



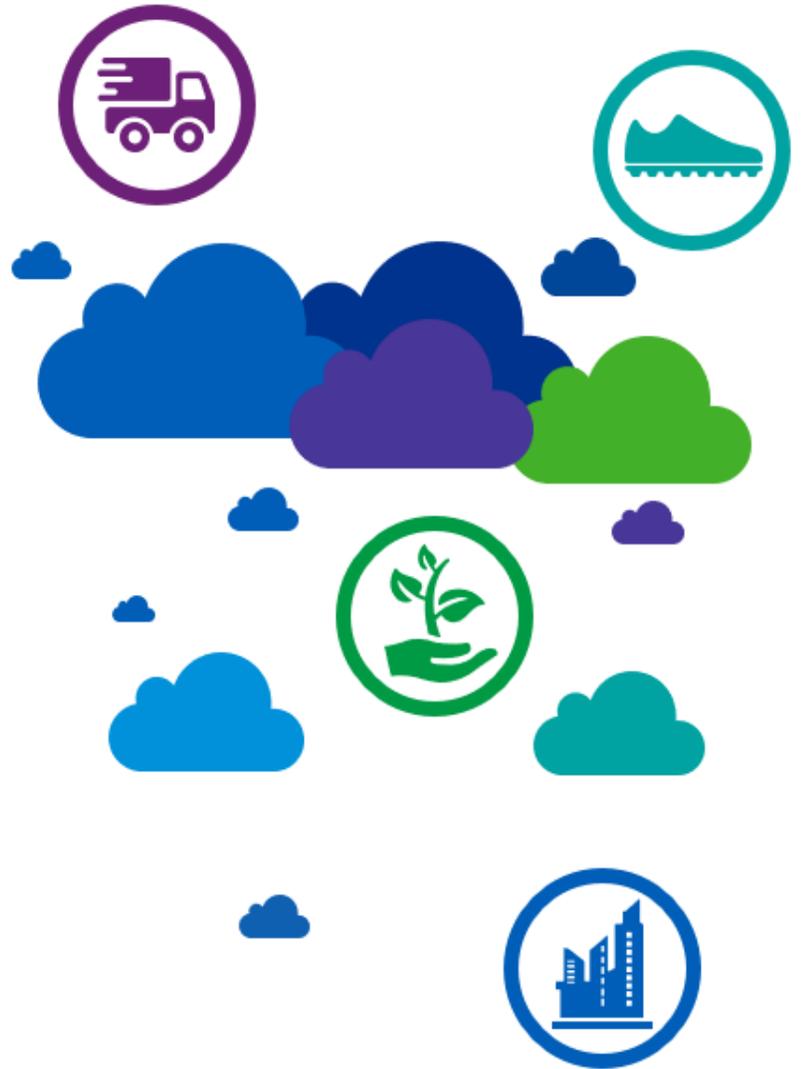
# Reimagine Services

Business Case: Vendor  
Managed Inventory /  
Consignment

CITY OF EDMONTON

CONFIDENTIAL: INTERNAL  
PURPOSES ONLY

MAY, 2021



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# Opportunity Summary

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The City has an opportunity to build on its existing Vendor-Managed Inventory (VMI) capabilities by implementing a combined VMI and Consignment approach for transit and municipal fleet parts. This opportunity would seek to leverage the City's purchasing power with key vendors to optimize parts inventory costs.

***NOTICE TO READER: This opportunity contains commercially sensitive information regarding the City and should not be widely shared.***

VMI is an approach to inventory management where the vendor supports the customer in managing inventory at the customer's location. The inventory can be held by the vendor, the customer, or under a consignment model. The consignment model refers to the financial ownership of inventory, where the customer would not be charged until the parts are consumed.

This opportunity would seek to introduce a combined VMI and Consignment model where the City continues to manage its inventory onsite but works with the vendor to identify a stocking and replenishment strategy that lowers the cost of on-hand inventory and the risk of obsolescence. Parts are not charged to the City until they are consumed.

This opportunity was considered due to the potential to achieve a financial benefit, with minimal disruption to operations or staff. This opportunity would also allow Corporate Procurement & Supply Services to continue developing the supply chain maturity of the City by implementing efficient industry practices.

Two options were considered:

- 1 Use VMI / Consignment for transit fleet's parts inventory.
- 2 Use VMI / Consignment for the parts inventory for both transit and municipal fleet.



## **Recommendation: Vendor Managed and Consignment Parts Inventory**

Based on the analysis completed, **the City should consider expanding its use of VMI approaches to include parts inventory for both transit and municipal fleet.**

It is estimated that this opportunity could deliver potential cumulative savings between \$0.9 million and \$1.6 million over five years, and potential annual savings of approximately \$190 to \$330 thousand by year five. Based on a potential reduction in inventory, the City could anticipate a potential one-time cashflow benefit of between \$2.5 million and \$4 million in addition to the projected savings.

As City staff would continue to manage inventory onsite, there would not be any expected degradation in the availability of or access to parts. It is anticipated that these approaches would result in a stronger vendor relationship, which could lead to additional future benefits, such as discounts or further process improvements.

# Opportunity Background & Context

## OPPORTUNITY AND CURRENT SITUATION

The City currently holds approximately \$12 million in parts inventory across 18 service garages for their municipal and transit fleet (excluding LRT parts). The management of this inventory is critical to fleet uptime, it enables the City's maintenance and repair professionals to have the right parts, in the right place, and at the right time.

Although important to maintaining service levels, holding inventory ties up cash for the City and creates an opportunity cost as that money could be invested elsewhere. There is also a risk associated with inventory as it is susceptible to theft, damage, misplacement and obsolescence, which contributes to the overall carrying cost of inventory. Vendor Managed Inventory (VMI) and Consignment are two inventory management approaches that have the potential to improve cash flow and reduce inventory carrying costs.

VMI is an approach to inventory management where the vendor supports the customer in managing inventory at the customer's location. The inventory can be held by the vendor, the customer, or under a Consignment model. The Consignment model refers to the financial ownership of inventory, where the customer would not be charged until the parts are consumed.

In collaboration with the City's municipal and transit fleet maintenance teams, Corporate Procurement & Supply Services (CPSS) is moving forward with a full VMI model implementation for shop supplies and consumables such as general hardware, safety apparel, and electrical components and accessories. Initial estimates provided by CPSS projected that this initiative could yield approximately \$200,000 in annual cost savings on consumables purchases alone, not inclusive of any savings that result from process improvements.

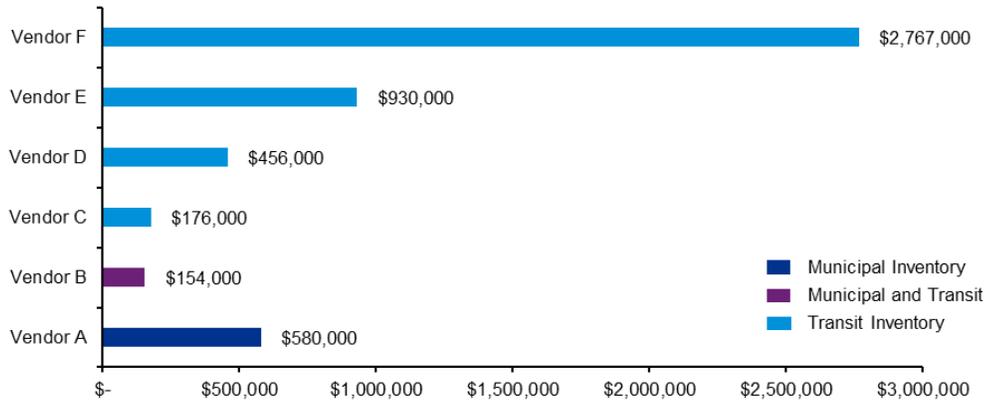
This opportunity explores expansion of these practices through the transit and municipal fleet parts inventory. As identified in Figure 1, this includes the use of a combined VMI and Consignment model where the City continues to manage its inventory onsite, but works with the vendor to identify a stocking and replenishment strategy that lowers the cost of on-hand inventory and the risk of obsolescence. This model would also include a financial arrangement with the vendors where payment for parts would not be made until they are consumed (consignment).

Figure 1: VMI and Consignment Models



In order to identify the potential vendors for this combined VMI and Consignment model, existing transit and municipal fleet vendors were evaluated to identify the highest on-hand inventory values. As highlighted in Figure 2, the greatest opportunity for VMI / Consignment exists in the City's transit fleet, as this is where on-hand inventory values are highest. The higher value of on-hand inventory across vendors is due in part to the more homogenous mix of bus makes and models, when compared to the diverse municipal fleet mix.

**Figure 2: Value and Types of On-hand Inventory by Vendor (January 2021)**



Source: Based on information from the City of Edmonton

The diversity of municipal fleet leads to more dispersed sourcing and lower on-hand inventory. Additionally, some municipal fleet vendors have large distribution centres located in the Edmonton area, and the City is already taking advantage of this proximity to reduce its on-hand inventory for these parts. As Figure 2 illustrates, only two vendors that supply municipal inventory were identified as suitable candidates for VMI / Consignment based on the current value of the parts inventory from each (i.e. Vendor A and B).

## CITY CONTEXT

This business case aligns with the City's strategy and objectives as shown in Table 1.

**Table 1: Alignment to City Strategy**

City Context	Alignment
<b>City of Edmonton Corporate Business Plan</b>	<p>The City's Business Plan supporting objective states, <i>"Manage the Corporation for our Community."</i></p> <p>This objective includes a focus on Financial Management that states, "The City of Edmonton's resilient financial position enables both current and long-term service delivery and growth."<sup>1</sup> This opportunity supports this objective through a focus on efficient asset and financial management.</p>

Source: City of Edmonton Corporate Business Plan.

<sup>1</sup> City of Edmonton. [https://www.edmonton.ca/city\\_government/documents/Corporate\\_Business\\_Plan\\_Placemat\\_Web.pdf](https://www.edmonton.ca/city_government/documents/Corporate_Business_Plan_Placemat_Web.pdf). (Accessed April 2021).

## LEADING AND COMPARATIVE PRACTICES

### VMI IN A MAINTENANCE AND REPAIR ENVIRONMENT

For maintenance professionals, good inventory management means having the right parts in the right place at the right time to support repair and maintenance activities. For supply chain and procurement professionals, good inventory management also means optimizing stock levels, getting the best prices on parts, reliable parts suppliers, and low carrying costs.

A VMI solution is widely recognized as a leading practice that balances the needs of both the maintenance, and supply chain and procurement staff.<sup>2</sup> It achieves this through governance, processes and performance metrics that reduce equipment downtime through integrated planning and forecasting.

Currently, the City's transit and municipal fleet inventory planning uses historical information to drive future demand requirements. Going forward, improved planning would also need to include forecasting of planned maintenance activities in order to drive some of the additional benefits from a VMI model noted above around (e.g., reduced downtime).

### CASE STUDY: VMI / CONSIGNMENT AT A SOUTHERN CALIFORNIA MUNICIPALITY

A transit parts vendor for the City worked with their customer, a municipality in Southern California, to implement a VMI / Consignment approach for 700+ SKUs that support their bus fleet.

The vendor and the municipality worked together to share data and identified the appropriate minimum and maximum inventory levels to support a dedicated inventory approach. This included the municipality sharing their planning data as well as the vendor sharing their supply information. Every three months, these minimum and maximum inventory levels were reviewed to determine if they still met the needs of both the municipality and the vendor. The municipality continued to execute its onsite inventory management to support this approach.

It was anticipated that the municipality would eventually shift to engage the vendor for onsite inventory management. However, they were able to achieve their anticipated goals through the first phase of their transformation, which included reducing cumulative parts costs, improving parts availability, and retaining staff for inventory management. This meant that no impacts to staff were required to achieve benefits.

### CONSIGNMENT

Consignment refers to the financial ownership of inventory, which would reside on-premises at a customer site but would not be charged by the vendor until it is consumed. Consignment can be used on its own without the supplier integration that comes from VMI.

Interviews with key vendors for the City raised concerns around using this model without some integration using a VMI model. For example, the City's parts availability could be impacted as vendors could withhold stock to reduce their risk of obsolescence.

Vendors suggested that in order to mitigate key risks and still achieve inventory cost savings, a Consignment model could be paired with elements of VMI that focus on integrated planning, while still allowing the City to manage their inventory onsite.

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<sup>2</sup> KPMG. Outsourcing the MRO Supply Chain. <https://advisory.kpmg.us/articles/2020/outsourcing-mro-supply-chain.html>. (Accessed April 2021).

## ENVIRONMENTAL CONSIDERATIONS

COVID-19 has put pressure on governments across the globe to review how they could adapt to and recover from the economic shock of an ongoing pandemic. Edmonton is no exception to this as it faces its own challenges for an economic recovery. These challenges have been intensified by the drop in oil prices, as the oil and gas sector serves as a critical sector for Edmonton.<sup>3</sup> Financial and revenue pressures for the City have intensified, even as vendors and supply chains have had to adapt.

Stronger supplier integration through a VMI / Consignment model, along with more integrated planning by the City, would be expected to improve forecast accuracy and could result in a more efficient shipment schedule for parts, thus reducing the environmental impact of transportation. There would also be a potential to reduce the waste caused by obsolescence.

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<sup>3</sup> City of Edmonton. [https://www.edmonton.ca/business\\_economy/documents/Q4\\_2020\\_Economic\\_Update.pdf](https://www.edmonton.ca/business_economy/documents/Q4_2020_Economic_Update.pdf). (Accessed April 2021).

# Options

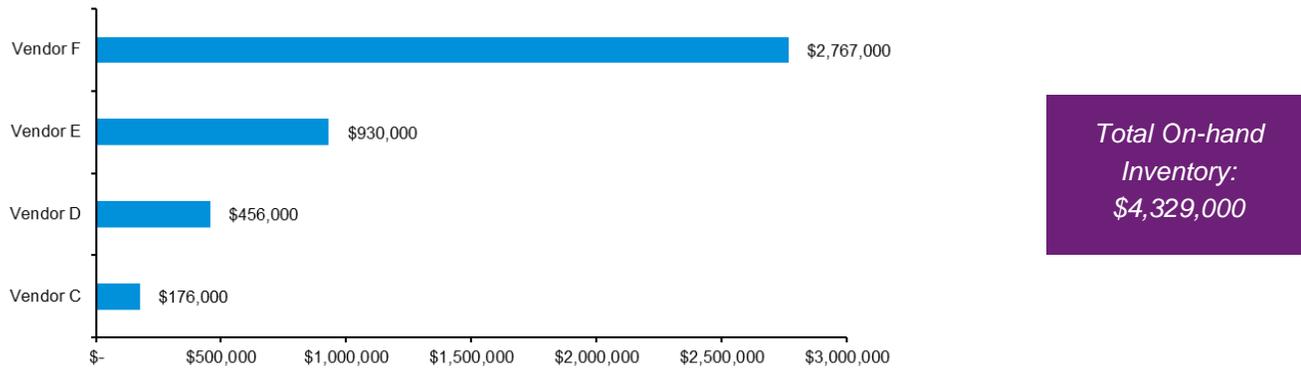
Using the City's current value of on-hand inventory, potential vendors for a VMI / Consignment model were identified for transit and municipal fleet parts. For both options, it is important to note that VMI / Consignment relationships would have to be pursued with each vendor individually.

Two options were considered for this opportunity. The main differentiators of the options are the value of inventory and volume of vendors included. Vendors have been anonymized for the purposes of reporting.

## OPTION 1: USE VMI / CONSIGNMENT FOR TRANSIT FLEET'S PARTS INVENTORY

The City has the opportunity to only pursue VMI / Consignment with vendors that supply parts for transit. These vendors and their on-hand inventory values are identified in Figure 3.

Figure 3: Value of On-hand Inventory for Transit Vendors (January 2021)

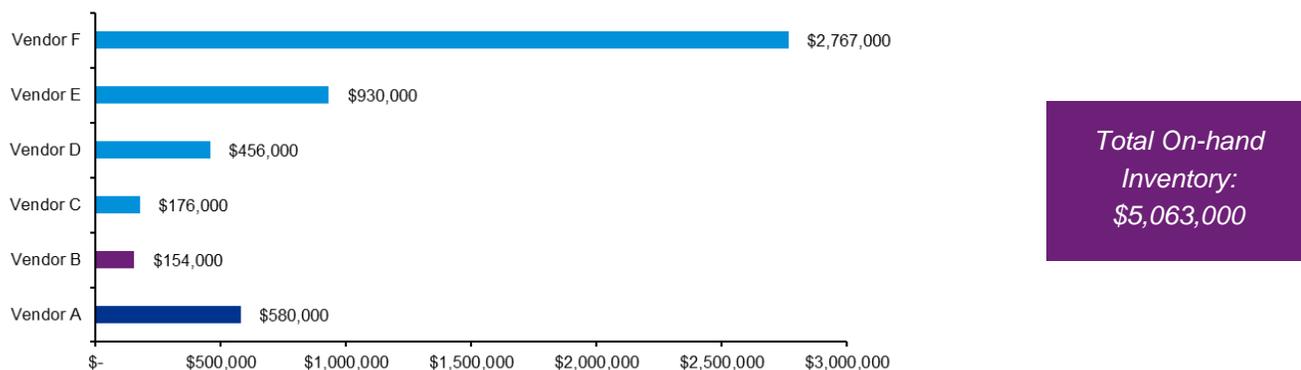


Source: Based on information from the City

## OPTION 2: USE VMI / CONSIGNMENT FOR TRANSIT AND MUNICIPAL FLEET'S PARTS INVENTORY

The City has the opportunity to pursue VMI / Consignment with vendors that supply parts for both transit and municipal fleet. These vendors and their on-hand inventory values are identified in Figure 4.

Figure 4: Value of On-hand Inventory for Transit and Municipal Vendors



Source: Based on information from the City

# Impact Assessment

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## **SERVICE IMPACT**

Through implementation of the VMI / Consignment model, there would not be any anticipated degradation in parts availability or access. City staff would continue with their onsite warehousing and inventory management practices, meaning internal customers should experience the same process to access parts.

To improve future parts availability through this model, forecasting that includes demand signals from planned maintenance would be required from Fleet and Facility Services (FFS). Currently, FFS forecasts demand based on historical consumption. By integrating the demand signals from FFS and the visibility into availability from the vendor, CPSS would be able to support the reduction in downtime due to parts stockouts.

## **DELIVERY IMPACT**

This opportunity would not be expected to materially affect the City's ability to operate effectively. Although a full VMI solution would include more onsite involvement in the inventory management process from the vendor, the partial VMI / Consignment model identified through this opportunity would still require the City to execute onsite inventory management activities. Existing City parts technicians would still be needed to support the repair and maintenance process and warehouse technicians would still execute inventory management activities such as receiving and cycle counting.

There would be no expected incremental technology investment required to support this opportunity. Information regarding current stocking levels and replenishment requirements would be communicated through the City's existing technology systems. Existing systems and accounts payable processes also provide the ability to execute automated purchase orders.

## **VIABILITY**

This opportunity would likely be viable as the City has already shown an appetite and capability for implementing collaborative supplier arrangements to support the management of its parts inventory. This opportunity would also not require any changes existing parts and warehouse technician roles, minimizing disruption to current operations.

Two vendors have currently indicated an interest in exploring the VMI / Consignment model with the City. The vendors being considered also have experience implementing these approaches with other municipalities. The CPSS team also supported exploring additional VMI / Consignment opportunities that would be more robust and go beyond consumable shop supplies.

Capabilities currently exist within the City to support a data exchange / automatic purchase order approach. Although this would require additional planning between the City and the vendor, it would be possible to establish this VMI / Consignment model using current transactional methods.

## **GBA+ IMPACTS AND MITIGATIONS**

This idea is not expected to increase or reduce barriers to the City's more vulnerable populations. See Appendix A: GBA+ Assessment for further details.

## FINANCIAL IMPACTS

This opportunity would be estimated to achieve a potential financial benefit of between \$0.9 million and \$1.6 million within five years for the City. The projected savings are summarized in Table 2, using “high” and “low” scenarios to demonstrate the impacts of different vendors pursuing a VMI / Consignment model. See Appendix B: Financial Projections for further information on financial projections, a notice to reader, and significant assumptions.

**Table 2: Five-Year Financial Summary (in thousands)**

Option	Scenario	2022	2023	2024	2025	2026	Estimated Potential Five-Year Total
Option 1 – VMI / Consignment for transit fleet’s parts inventory	High	\$243	\$248	\$253	\$259	\$266	\$1,269
	Low	\$175	\$178	\$182	\$186	\$191	\$911
Option 2 – VMI / Consignment for transit and municipal fleet’s parts inventory	High	\$302	\$307	\$314	\$322	\$330	\$1,574
	Low	\$213	\$218	\$222	\$228	\$233	\$1,114

Source: Based on data and analysis provided by the City and assumptions outlined in Appendix B.

Note: Figures rounded to nearest thousand.

Over and above the savings identified, this opportunity would also be expected to achieve a one-time cash flow benefit through the potential reduction in on-hand inventory. The projected benefit is highlighted in Table 3.

**Table 3: Estimated potential one-time cash flow benefit (in thousands)**

Option	Scenario	Estimated Potential Inventory Value
Option 1 – VMI / Consignment for transit fleet’s parts inventory	High	\$3,327
	Low	\$2,490
Option 2 – VMI / Consignment for transit and municipal fleet’s parts inventory	High	\$3,988
	Low	\$2,629

Source: Based on data and analysis provided by the City and assumptions outlined in Appendix B.

## RISKS

Some key risks and mitigations are described in Table 4. Additional details on risks can be found in Appendix C: Risk Analysis.

Table 4: Key Risks

Potential Risk	Potential Mitigation
<p><b>Forecasting Data</b></p> <p>There is a risk that the City would not have the right forecasting data available to meet the needs of a VMI / Consignment model. Currently, forecasts are developed from historical usage.</p> <p>To engage in this model, vendors may require forecasting based on planned maintenance demands to reduce their risk of obsolescence.</p>	<p>The probability of this risk could be reduced through the implementation of a parts forecasting model that integrates planned maintenance. Conversations with vendors would need to include both CPSS and FFS to ensure fleet maintenance has the appropriate input.</p>
<p><b>Vendor Interest</b></p> <p>There is a risk that vendors may not want to pursue a VMI / Consignment relationship with the City.</p>	<p>The probability of this risk occurring may be reduced by identifying opportunities to consolidate vendors to increase the City's purchasing power. The impact of this risk could also be reduced by the City building their own capabilities with VMI / Consignment models through selecting one vendor for an implementation and then phasing in others.</p> <p>Notably, vendors that were interviewed suggested they had an interest in this model.</p>

Source: Based on information provided by the City.

# Opportunity Assessment

## OVERALL ASSESSMENT OF OPPORTUNITY AGAINST CRITERIA

The opportunity assessment of both options against the criteria identified in this business case is summarized in Table 5, where green, grey and red represent a positive, neutral and negative impact respectively.

Table 5: Opportunity Assessment

Options	Impact						Implementation			
	Service	Delivery	GBA+	Financial	Risk	Estimated Potential Five-Year Benefit (Thousands)	Time	Cost	Risk	Estimated Potential Implementation Cost (Thousands)
1. Use VMI / Consignment for transit fleet's parts inventory	●	●	●	●	●	\$900 to \$1,300	●	●	●	\$0
2. Use VMI / Consignment for transit and municipal fleet's parts inventory	●	●	●	●	●	\$1,100 to \$1,600	●	●	●	\$0

Source: Prepared by KPMG

Based on a potential reduction in inventory, the City could also anticipate a one-time cashflow benefit of between \$2.5 million and \$4 million.

## CONCLUSION AND RECOMMENDATION

Based on analysis of the potential options, the City should consider implementing Option 2: use VMI / Consignment for transit and municipal fleet's parts inventory.

### Recommended Action 1

**The City should explore implementing a VMI / Consignment model with vendors who have expressed interest.**

Vendor B and Vendor F have expressed interested in a VMI / Consignment relationship and have demonstrated experience in implementation of these models with other municipalities. By starting with these vendors, the City has an opportunity to continue building upon their existing vendor management capabilities and processes.

## Recommended Action 2

**The City should consider putting controls in place to monitor the success of the VMI / Consignment relationship.**

This recommendation would support both continuous improvement of the VMI / Consignment approach as well as understanding when the relationship achieves its targeted outcomes. This would help identify when additional vendors could be onboarded and allow the City to integrate lessons learned into future relationships.

## Recommended Action 3

**Over time, the City could continue expanding the implementation of VMI / Consignment with targeted vendors across their transit and municipal fleet inventories.**

The City could also establish criteria for identifying future vendors for participation in a VMI / Consignment relationship.

# Appendix A: GBA+ Assessment

## EVALUATION SUMMARY

### What is the overall GBA+ assessment?

This idea does not appear to increase or reduce barriers to more vulnerable populations.

### What are the main groups that could be affected (including those with no vulnerabilities), and what impacts are noted?

The main groups involved with this idea are CPSS and the transit and municipal fleet staff that rely on parts availability to execute repair and maintenance activities. The change associated with this opportunity would be largely accounting based and therefore would not be expected to impact these groups.

### What do we know about the people who would be affected by this change?

-2. Very little known about them or their characteristics	-1. Some general idea of numbers or types of people affected	<b>0. Good idea of overall numbers and some other aspects (e.g., time/nature of needs)</b>	+1. Good information on the numbers of people affected and some key characteristics	+2. Good information on numbers, demographics groups, and contact lists (e.g., email / phone lists)
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### What impact would there be from this change on the staff members of the City or other agencies who may be from these groups?

This idea is expected to have little to no impact on staff, as it focuses primarily on the transfer of inventory ownership.

### What equity measures could we use or implement to improve or positively mitigate impact for one or more of the groups identified?

As this idea focuses on achieving an accounting benefit, there are no opportunities to implement a shift for this idea.

### How confident we are in the information we are basing our decisions on? What could we do to check or confirm our assumptions?

The CPSS team already has experience with VMI and based on the outcomes from these efforts as well as confirmation through leading practice reviews, there is a high level of confidence in the information available.

## IMPACT OF THIS CHANGE ON PEOPLE BY KEY IDENTIFIED VULNERABILITIES

Consider how you would expect this change to affect people with various types of characteristics that may give rise to vulnerabilities:

Personal Characteristics	-2 Could create new barriers	-1 Could exacerbate existing barriers	0 Limited effect or impact unknown	+1 Could reduce existing barriers	+2 Substantially improved access
People who are not physically strong or confident in their movements			0		
People with vulnerable people with them			0		
People who currently have very limited or no income			0		
People who may experience fear or distress due to threats or violence			0		
People with additional language or communication needs			0		
People who may find mainstream activities unwelcoming or not appropriate for their needs			0		
<b>Total Score</b>	<b>0 Limited effect or impact unknown</b>				

# Appendix B: Financial Projections

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## NOTICE

The financial projections contained in this document provide future-oriented financial information. These projections are based on a set of circumstances and the City's assumptions as of April 2021. Significant assumptions are included in the document and must be read to interpret the information presented. Should events differ from the stated assumptions, actual results will differ from the financial projections and such differences may be material.

The financial information and assumptions contained herein have been prepared to assist readers in deciding whether or not to proceed with their own in-depth investigation and evaluation of the options presented, and does not purport to contain all the information readers may require. Readers should conduct their own investigation and analysis of the options.

KPMG accepts no responsibility or liability for loss or damages to any party as a result of decisions based on the information presented. Parties using this information assume all responsibility for any decisions made based on the information.

## SIGNIFICANT ASSUMPTIONS

### COMMON ASSUMPTIONS

1. The cost of capital is 2% and is based on an assumed discount rate based on the City's cost of capital, estimated at 1.976% based on the 10-year borrowing rate.<sup>4</sup>
2. Carrying costs include the cost of capital. As per assumption one, the cost of capital is 2%.
3. The one-time cashflow benefit is calculated based on the current on hand inventory balances, assuming the City would continue to own 10% of the on-hand inventory associated with each Option.
4. The savings associated with the overall working capital improvements are assumed to be a one-time benefit.
5. Inventory obsolescence is estimated at 1% for the primary scenarios. Although individual vendor obsolescence may vary, this value will be used for calculations.
6. As actual inventory obsolescence may vary across vendors, a sensitivity analysis for each option and scenario are included that reflect the potential of a 0.5% and 2% obsolescence.
7. On-hand inventory is shown at a point in time of January 2021, it is assumed that inventory values would remain consistent over the five-year period.
8. Additional costs incurred by the vendor to execute a VMI / Consignment model would not be passed on to the City in terms of a price increase.
9. It is anticipated that the City would not receive any benefit from a reduction in inventory shrinkage as they would be charged by the vendor for any missing inventory following cycle counts.

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<sup>4</sup> Government of Alberta. (April, 2021) <https://acfa.gov.ab.ca/loan-form-script/rates.html>

10. Vendors B and Vendor F have expressed interest in establishing a VMI / Consignment approach with the City.
11. No additional investment or reduction in headcount is required from the City to implement or manage VMI / Consignment approaches.
12. Vendors were selected by the City based on an evaluation of their total on-hand inventory and consideration of the viability of the current or future relationship for a VMI / approach.
13. For projected savings, the analysis assumes that the City would continue to own 10% of the on-hand inventory associated with each Option.
14. Inflation is adjusted for in each year at the following rates:

	2022	2023	2024	2025	2026
<b>Average Inflation Rate (%)</b>	1.7%	1.9%	2.1%	2.5%	2.5%

### **OPTION 1 - USE FOR ETS TRANSIT FLEET'S PARTS INVENTORY ONLY**

15. High Scenario – Assumes proceeding with Vendor E and Vendor F, as the two vendors with highest on-hand inventory.
16. High Scenario – On-hand inventory for Vendor E and Vendor F is estimated at \$3,697,000 in 2021. Annual inventory spend for Vendor E and F is estimated at \$8,856,000 in 2020 and adjusted for inflation until 2026.
17. Low Scenario – Assumes proceeding with only Vendor F as they have expressed interest in a VMI / Consignment approach.
18. Low Scenario – On-hand inventory for Vendor F is estimated at \$2,767,000 in 2021. Annual inventory spend for Vendor F is estimated at \$6,610,000 in 2020 and adjusted for inflation until 2026.

### **OPTION 2 - USE FOR ETS TRANSIT AND MUNICIPAL FLEET'S PARTS INVENTORY ONLY**

19. High Scenario – Assumed proceeding with Vendor A, Vendor B, Vendor E, and Vendor F as the highest on-hand inventory vendors for both transit and municipal fleet parts.
20. High Scenario – On-hand inventory Vendor A, Vendor B, Vendor E, and Vendor F is estimated at \$4,431,000 in 2021. Annual inventory spend for Vendor A, Vendor B, Vendor E, and Vendor F is estimated at \$10,980,000 in 2020 and adjusted for inflation until 2026.
21. Low Scenario – Assumes proceeding with only Vendor B and Vendor F as they have expressed interest in a VMI / Consignment approach.
22. Low Scenario – On-hand inventory for Vendor B and Vendor F is estimated at \$2,921,000 in 2021. Annual inventory spend for Vendor B and Vendor F is estimated at \$7,774,000 and adjusted for inflation until 2026.

## FIVE-YEAR PROJECTIONS

Two scenarios are presented for each option in order to demonstrate the range of potential financial benefits based on the number of vendors that would engage in a VMI / Consignment model. The “low” scenarios include only the vendors that have currently expressed interest in the model while the “high” scenarios include those vendors as well as additional potential vendors. For each high and low scenario under each option, a sensitivity analysis is also included that considers potential differences in the inventory obsolescence rate.

A “high” scenario assumes and a “low” scenario.

### OPTION 1

Use VMI / Consignment for transit fleet’s parts inventory for identified vendors.

**Table 6: Option 1 – Potential High Scenario (in thousands)**

Total Estimated Potential Savings	2022	2023	2024	2025	2026	Estimated Potential Five-Year Total
Carrying Cost	\$162	\$165	\$169	\$173	\$177	\$846
Obsolescence	\$81	\$83	\$84	\$86	\$89	\$423
Estimated Potential Total	\$243	\$248	\$253	\$259	\$266	\$1,269

Source: Based on data and analysis provided by the City and assumptions outlined in Appendix B.  
Note: Figures rounded to nearest thousand.

**Table 7: Option 1 – Potential High Scenario – Inventory Obsolescence Sensitivity Analysis (in thousands)**

Total Estimated Potential Savings	2022	2023	2024	2025	2026	Estimated Potential Five-Year Total
Savings with 2% Obsolescence	\$324	\$330	\$337	\$346	\$354	\$1,692
Savings with 1% Obsolescence	\$243	\$248	\$253	\$259	\$266	\$1,269
Savings with 0.5% Obsolescence	\$203	\$206	\$211	\$216	\$222	\$1,058

Source: Based on data and analysis provided by the City and assumptions outlined in Appendix B.  
Note: Figures rounded to nearest thousand.

**Table 8: Option 1 – Potential Low Scenario (in thousands)**

<b>Estimated Potential Savings</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>Estimated Potential Five-Year Total</b>
<b>Carrying Cost</b>	\$116	\$119	\$121	\$124	\$127	<b>\$608</b>
<b>Obsolescence</b>	\$58	\$59	\$61	\$62	\$64	<b>\$304</b>
<b>Estimated Potential Total</b>	<b>\$175</b>	<b>\$178</b>	<b>\$182</b>	<b>\$186</b>	<b>\$191</b>	<b>\$911</b>

*Source: Based on data and analysis provided by the City and assumptions outlined in Appendix B.  
Note: Figures rounded to nearest thousand.*

**Table 9: Option 1 – Potential Low Scenario – Inventory Obsolescence Sensitivity Analysis (in thousands)**

<b>Estimated Potential Savings</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>Estimated Potential Five-Year Total</b>
<b>Savings with 2% Obsolescence</b>	\$233	\$237	\$242	\$248	\$255	<b>\$1,215</b>
<b>Savings with 1% Obsolescence</b>	\$175	\$178	\$182	\$186	\$191	<b>\$911</b>
<b>Savings with 0.5% Obsolescence</b>	\$146	\$148	\$151	\$155	\$159	<b>\$760</b>

*Source: Based on data and analysis provided by the City and assumptions outlined in Appendix B.  
Note: Figures rounded to nearest thousand.*

This opportunity would also be expected to achieve a one-time cash flow benefit through the potential reduction in on-hand inventory. This benefit is highlighted in Table 10.

**Table 10: Option 1 – Estimated Potential One-time Cash Flow Benefit (in thousands)**

<b>Option</b>	<b>Scenario</b>	<b>Estimated Potential Inventory Value</b>
<b>Option 1 – VMI / Consignment for transit fleet’s parts inventory</b>	High	\$3,327
	Low	\$2,490

*Source: Based on data and analysis provided by the City and assumptions outlined in Appendix B.*

## OPTION 2

Use VMI / Consignment for transit and municipal fleet's parts inventory for identified vendors

Table 11: Option 2 – Potential High Scenario (in thousands)

Estimated Potential Savings	2022	2023	2024	2025	2026	Estimated Potential Five-Year Total
Carrying Cost	\$201	\$205	\$209	\$214	\$220	\$1,049
Obsolescence	\$101	\$102	\$105	\$107	\$110	\$525
<b>Estimated Potential Total</b>	<b>\$302</b>	<b>\$307</b>	<b>\$314</b>	<b>\$322</b>	<b>\$330</b>	<b>\$1,574</b>

Source: Based on data and analysis provided by the City and assumptions outlined in Appendix B.  
Note: Figures rounded to nearest thousand.

Table 12: Option 2 – Potential High Scenario – Inventory Obsolescence Sensitivity Analysis (in thousands)

Estimated Potential Savings	2022	2023	2024	2025	2026	Estimated Potential Five-Year Total
Savings with 2% Obsolescence	\$402	\$410	\$418	\$429	\$439	\$2,098
Savings with 1% Obsolescence	\$302	\$307	\$314	\$322	\$330	\$1,574
Savings with 0.5% Obsolescence	\$251	\$256	\$261	\$268	\$275	\$1,311

Source: Based on data and analysis provided by the City and assumptions outlined in Appendix B.  
Note: Figures rounded to nearest thousand.

Table 13: Option 2 – Potential Low Scenario (in thousands)

Estimated Potential Savings	2022	2023	2024	2025	2026	Estimated Potential Five-Year Total
Carrying Cost	\$142	\$145	\$148	\$152	\$156	\$743
Obsolescence	\$71	\$73	\$74	\$76	\$78	\$371
<b>Total</b>	<b>\$213</b>	<b>\$218</b>	<b>\$222</b>	<b>\$228</b>	<b>\$233</b>	<b>\$1,114</b>

Source: Based on data and analysis provided by the City and assumptions outlined in Appendix B.  
Note: Figures rounded to nearest thousand.

**Table 14: Option 2 – Potential Low Scenario – Inventory Obsolescence Sensitivity Analysis (in thousands)**

<b>Estimated Potential Savings</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>Estimated Potential Five-Year Total</b>
<b>Savings with 2% Obsolescence</b>	\$285	\$290	\$296	\$304	\$311	<b>\$1,485</b>
<b>Savings with 1% Obsolescence</b>	\$213	\$218	\$222	\$228	\$233	<b>\$1,114</b>
<b>Savings with 0.5% Obsolescence</b>	\$178	\$181	\$185	\$190	\$194	<b>\$928</b>

*Source: Based on data and analysis provided by the City and assumptions outlined in Appendix B.  
 Note: Figures rounded to nearest thousand.*

This opportunity would also be expected to achieve a one-time cash flow benefit through the potential reduction in on-hand inventory. This benefit is highlighted in Table 15.

**Table 15: Option 2 – Estimated Potential One-time Cash Flow Benefit (in thousands)**

<b>Option</b>	<b>Scenario</b>	<b>Estimated Potential Inventory Value</b>
<b>Option 2 – VMI / Consignment for transit and municipal fleet’s parts inventory</b>	High	\$3,988
	Low	\$2,629

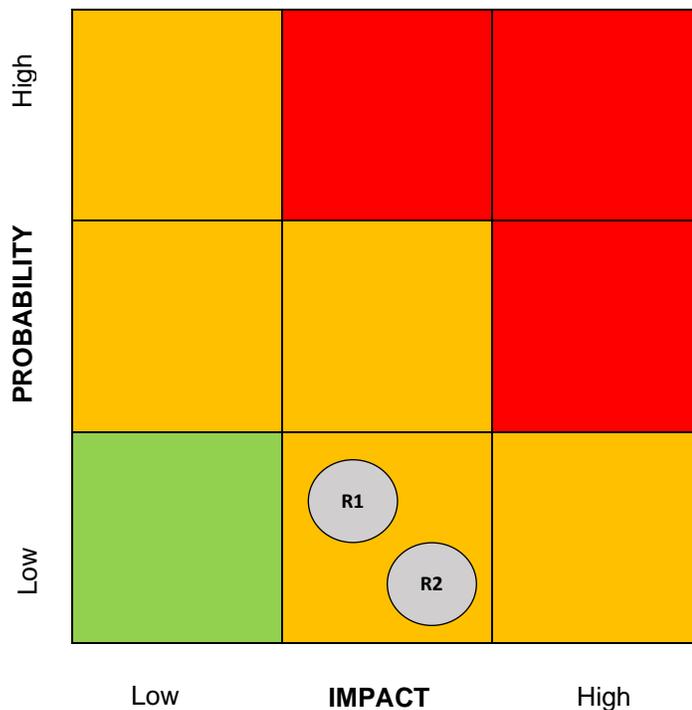
*Source: Based on data and analysis provided by the City and assumptions outlined in Appendix B.*

# Appendix C: Risk Analysis

## RISK ASSESSMENT

There is a medium level of financial and supplier / market risk associated with this opportunity.

Figure 5: Risk Matrix



## RISK ASSESSMENT AND MITIGATIONS

The risks and mitigation strategies identified for this opportunity are outlined in Table 16 below.

Table 16: Risk Register

Risk	Relevant Categories	Highest Rating	Mitigation	Residual Risk
<b>Vendor Interest</b> There is a risk that vendors may not want to pursue a VMI / Consignment relationship with the City.	Supplier / Market Financial	<b>Financial</b> Impact: Medium Probability: Low Overall: Medium	The probability of this risk occurring may be reduced by identifying opportunities to consolidate vendors to increase the City's purchasing power. The impact of this risk could also be reduced by the City building their own	<b>Supplier / Market</b> Impact: Medium Probability: Low Overall: Medium

Risk	Relevant Categories	Highest Rating	Mitigation	Residual Risk
			<p>capabilities with VMI / Consignment models through selecting one vendor for an implementation and then phasing in others.</p> <p>Notably, vendors that were interviewed suggested they had an interest in this model.</p>	
<p><b>Data</b></p> <p>There is a risk that the City would not have the right forecasting data available to meet the needs of a VMI / Consignment model. Currently, forecasts are developed from historical usage. To engage in this model, vendors may require forecasting based on planned maintenance demands to reduce their risk of obsolescence.</p>	Financial	<p><b>Financial</b></p> <p>Impact: Medium</p> <p>Probability: Low</p> <p>Overall: Medium</p>	<p>The probability of this risk could be reduced through the implementation of a parts forecasting model that integrates planned maintenance. Conversations with vendors would need to include both CPSS and FFS to ensure fleet maintenance has the appropriate input.</p>	<p><b>Operations</b></p> <p>Impact: Low</p> <p>Probability: Low</p> <p>Overall: Low</p>

Source: Based on information provided by the City.



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