Transparency in Action: Calgary's Gas Permits and Inspection Metrics

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Abstract

This study analyzes Calgary's gas permit and inspection system using the City of Calgary's Gas Permits and Extensions dataset (2023-2024) to evaluate operational efficiency and identify performance trends. Through comprehensive dashboard analysis across three perspectives—executive monitoring, operational oversight, and performance insights—this article examines total inspections focusing on processing times, pass rates, and re-inspection frequencies.

Key findings reveal moderate inspection pass rates, extended average processing times, and notable re-inspection rates. Monthly service level agreement compliance shows room for improvement, with significant processing time variations across permit types. These insights support targeted improvements in Calgary's gas permitting system through enhanced processes, contractor guidance, and strategic resource planning while maintaining public safety standards.

I. Introduction

In a growing city like Calgary, maintaining public safety while ensuring efficient development requires a streamlined permitting process—especially for essential services like gas installations. This article explores insights from the City of Calgary's Gas Permits and Inspections data, highlighting key trends in permit issuance, inspection outcomes, and processing timelines.

With a focus on improving operational efficiency, enhancing inspection workflows, and promoting transparency, the data sheds light on how well the system supports contractors, and safety regulators. By analyzing volume patterns, re-inspection rates, and pass/fail outcomes across communities and time periods, we can better understand where the system excels—and where improvements can drive better service delivery and safer results.

II. Dataset Overview

The Gas Permits and Extensions (2023–2024) dataset is a publicly available record detailing all gas-related building permit applications and inspections within the City of Calgary. It offers valuable insight into the city's permitting activity, from initial application through to inspection outcomes.

Published through the City of Calgary's Open Data Portal, the dataset reflects the city's ongoing commitment to transparency, service improvement, and public safety. It is a key resource for understanding operational efficiency in gas permitting and inspection processes, and for identifying opportunities to enhance service delivery across Calgary's neighborhoods.

III. Objectives

Calgary's Gas Permits and Inspections process aims to deliver faster, more reliable service by focusing on three key goals:

1. Timely and efficient permit processing to reduce delays and keep projects on track.
2. Improved inspection efficiency through better scheduling and fewer re-inspections.
3. Enhanced customer service and transparency by providing open access to data and clear communication.

IV. Methodology

To evaluate the performance of Calgary's gas permitting system, we began by defining key questions focused on processing times, inspection outcomes, and contractor performance. From these, we established relevant KPIs such as average processing time, inspection pass rate, and re-inspection volume.

a. Key Questions

These questions guide the selection of metrics and shape insights into operational performance and service improvement. Key questions include:

- What is the average time between permit application and issuance?
- Is there a link between high application volumes and processing delays?
- Can inspection frequency or sequencing be optimized based on historical approval patterns?

b. KPIs (Key Performance Indicators)

To measure the effectiveness of the gas permitting and inspection process, we identified four key performance indicators:

- **Average Permit Processing Time** to assess overall efficiency in permit approvals.
- **Percentage of Inspections Completed within Target SLA** to evaluate timeliness and compliance with service standards.
- **Inspection Pass Rate** as a measure of inspection quality and readiness.
- **Re-inspection Rate** to identify potential inefficiencies or recurring issues in project execution.

These KPIs help track progress toward operational goals and highlight areas for improvement.

c. Data Model

This data model represents a comprehensive permit inspection system designed to track construction and development permits from application through completion.

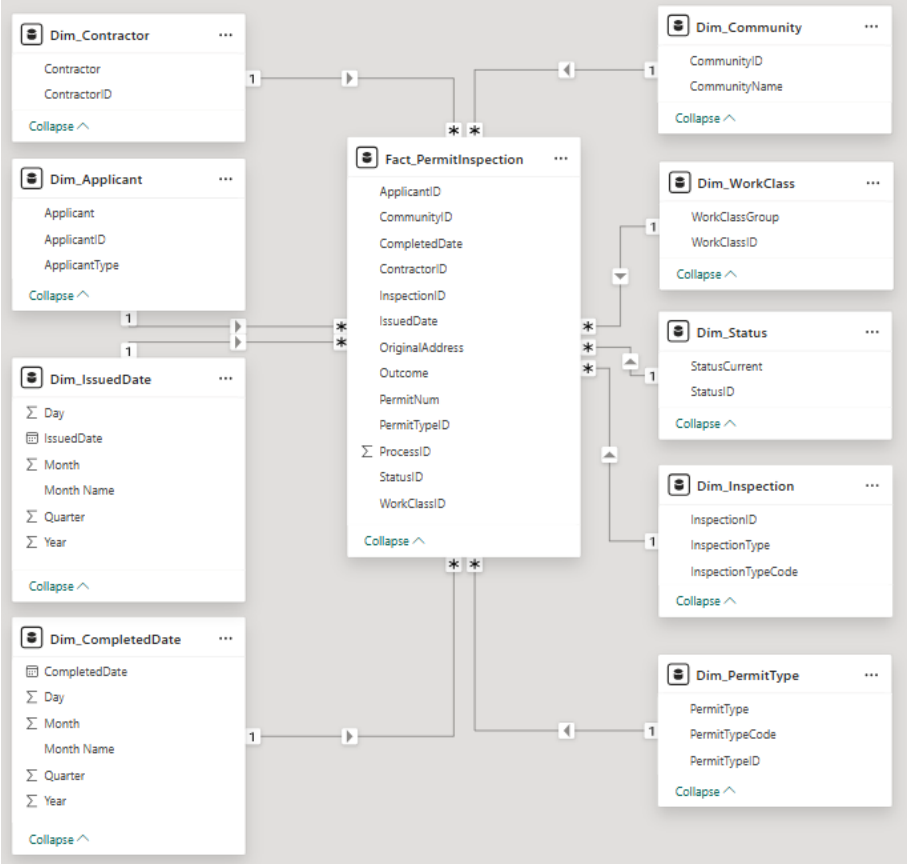

Figure 1: Data Model

The central fact table, Fact_PermitInspection, captures key inspection events and connects to multiple dimension tables that provide contextual information. Dimension tables cover various aspects of the permit process including applicant information, contractor details, community locations, work classifications, inspection types, permit categories, and status tracking. This star schema design supports efficient querying and analysis, allowing stakeholders to track processing times, analyze trends by community or permit type, and generate comprehensive reports on the permit inspection process.

V. Result and Interpretation

This section presents the results and interpretation of the permit inspection data analysis through three key analytical perspectives.

a. Gas Permit Monitoring Dashboard

This section displays the Executive dashboard which provides real-time insights into gas permit inspection operations, delivering a complete overview of key performance metrics and outcomes throughout the permit approval process. This tracks critical indicators including total inspections processed, average processing times, re-inspection rates, and compliance with service level agreements.

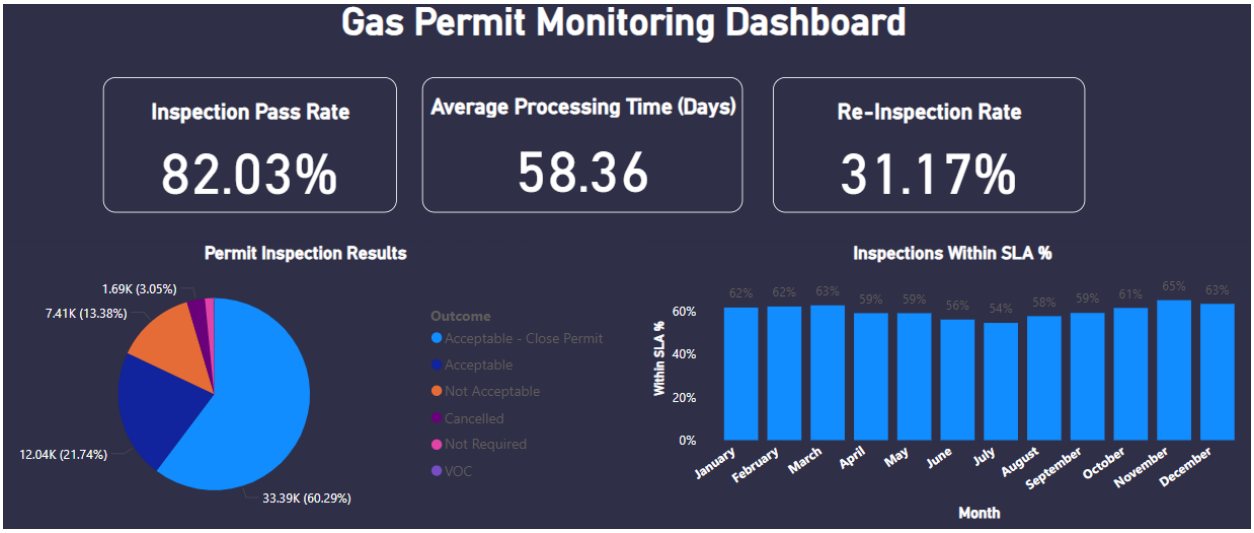

Figure 2: Gas Permit Monitoring Dashboard

1. KPI Cards

The Gas Permit Monitoring Dashboard features three critical KPI cards that provide real-time insights into inspection performance and operational efficiency.

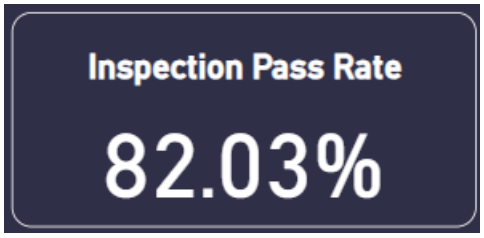

Figure 3: Inspection Pass Rate KPI Card

This card (Figure 3) shows the percentage of gas permit inspections that are marked as "Acceptable - Close Permit". This key performance indicator measures inspection quality and effectiveness, and the need for process improvements or additional applicant guidance.

Figure 4: Average Processing Time (Days) KPI Card

This card (Figure 4) displays the average time of required to process gas permit inspections from start to completion. This metric tracks operational efficiency and helps monitor compliance with service level agreements, enabling identification of bottlenecks and to streamline the permit approval process for improved customer service.

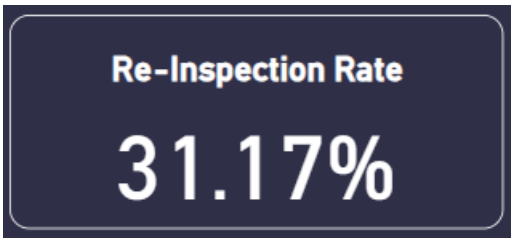

Figure 5: Re-Inspection Rate KPI Card

This card (Figure 5) shows the re-inspection rate, indicating the percentage of permits requiring follow-up inspections after initial assessment. This metric helps identify quality issues, compliance gaps, and opportunities to reduce repeat visits through improved initial inspection processes.

2. Charts

This section provides detailed explanations of all charts and visualizations featured on the Gas Permit Monitoring Dashboard that includes four visual components.

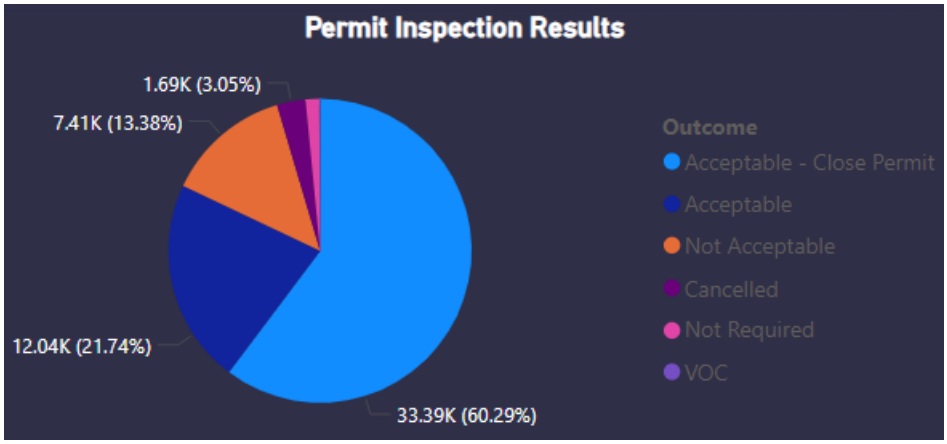

Figure 6: Permit Inspection Result Chart

This pie chart (Figure 6) visualizes the distribution of inspection outcomes across all gas permit inspections. The chart shows the following outcomes:

- **Acceptable - Close Permit**: Inspections that passed and permits can be finalized
- **Acceptable**: Inspections that passed but may require additional documentation or minor follow-up
- **Not Acceptable**: Inspections that failed and require corrections before re-inspection
- **Cancelled**: Inspections that were terminated or withdrawn
- **Not Required**: Inspections determined to be unnecessary upon review
- **VCC**: Violation correction certificates or other regulatory actions

This breakdown helps identify inspection quality trends and areas where applicant support or process improvements may be needed.

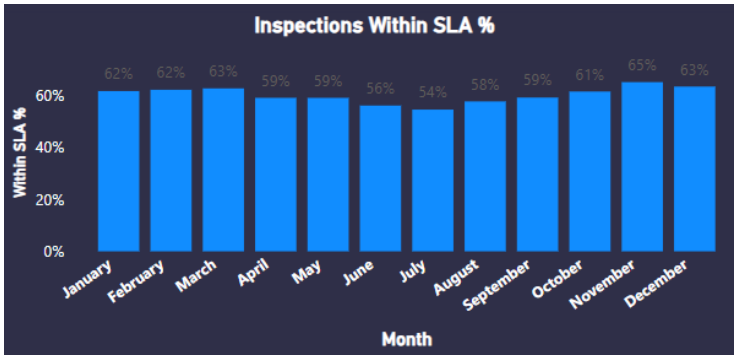

Figure 7: Inspections Within SLA % Chart

This monthly trend chart (Figure 7) tracks the percentage of gas permit inspections completed within the established Service Level Agreement timeframes throughout the year. This metric is crucial for monitoring service delivery standards, and ensuring regulatory compliance while highlighting opportunities to improve processing efficiency and meet customer expectations.

b. Permit and Inspection Operations Overview Dashboard

This section (Figure 8) displays the managerial dashboard which provides a centralized view of gas permit inspection operations, integrating multiple performance metrics and operational data points. The dashboard enables data-driven decision making for resource allocation, process optimization, and continuous improvement initiatives.

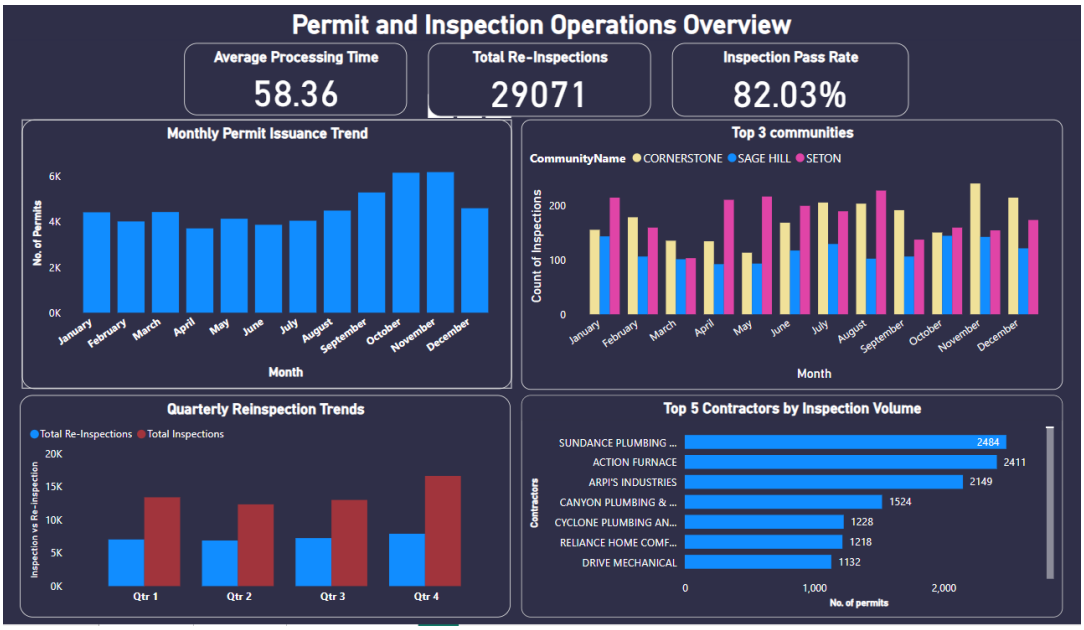

Figure 8: Permit and Inspection Operations Overview Dashboard

1. KPI Cards

This section provides detailed explanations of the KPI cards featured on the Operations Overview Dashboard and includes three primary performance metrics. To maintain a streamlined performance tracking, the Inspection Pass Rate and Average Processing Time KPI cards contain identical data and functionality as previously described in the Gas Permit Monitoring Dashboard (Figure 3 and Figure 4).

Figure 10: Total Re-Inspections KPI Card

This card (Figure 10) displays the total number of re-inspections conducted, representing follow-up inspections required after initial assessments. This metric tracks operational workload from quality issues, compliance gaps, or incomplete initial inspections, helping identify patterns that could reduce repeat visits through improved processes or enhanced initial inspection thoroughness.

2. Charts

This section provides detailed explanations of all charts and visualizations featured on the Operations Overview Dashboard and includes four visual components.

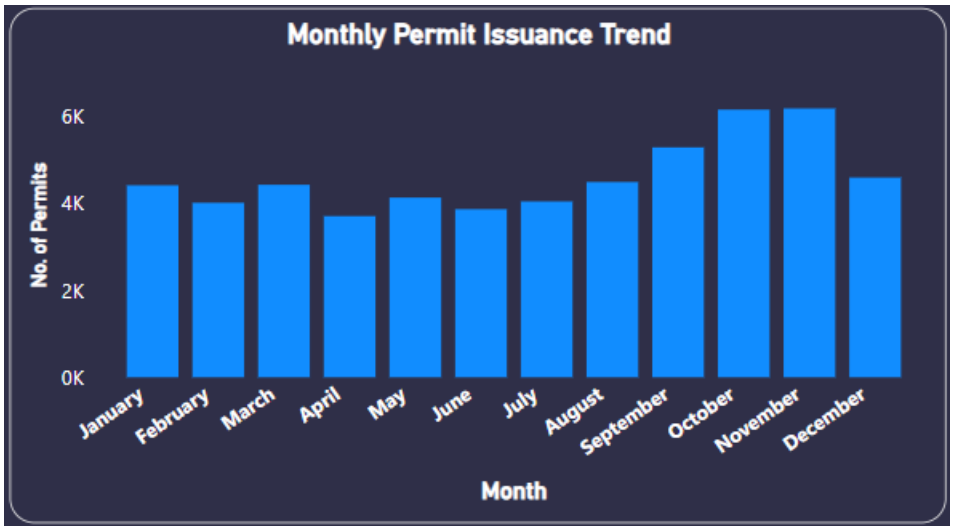

Figure 12: Monthly Permit Issuance Trend Chart

This bar chart (Figure 12) tracks the monthly volume of gas permits issued throughout the year and operational trends in permit processing. This helps identify peak demand periods and workflow capacity requirements. This enables proactive staffing adjustments and process optimization to maintain consistent service delivery during high-volume months.

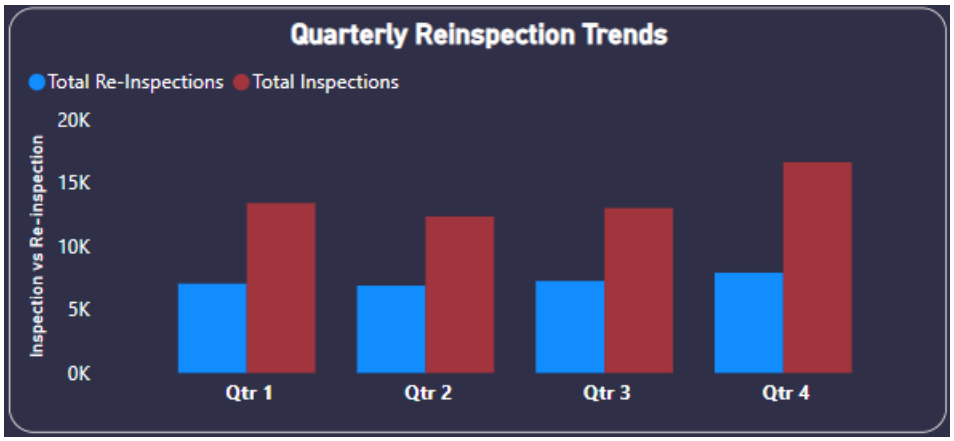

Figure 13: Quarterly Re-inspection Trends Chart

This clustered column chart (Figure 3) displays re-inspection volumes across quarters, tracking trends in follow-up inspection requirements. This helps identify whether re-inspection rates are improving or declining over time and enables management to assess the effectiveness of quality improvement initiatives, and process changes aimed at reducing repeat inspections and enhancing first-time pass rates.

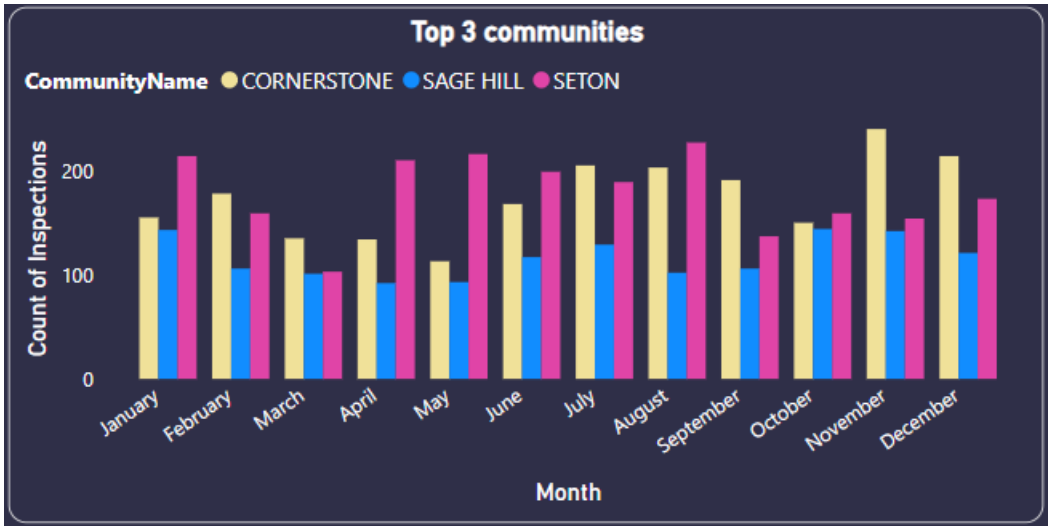

Figure 14: Top 3 Communities Chart

This clustered column chart (Figure 14) identifies the three communities with the highest gas permit inspection activity, providing geographic insights into service demand distribution. This supports resource allocation decisions, staffing adjustments, and targeted community outreach programs to ensure adequate service coverage in high-demand locations.

Figure 15: Top 5 Contractors by Inspection Volume Chart

This horizontal bar chart (Figure 15) identifies the five contractors with the highest number of gas permit inspections. This provides insights into key industry partners and their activity levels which helps track contractor performance patterns and manage relationships with high-volume contractors to ensure inspection quality and streamlined processing.

c. Inspection Trends and Performing Insights Dashboard

This section (Figure 16) displays the Analyst dashboard which provides comprehensive trend analysis and performance insights across gas permit inspection operations. It enables stakeholders to identify emerging trends, forecast future demands, and make strategic decisions.

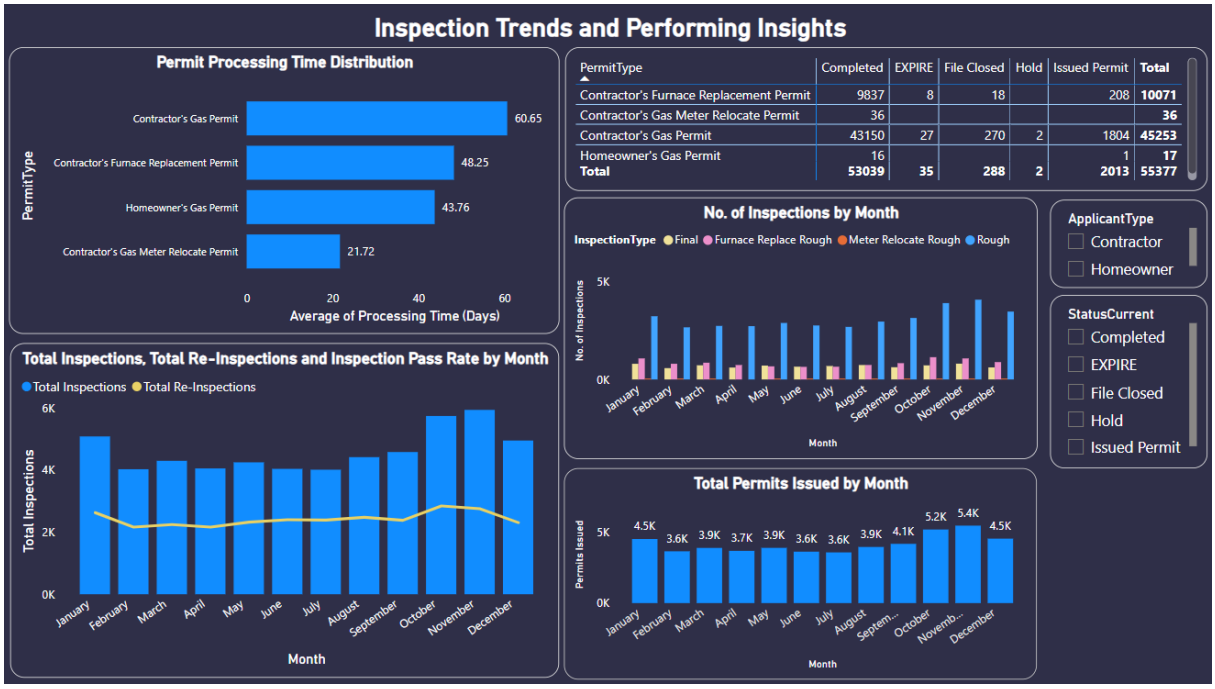

Figure 16: Inspection Trends and Performing Insights Dashboard

1. Charts

This section provides explanations of all charts and visualizations on the Inspection Trends and Performance Insights Dashboard. These analytical components deliver in-depth trend analysis and performance metrics across gas permit inspection operations, displaying patterns, processing distributions, permit type correlations, and outcome matrices.

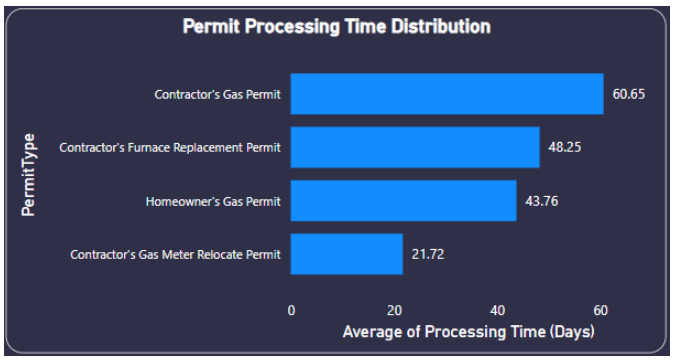

Figure 17: Permit Processing Time Distribution Chart

This horizontal bar chart (Figure 17) displays the average processing times across different gas permit types, showing how long each category takes from application to completion. This breakdown helps identify bottlenecks by permit type and prioritize process improvements for categories with extended processing times.

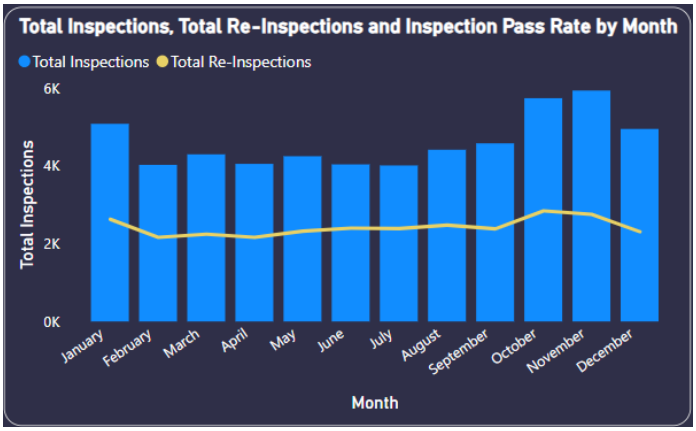

Figure 18: Total Inspections, Total Re-Inspections and Inspections Pass Rate By Month Chart

This line and bar chart (Figure 18) tracks three key performance indicators across monthly periods: total inspection volumes, re-inspection counts, and pass rates. This enables correlation analysis between inspection activity levels and quality outcomes, which identifies resource impacts on performance.

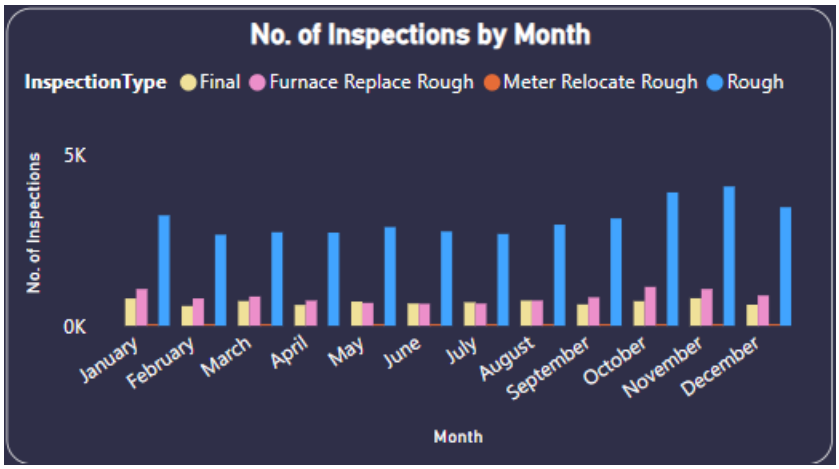

Figure 19: No. of Inspections by Month Chart

This clustered column chart (Figure 19) displays the monthly distribution of gas permit inspections throughout the year, revealing seasonal patterns and workload variations. This helps identify peak inspection periods, plan resource allocation, and anticipate capacity requirements.

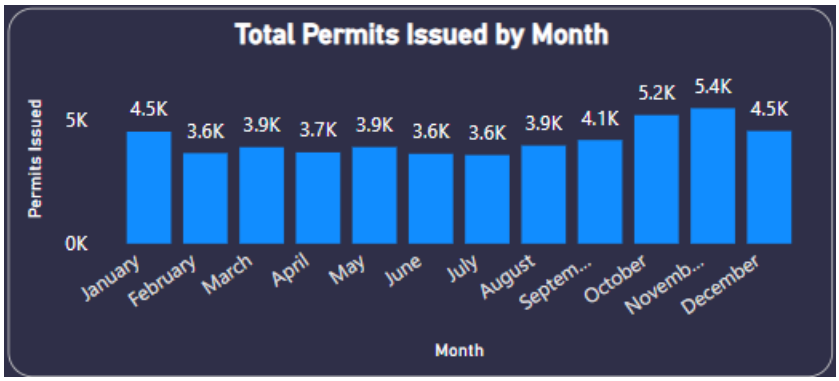

Figure 20: Total Permits Issued by Month Chart

This bar chart (Figure 20) tracks the monthly volume of gas permits issued, showing the completion rate of the permit approval process throughout the year. This reveals seasonal trends in permit finalization, which helps forecast future issuance patterns.

PermitType	Completed	EXPIRE	File Closed	Hold	Issued Permit	**Total**
Contractor's Furnace Replacement Permit	9837	8	18		208	**10071**
Contractor's Gas Meter Relocate Permit	36					**36**
Contractor's Gas Permit	43150	27	270	2	1804	**45253**
Homeowner's Gas Permit	16				1	**17**
Total	**53039**	**35**	**288**	**2**	**2013**	**55377**

Figure 21: Permit Type and Inspection Outcome Matrix

This matrix (Figure 21) displays the relationship between different gas permit types and their corresponding inspection outcomes, showing the distribution of pass/fail rates across permit categories. This helps identify which permit types have higher success rates, pinpoint areas requiring additional process improvements.

VI. Conclusion

This analysis of Calgary's gas permit and inspection system demonstrates the value of data-driven transparency in municipal service improvement. Examining comprehensive inspection data reveals mixed performance indicators highlighting both strengths and improvement opportunities.

This demonstrates Calgary's commitment to transparency through open data initiatives, creating accountability mechanisms benefiting all stakeholders. The insights generated can inform evidence-based policy decisions, resource allocation strategies, and process improvements that enhance service delivery while maintaining safety standards.

Calgary's approach to gas permit transparency serves as a model for other municipalities, demonstrating that open data initiatives can drive meaningful operational improvements while fostering public trust and accountability.