal Government,
  - *Principle 10 – Design Control Activities*
  - *Principle 16 – Perform Monitoring Activities*
  - *Principle 17 – Evaluate Issues and Remediate Deficiencies*

Assessed Risk Rating:

**Moderate**

We recommend the **Director of the Department of Public Works:**

- C.1:** Ensure the reasons for project cost overages are documented in the project files.
- C.2:** Monitor and evaluate root causes for cost overages to enhance accuracy and reasonableness of cost estimations for road pavement projects.

## Observation D: Project Tracking and Document Organization

Pavement maintenance and road resurfacing project information is not centralized or reliable; and, stored project documentation is not organized or readily available for retrieval. As a result, management cannot ensure an accurate understanding or proper reporting of project status and lapses in required permitting occur (see [page 12](#)).

Specifically, the Department of Public Works does not have a centralized method of tracking pavement maintenance and road resurfacing projects and does not follow a systematic process for storing and retrieving pavement maintenance and road resurfacing project documentation.

In fact, the Department of Public Works uses three incompatible information technology systems, as well as paper documentation outside of the systems, to track and monitor pavement maintenance and road resurfacing projects (see [Exhibit 3](#) on page 12):

- *GEO* is used to track the status of pavement maintenance projects.
- *Tririga* is used to track the status of road resurfacing projects.
- *QV Sheets* is used to track and monitor both pavement maintenance and road resurfacing projects completed by contractors.
- Paper documents are stored in boxes that may also be used to track and monitor pavement maintenance and road resurfacing projects completed by contractors.<sup>3</sup> Three of 16 randomly selected project files were stored in the boxes and were not provided by the Department of Public Works.

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<sup>3</sup> According to Department of Public Works personnel, the department was using a paper form of *QV Sheets* before an electronic form of *QV Sheets* was implemented during the current contract period beginning September 2019.

**Exhibit 3:**



**Source:** Office of the City Auditor, process walk-through with Department of Public Works management

These tracking systems do not interface with each other, and management does not have controls in place to ensure consistency of pavement maintenance and road resurfacing projects details in the systems. Important dates for pavement maintenance and road resurfacing projects, such as the scheduled start and finish dates, are inconsistent, not indicated, or do not match supporting documentation. For example,

- One road resurfacing project was listed as complete with start and finish dates between June 30, 2020 through July 24, 2020, in *QV Sheets*. However, dates listed in *Tririga* specify October 1, 2020 through September 30, 2021, indicating that the project is still ongoing.
- One pavement maintenance project was listed as complete with start and finish dates between April 25, 2020 through June 19, 2020, in *QV Sheets*, and April 28, 2020 through May 11, 2020, in *GEO*.

Confusing project status information has led to multiple construction permits lapsing the pavement maintenance and road resurfacing projects start and completion dates. Permit details from the City's Right-of-Way document system indicate that:

- Permits for nine pavement maintenance and road resurfacing projects reviewed expired before the projects were completed.
- A permit for one pavement maintenance and road resurfacing project reviewed was obtained after construction on the project began.
- A permit was not obtained for two pavement maintenance and road resurfacing projects reviewed.

## Criteria

- ❖ Standards for Internal Control in the Federal Government,
  - *Principle 10 – Design Control Activities*
  - *Principle 11 – Design Activities for the Information System*
  - *Principle 16 – Perform Monitoring Activities*
- ❖ Dallas City Code, Chapter 43, Streets and Sidewalks, Sections:
  - 43-49, *Construction Permit – Required*
  - 43-42, *Construction Permit – Expiration; New Permit Required Before Recommencing Work*
  - 43-139, *Permit Required; Exceptions; Conditions; Denial and Revocation*

Assessed Risk Rating:

**Moderate**

We recommend the **Director of the Department of Public Works:**

- D.1:** Develop and implement a method to track construction permit status and expiration to ensure compliance with Dallas City Code.
- D.2:** Develop specifications for a new or upgraded centralized system to accurately track the status of all pavement maintenance and road resurfacing projects.
- D.3:** Ensure that pavement maintenance and road resurfacing project information included in the new or upgraded centralized tracking system is consistent and reliable.
- D.4:** Develop a systematic process for storing and retrieving road pavement project documentation.

## Observation E: Solicitation Requirements

While the Department of Public Works generally adhered to bid protocols as specified in the Requests for Proposals to bid road pavement activities, there is no evidence that contractor experience, financial capability, and safety and environmental records were verified. In addition, attestation requirements of Administrative Directive 4-05, *Contracting Standards and Procedures (Interim)* were not followed.

Without proper contractor evaluation during the solicitation process, there is an increased risk that the contractor could fail to meet program objectives for road pavement activities or default on contractual requirements. Furthermore, failure to obtain assurances from an independent attestation could result in decreased quality and effectiveness of the department's solicitation process.

### Solicitation Documents

There is no evidence that the Department of Public Works evaluated bidding contractors' experience, financial capability to perform all planned road pavement projects, and environmental and occupational safety records. In addition, the following required solicitation documents are not included with the bidding files for the 13 project files reviewed:

- Resumes of key personnel assigned to work on the projects.
- Records of prior contractor experience and references.
- *Form 7-Bid Bond*, to help guarantee that the bidding contractor is financially stable and has the necessary resources to take on all projects.

Department of Public Works personnel did not follow its two 36-Month bid proposals or Administrative Directive 4-05, *Contracting Standards and Procedures (Interim)*, for bidder evaluation.

### City Auditor Attestation

The Department of Public Works did not follow Administrative Directive 4-05, *Contracting Standards and Procedures (Interim)* requirement to request a City Auditor attestation to obtain the following assurances:

- Information communicated to potential bidders was accurate and complied with City ordinances and state statutes.
- Confirmation that the bid specifications promote competition and competitive pricing.
- Confirmation that the Department of Public Works performed due diligence when developing the bid specifications by consulting with other departments, such as the City Attorney's Office, and documenting the consultation.
- Confirmation that the Department of Public Works evaluated bids and found them to meet the minimum requirements for low bid or that the most advantageous proposer was determined based on the published evaluation criterion.



Administrative Directive 4-05, *Contracting Standards and Procedures (Interim)* requires an attestation engagement for all construction projects with an estimated contract award of \$50 million or greater.

## Criteria

- ❖ Administrative Directive 4-05, *Contracting Standards and Procedures (Interim)*,
  - *Section 9.5.5* states, “the City Auditor must complete an attestation engagement for all construction projects with an estimated contract award of \$50 million and greater, prior to scheduling the agenda item for City Council consideration.”
  - *Section 10.6.4* specifies the minimum standard to be considered in the contracting process, including: experience with similar projects, past performance, financial capability and business practices, and proposed work plan.
- ❖ *36-Month Maintenance and Street Improvements Project FY 2020-2022* and the *Bond 36-Month Street Resurfacing and Street Improvement Project FY 2020-2022* Requests for Proposal:
  - Section A.18, *Bidder Evaluation*, requires evaluation of financial capability, experience, safety and environmental record, and prior performance.
  - Section A.29, *Forms Section*
- ❖ 2018 Government Auditing Standards, Foundation and Principles for the Use and Application of Government Auditing Standards, Section 1.18, *Attestation Engagements and Reviews of Financial Statements*.

Assessed Risk Rating:

**Moderate**

We recommend the **Director of the Department of Public Works**:

**E.1:** Ensure department personnel follow Administrative Directive 4-05, *Contracting Standards and Procedures (Interim)* for evaluation of bidders.

**E.2:** Ensure department personnel follow Administrative Directive 4-05, *Contracting Standards and Procedures (Interim)* for attestation requirements.

## Appendix A: Background and Methodology

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### Background

The Department of Public Works' mission is to maintain and enhance the condition and safety of Dallas streets, alleys, and sidewalks while promoting innovative, "Service First" solutions and a high quality of life for all the City's residents, businesses, and visitors. The Department of Public Works' responsibilities include the design, construction, and maintenance of the City's mobility infrastructure in the City's right-of-way.

The Road Pavement Management division of the department collects data about the condition of approximately 11,800 lane miles of streets and alleys. They also analyze the data to identify current and future pavement conditions in support of street maintenance and capital improvement programs. To accomplish this work, the department contracted out various pavement maintenance and road resurfacing projects from 2019 through 2021 for nearly \$289 million.

### Infrastructure Management Plan

The Department of Public Works publishes its *Five-Year Infrastructure Management Plan* that describes the priorities and funding for streets, sidewalks, and alleys. The Infrastructure Maintenance Plan is updated annually based on infrastructure condition assessments and available budgets. Typical work performed on road pavement projects involves either preservation or pavement maintenance and road resurfacing:

1. Preservation is utilized on asphalt streets with a PCI rating of a 60-70, a high "C" condition with the goal of slowing deterioration that would require more expensive repair work. Slurry seal, a type of treatment that seals and smooths surfaces and conceals scars from previous work, is primarily used in residential areas. This type of work was not evaluated during this audit.
2. Pavement maintenance and road resurfacing work consists of more substantial repairs on streets that have deteriorated to beyond the need of preservation treatment. This is also used to seal and smooth surfaces and conceal scars from previous work but is mostly used in high-traffic areas. This type of work was evaluated during the audit. Examples of pavement maintenance and road resurfacing activities include:
  - Full depth asphalt
  - Partial reconstruction
  - Rehabilitation
  - Restoration
  - Asphalt over concrete

## Contractors

Solicitation, monitoring, and inspection of pavement maintenance and road resurfacing activities performed by two contractors were evaluated during the audit.

### Heritage Materials, LLC

In September 2019, Heritage Materials, LLC. entered the *36-Month Maintenance and Street Improvements Project FY 2020-2022* and the *36-Month Street Resurfacing and Improvements for the 2017 Capital Bond Program* contracts for pavement maintenance and road resurfacing activities, totaling \$154,865,243 and \$80,355,051, respectively.

### Texas Materials, Inc.

In September 2018, Texas Materials, Inc., formerly Oldcastle Materials Texas, Inc., entered the *2019 Street Resurfacing and Street Improvements for the 2017 Capital Bond Program* contract, a 24-month agreement to provide road resurfacing services. These projects were bundled into four separate construction contracts for each of the City's service maintenance areas, totaling \$53,686,607.

[Exhibit 4](#), on page 18, details the funding sources and amounts described in the contracts mentioned above.

**Exhibit 4:**

Funding Sources

Contract	Source	Contractor	Activities	Amount
36-Month Maintenance & Street Improvements	1995 General Obligation Bond Program Fund	Heritage Materials, LLC.	Pavement maintenance	\$750,000
	1998 General Obligation Bond Program Fund	Heritage Materials, LLC.	Pavement maintenance	\$384,257
	2003 General Obligation Bond Program Fund	Heritage Materials, LLC.	Pavement maintenance	\$10,653,421
	Capital Projects Reimbursement Fund (Dallas County)	Heritage Materials, LLC.	Pavement maintenance	\$1,318,627
	General Fund	Heritage Materials, LLC.	Pavement maintenance	\$90,014,770
	Resurfacing and Reconstruction Improvements Fund	Heritage Materials, LLC.	Pavement maintenance	\$2,330,726
	Street and Alley Improvement Fund	Heritage Materials, LLC.	Pavement maintenance	\$49,413,441
36-Month Street Resurfacing and Street Improvements Project for 2017 Capital Bond Program	Street and Transportation Fund	Heritage Materials, LLC.	Road Resurfacing	\$80,355,051
2019 Street Resurfacing and Street Improvements for the 2017 Capital Bond Program	Street and Transportation Fund	Texas Materials, Inc.	Road Resurfacing	\$53,686,607
<b>Total</b>				<b>\$288,906,900</b>

**Source:** Department of Public Works executed contracts

Project Details

Additional details for the projects completed under the contracts mentioned above, as of October 28, 2021, can be found in [Exhibit 5](#) on page 19.

**Exhibit 5:**

Completed Project Details as of October 28, 2021

Contract	Contractor	Activities	Total Costs to Date	No. of Projects Completed	Average Days to Complete	Lane Miles Serviced
2019 Street Resurfacing & Street Improvements for the 2017 Capital Bond Program	Texas Materials, Inc.	Road Resurfacing	\$49,811,418	244	1114	202
36-Month Street Resurfacing & Improvements for the 2017 Capital Bond Program	Heritage Materials, LLC	Road Resurfacing	\$24,019,096	114	84	83
36-Month Maintenance and Street Improvements	Heritage Materials, LLC	Pavement maintenance	\$66,827,712	253	82	231
<b>Total/Average</b>			<b>\$140,658,226</b>	<b>611</b>	<b>92</b>	<b>516</b>

**Source:** Department of Public Works completed projects data as of October 28, 2021

City Comparison

As part of its *Five-Year Infrastructure Management Plan for FY 2019 – FY 2023*, the Department of Public Works performed a city comparison of bond program street reconstruction and street maintenance budgets for Fiscal Year 2018-2019, which included the following (see [Exhibit 6](#)):

**Exhibit 6:**

City Comparison Fiscal Year 2018-2019

City	Bond Budget - Street Reconstruction	Street Maintenance Budget	Lane Miles	Population	Street Maintenance Budget per Lane Mile
Houston**	\$174,175,000	\$33,338,578	16,000	2,312,717	2,084
Fort Worth		\$38,375,838	7,518	874,168	5,105
Dallas	\$67,200,000	\$41,200,000	11,770	1,318,000	3,500
Austin		\$75,800,000	9,885	1,834,298	7,668

•• Includes \$1.9B in Enterprise funds.

**Source:** City of Dallas Infrastructure Management Plan for FY 2019 – FY 2023; Appendix A

<sup>4</sup> Auditor excluded projects with a negative value for the number of days to completion (project start date was later than the provided completion date).

Specifically, the study shows a comparison of Texas cities' street maintenance budget per lane mile. The City of Dallas had the second lowest budget for street maintenance per lane mile, with the City of Austin having more than double the street maintenance budget per lane mile compared to the City of Dallas.

## Prior Audits conducted by the Office of the City Auditor

In Fiscal Year 2015, the Office of the City Auditor completed the *Audit of Paving and Maintenance Program/Capital Program Streets and Thoroughfares*, with a follow-up issued in 2017. At that time, auditors concluded that three observations remained a concern:

- Unmet inspection requirements.
- Lack of documentation to demonstrate work was performed.
- Inconsistent or unreliable use of project management systems.

## Methodology

The audit methodology included:

1. Interviewing personnel from the Department of Public Works and other city departments.
2. Reviewing policies and procedures, city directives, requests for proposals, and contract agreements, including:
  - The *2004 Standard Specifications for Public Works Construction*, North Central Texas Council of Governments.
  - The *City of Dallas 2011 Addendum to North Central Texas Council of Governments, Public Works Construction Standards*.
  - *Special Provisions and Proposal for the 36-Month Maintenance and Street Improvements Project FY 2020-FY 2022*.
  - *Special Provisions and Proposal for the 36-Month Street Resurfacing and Street Improvements for the 2017 Capital Bond Program*.
  - *Special Provisions and Proposal for 2019 Street Resurfacing and Street Improvements for the 2017 Capital Bond Program*.
  - *Pavement Cut and Repair Standards Manual*.
  - Dallas City Code, Chapter 43, *Streets and sidewalks*.
3. Performing various analyses, including evaluating the average bid unit prices used by the Texas Department of Transportation for road paving improvements and maintenance/construction projects; as well as benchmarking with the cities of Austin, Fort Worth, and Houston to ascertain how Dallas' budget for street improvements compare.

4. Considering all five internal control components of *Standards for Internal Control in Federal Government*.

This performance audit was conducted 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 upon our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective.

## Major Contributors to the Report

Holly Hart, CPA, CIA – In-Charge Auditor  
Anatoli Douditski, MPA, CIA, ACDA – Engagement Manager  
Yzalida Hiley, MBA

## Appendix B: Management's Response

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### Memorandum



CITY OF DALLAS

**DATE:** February 8, 2022  
**TO:** Mark S. Swann – City Auditor  
**SUBJECT:** Response to Audit of Road Paving Improvements and Maintenance

This letter acknowledges the City Manager's Office received the *Audit of Road Paving Improvements and Maintenance* and submitted responses to the recommendations in consultation with the Department of Public Works.

We appreciate the City Auditor's in-depth review of Public Work's Road Pavement Management Program (Program) and the opportunities they brought to our attention to improve the Program.

Public Works has carefully considered each recommendation and weighed the benefit derived from implementing the auditor's recommendation against the recommendation's opportunity or financial cost. Further, management will accept the risk for recommendations that we have not yet fully vetted and aren't certain we can implement.

In summary, management agrees to implement most of the auditors' high-risk recommendations. However, management will accept the risk for many of the moderate-risk recommendations as most would require additional staff or significant investments in systems that are not currently budgeted.

While we haven't agreed to fully implement several recommendations, we want to emphasize that we found the auditor's recommendations valuable and have committed to improving the Program for over 81 percent of the auditor's recommendations.

Sincerely,

A handwritten signature in black ink, appearing to read 'T. G. Bradna'.

T. G. Bradna  
City Manager

C: Genesis D. Gavino, Chief of Staff  
M. Elizabeth Reich, Chief Financial Officer  
Dr. Robert Perez, Assistant City Manager (Interim)  
Alireza Hatefi, Director (Interim), Department of Public Works

"Our Product is Service"  
Empathy | Ethics | Excellence | Equity



Assessed Risk Rating	Recommendation	Concurrence and Action Plan	Implementation Date	Follow-Up/ Maturity Date
High	We recommend the <b>Director of the Department of Public Works:</b>			
	<b>A.1:</b> Revise and implement department procedures to specify the frequency, timing, and location of quality control testing for all pavement maintenance and road resurfacing projects.	<b>Agree:</b> Public Works Department (PBW) will implement a procedure that will specify the frequency and timing of quality control testing at each milestone and require the consultant to document the location of quality control testing.  Additionally, the procedure will be used to develop special provisions that will be part of future construction documents. While PBW will immediately begin developing the procedure, we cannot commit to implementing the procedure and including the special provisions in our next two-year maintenance contract. However, PBW will commit to implementing the procedure in subsequent contracts.	12/31/2024	6/30/2025
	<b>A.2:</b> Revise and implement department procedures to ensure that quality and timeliness of monitoring activities and their results are documented, reviewed and approved by management, and retained.	<b>Agree:</b> PBW will immediately begin developing department procedures to ensure that monitoring activities are documented, retained, and demonstrate review and approval by management. However, full implementation of the monitoring procedures will be dependent upon implementing recommendation A.1	12/31/2024	6/30/2025

Assessed Risk Rating	Recommendation	Concurrence and Action Plan	Implementation Date	Follow-Up/ Maturity Date
High	<p><b>A.3:</b> Update the progress report form to an electronic format and include a checklist for inspectors to assess construction site aspects in accordance with the <i>City of Dallas 2011 Addendum to North Central Texas Council of Governments, Public Works Construction Standards Sections 107.19.3.3.2, 107.19.3.3.3, 108.2.1 and 404.3.1.1, 404.3.3.1, 504.5.3.2, 702.4.2</i></p>	<p><b>Accept Risk:</b> PBW will improve its processes to include updating the progress report form to an electronic format and will include a checklist requiring inspectors to assess additional aspects of the construction site (e.g., proper signage, etc.), as part of their existing inspection process.</p> <p>However, PBW relies on contractors to assess the quality and appropriateness of materials as samples require testing in labs. Further, to ensure a competitive solicitation process, PBW does not generally specify the equipment a contractor must use in the contract's means and methods section. Therefore, PBW will accept the risk associated with this recommendation.</p>	N/A	N/A
	<p><b>A.4:</b> Ensure inspectors consistently complete all sections of the updated progress report form.</p>	<p><b>Accept Risk:</b> PBW is now exclusively using the QV Sheets system and an electronic inspection form. PBW will enhance the inspection process by including a checklist for inspectors to document the construction site more thoroughly. Further, PBW will attempt to configure the form in QV Sheets to require a response for each question. If that is not feasible, PBW will develop a monitoring plan to periodically review a sample of inspection forms to ensure completeness.</p> <p>However, as PBW will accept the risk associated with recommendation A.3, we will also be accepting the risk with this recommendation.</p>	N/A	N/A

Assessed Risk Rating	Recommendation	Concurrence and Action Plan	Implementation Date	Follow-Up/ Maturity Date
	<b>A.5:</b> Ensure that daily schedules include construction start dates, end dates, the current milestone being worked on, and the treatment type being used.	<b>Agree:</b> PBW uses a daily schedule that tracks projects, contractors, start dates, end dates, and other important information that allows PBW to effectively manage its projects. Further, PBW will update its current daily schedule to include the current milestone being worked on, the treatment type being used, and a reference will be created listing typical milestones for each treatment type.	12/31/2022	6/30/2023
<b>High</b>	We recommend the <b>Director of the Department of Public Works:</b>			
	<b>B.1:</b> Ensure consistent use of <i>Quantity Verification Sheets</i> for all road pavement projects to facilitate review and validation of quantities of materials invoiced.	<b>Agree:</b> PBW used electronic and paper Quantity Verification Sheets during the audit scope. However, PBW has subsequently decided to use electronic Quantity Verification Sheets exclusively.  PBW will update procedures to require the exclusive use of electronic Quantity Verification Sheets and establish a process for monitoring projects to ensure compliance.	12/31/2022	6/30/2023
	<b>B.2:</b> Ensure consistent use of <i>Summary Sheets</i> or another documented, centralized method to verify completeness and accuracy of all quantities validated by the <i>Quantity Verification Sheets</i> .	<b>Agree:</b> PBW used electronic and paper Quantity Verification Sheets during the audit scope. However, PBW has subsequently decided to use electronic Quantity Verification Sheets exclusively. The QV Sheets system is configured to automatically produce a Summary Sheet based on the underlying Quantity Verification Sheets entered into the QV Sheets system.	12/31/2022	6/30/2023
	<b>B.3:</b> Determine the amount overbilling for project PB17V953H and recoup overpayment from the contractor.	<b>Agree:</b> PBW has initiated the process of recouping the overpayment.	9/30/2022	3/31/2023
<b>Moderate</b>	We recommend the <b>Director of the Department of Public Works:</b>			

Assessed Risk Rating	Recommendation	Concurrence and Action Plan	Implementation Date	Follow-Up/ Maturity Date
	<p><b>C.1:</b> Ensure the reasons for project cost overages are documented in the project files.</p>	<p><b>Accept Risk:</b> PBW estimates a program's cost based on the type of treatment and the number of lane miles. Using this method to estimate or budget costs is efficient and provides sufficient accuracy for PBW's collection of projects.</p> <p>However, this method for estimating costs is subject to inaccuracies on an individual project basis. To provide more accurate estimates on an individual project basis would require field observations and measurements on a project-by-project basis. Estimating costs using this method would require an additional five full-time employees and require PBW to move to a 2-year programming cycle from its current 1-year programming cycle.</p> <p>PBW accepts the risk of this recommendation as the current process provides adequate estimated costs for PBW to effectively manage projects as a whole but inherently results in individual projects being above and below the estimated cost.</p>	N/A	N/A
	<p><b>C.2:</b> Monitor and evaluate root causes for cost overages to enhance accuracy and reasonableness of cost estimations for road pavement projects.</p>	<p><b>Accept Risk:</b> PBW's current process is efficient and provides an adequate estimate for the overall program costs. However, using this method inherently results in individual projects costing more or less than the estimated amount. PBW accepts the risk of this recommendation as the current estimation method is the cause of individual projects' actual costs varying from their estimated cost.</p>	N/A	N/A

Assessed Risk Rating	Recommendation	Concurrence and Action Plan	Implementation Date	Follow-Up/ Maturity Date
<b>Moderate</b>	We recommend the <b>Director of the Department of Public Works:</b>			
	<b>D.1:</b> Develop and implement a method to track construction permit status and expiration to ensure compliance with Dallas City Code.	<b>Accept Risk:</b> PBW feels the risk related to this recommendation is low and largely mitigated by PBW's Construction and Right-of-Way (ROW) division. The Construction and ROW division currently enforces permit requirements by ensuring road construction projects have the appropriate right-of-way and traffic control, as applicable, permits.	N/A	N/A
	<b>D.2:</b> Develop specifications for a new or upgraded centralized system to accurately track the status of all pavement maintenance and road resurfacing projects.	<b>Accept Risk:</b> While PBW recognizes the value of implementing a centralized method for tracking project status, we believe this would require a significant system investment or a laborious manual process. PBW believes the cost of implementing a manual process exceeds the benefit.  After consulting with ITS, PBW believes there is a substantial cost and too much uncertainty regarding when a new system will be procured to agree to implement the recommendation and provide a well-founded implementation date.  However, as PBW, in collaboration with ITS, looks to upgrade its systems in the future, it will consider the benefit of a centralized method for tracking projects in developing specifications for new or upgraded systems.	N/A	N/A
	<b>D.3:</b> Ensure that pavement maintenance and road resurfacing project information included in the new or upgraded centralized tracking system is consistent and reliable.	<b>Accept Risk:</b> At this time, PBW will accept the risk associated with its current method for tracking project status. However, as PBW upgrades its systems in the future, it will consider implementing a process to help ensure project information is consistent and reliable.	N/A	N/A

Assessed Risk Rating	Recommendation	Concurrence and Action Plan	Implementation Date	Follow-Up/ Maturity Date
	<b>D.4:</b> Develop a systematic process for storing and retrieving road pavement project documentation.	<b>Agree:</b> PBW will transition to exclusively using electronic documentation. To ensure a systematic process for storing and retrieving documentation, PBW will develop, implement, and train staff on a procedure that specifies where documents by type should be stored moving forward.	12/31/2022	6/30/2022
<b>Moderate</b>	We recommend the <b>Director of the Department of Public Works:</b>			
	<b>E.1:</b> Ensure department personnel follow Administrative Directive 4-05, <i>Contracting Standards and Procedures (Interim)</i> for evaluation of bidders.	<b>Accept Risk:</b> PBW complied with AD 4-05 by requesting and considering the financial capability, and safety and environmental record. PBW does not interpret AD 4-05 to explicitly require the issuing department to verify the information provided by the contractor, including the contractor's experience. However, we recognize that verifying contractor-provided information is a best practice and an effective internal control.  PBW will make a reasonable effort to establish the best practices described above, but until PBW can consult with the Office of Procurement Services and the City Attorney's Office, there remains too much uncertainty to agree to this recommendation at this time.	N/A	N/A
	<b>E.2:</b> Ensure department personnel follow Administrative Directive 4-05, <i>Contracting Standards and Procedures (Interim)</i> for attestation requirements.	<b>Agree:</b> PBW will provide periodic training to applicable staff to help ensure compliance with AD 4-5's attestation requirements, beginning with the next contract requiring attestation.	9/30/2022	9/30/2023