

THE CITY OF CALGARY 2013

INFRASTRUCTURE STATUS REPORT





Westbro

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CALGARY Philharmonic
Orchestra
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EPCOR CENTRE

The Calgary Public Library
Library Public
Storage
BOBAY PARKING
HILL
City of Calgary
Canada



Executive Summary

The City of Calgary defines assets to include all physical infrastructure that is necessary to support the social, economic and environmental services provided by The Corporation. In order to more efficiently and effectively use and maintain The City's assets, City Council approved The City of Calgary's Asset Management Strategy and Corporate Asset Management Program in 2005, setting the stage for The City to develop an asset management system. This system is intended to monitor and maintain The City's assets and is the foundation for infrastructure best practices that help The City to provide effective municipal service while balancing smart growth and quality of life.

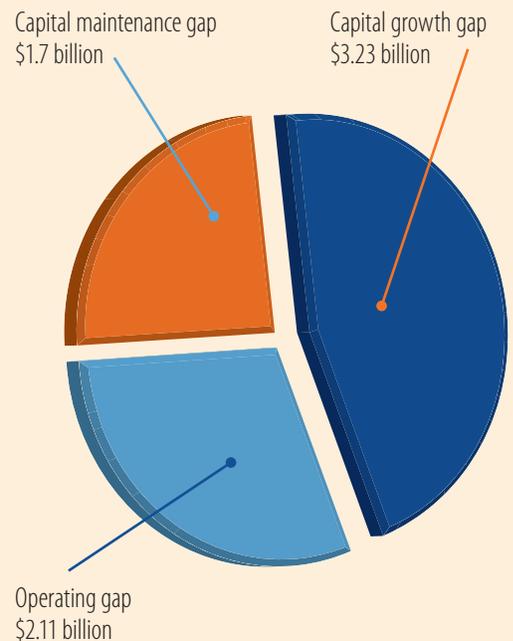
The City's infrastructure assets have increased in value from \$55.14 billion to \$60.48 billion over the past three years. The primary reasons for this increase are the addition of new assets, cost escalation and inflationary market conditions.

It is estimated that The City's total infrastructure needs, funded and unfunded, over the next 10 years is approximately \$24.11 billion. As The City has plans to fund approximately \$17.07 billion during this time, it has been identified that the total 10-year infrastructure funding gap is approximately \$7.04 billion.

In order to help close the infrastructure gap it will be critical to align condition assessments with a risk management strategy and well-defined levels of service, across the different business units. This integrated approach to asset management will be vital in bringing about consistent asset management practices across all areas of The Corporation, as well as ensuring that the use of assets is optimized. To begin the integration process, the following steps will be, or have already begun to be, undertaken:

1. Formalize condition assessments.
2. Establish standard performance monitoring mechanisms.
3. Adopt risk management as a core business driver.
4. Define and align levels of service to asset performance.

INFRASTRUCTURE FUNDING GAP \$7.04 BILLION



* The 2013 Infrastructure Status Report does not include the approximately \$13 billion in Transit projects from RouteAhead which have not been approved by Council, as well as those beyond the next ten years.

Introduction

Overview and history

The City of Calgary defines assets to include all physical infrastructure that is necessary to support the social, economic and environmental services provided by The Corporation. In order to more efficiently and effectively use and maintain The City's assets, City Council approved The City of Calgary's Asset Management Strategy and Corporate Asset Management Program in 2005, setting the stage for The City to develop an asset management system. This system is intended to monitor and maintain The City's assets and is the foundation for infrastructure best practices that help The City to provide effective municipal service while balancing smart growth and quality of life.

In general, it is at the business unit (BU) level where assets are assessed, maintained, and where recommendations are made for infrastructure growth. All of this work is completed with operational, strategic, and governance support from The Corporate level asset management

team and it's this work that forms the basis of The City's asset management system. The asset management system is underscored by a process of continuous improvement based on the cycle of plan, do, check, act. The three documents listed below are important parts of this cycle:

1. Infrastructure Status Report (ISR) – Corporate-level document which includes BU data and reports on the overall state of City assets.
2. State of Asset Management report – Corporate indicator of BU level asset management practices – progress, challenges and achievements.
3. Corporate Asset Management Plan (CAMP) – Corporate plan comprised of individual BU asset management plans.

The current replacement value and age data for the 2013 Infrastructure Status Report is based on The City's portfolio of assets as of Jan. 1, 2013.

Asset Management System

This report is a key part of The City of Calgary's asset management system, as noted earlier. The 2013 version of the ISR is the fourth iteration of the document and it will continue to be an important document for helping to mitigate risk throughout The Corporation, as well as serving as a guide for helping City Council make informed infrastructure investment decisions.

The ISR reports at the asset portfolio level, rolling up information and data from individual assets. That means assessments can be made about how well our assets are achieving their strategic objectives in terms of delivering outcomes against required levels of service. Levels of service are currently determined within each business unit and vary throughout The Corporation.

The 2013 ISR represents pre-flood data, reflective of The City's portfolio of assets as of Jan. 1, 2013.



Purpose

Calgary's Asset Management Strategy identified 11 essential elements of an effective asset management system. The four elements listed below guide the development of the ISR:

1. An accurate and consistent inventory for all municipal infrastructure.
2. Continual infrastructure status reporting to enable asset stewards to develop infrastructure investment priorities.
3. Alignment between service and infrastructure decisions with future urban form goals.
4. Benchmarking to measure infrastructure performance.

As a result, the ISR provides answers to five key questions:

1. What do we own?
2. What is it worth?
3. What condition is it in?
4. What is its remaining service life?
5. What is the infrastructure funding gap?

The benefits of knowing the answer to these questions assists with the:

- Ability to plan for and manage the delivery of the required level of service.
- Avoidance of premature asset failure.
- Risk management associated with asset failures, and mitigation of the consequences of failure.
- Accurate prediction of future expenditure requirements through understanding remaining asset life and capital investment needs.

Report Overview

This report will begin to answer the five key questions noted above, first at a Corporate level and then broken down by each asset portfolio. Conclusions and next steps follow.

Methodology

Although there are many commonalities across BUs, in terms of how they manage their assets and record asset data and transactions, there are also many differences. In order to complete the ISR in a consistent manner the following methodology was undertaken:

- The largest BUs (that comprise over 99 per cent of The City's asset value) were contacted to provide their asset data.
- Infrastructure & Information Services (IIS) acted in a supporting and co-ordinating role to collect asset data from the BUs. This included:
 - Developing a standard template for each BU to input data.
 - Providing a cost escalation methodology to each BU which can be used if no other methodology is in place.
 - Providing People Soft Asset Management Data (PSAM) data to each BU as one option for conducting their analyses.
- Engaging each BU to identify any concerns and answer questions.
- IIS consolidated the data, conducted an analyses and made recommendations for next steps.
- IIS compiled the final report based on the data collected and the analysis.

The Infrastructure Status Report provides answers to five key questions:

- 1. What do we own?**
- 2. What is it worth?**
- 3. What condition is it in?**
- 4. What is its remaining service life?**
- 5. What is the infrastructure funding gap?**





What do we own?

The City of Calgary’s infrastructure asset portfolio is made up of: buildings, engineered structures, land, land improvements, machinery and equipment, and vehicles.

What is it worth?

As of Jan. 1, 2013, the total value of The City of Calgary’s infrastructure asset portfolio is \$60.48 billion, up from \$55.15 billion in 2010.

What condition is it in?

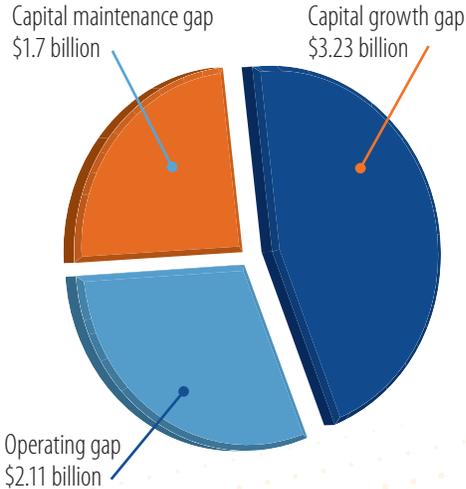
More than 95 per cent of The City’s infrastructure assets are in good or very good physical, demand and functional condition. Approximately 1.35 per cent of The City’s assets are in poor physical condition.

What is the average remaining life?

The average remaining life varies by asset portfolio.

What is the infrastructure gap?

The 10-year infrastructure funding gap is \$7.04 billion. The gap has dropped from the \$7.4 billion gap reported in 2010. The breakout of the infrastructure gap is shown below.



* The 2013 Infrastructure Status Report does not include the approximately \$13 billion in Transit projects from RouteAhead which have not been approved by Council, as well as those beyond the next ten years.

Corporate infrastructure status – Overview

What do we own?

In a broad sense, The City's asset base is comprised of five major asset portfolios:

1. Buildings
2. Machinery and equipment
3. Engineered structures
4. Vehicles
5. Land improvements

Engineered structures (87 per cent) make up the majority of The City's asset base, followed by Buildings (six per cent), Land improvements (three per cent), Vehicles (two per cent), and Machinery and equipment (one per cent).

In addition to these major asset portfolios, The City also has land holdings. Land does not, however, depreciate like the other assets and does not require the same level of maintenance.

What is it worth?

The City's total asset base has a replacement value of \$60.48 billion with a breakdown by asset category summarized in the chart at left. Engineered Structures comprise approximately \$52.70 billion of the total, followed by Buildings at \$3.72 billion, Land improvements at \$1.83 billion, Vehicles at \$1.52 billion, and Machinery and equipment at \$0.71 billion.

What condition is it in?

There are three types of condition assessments: physical, demand, and functional.

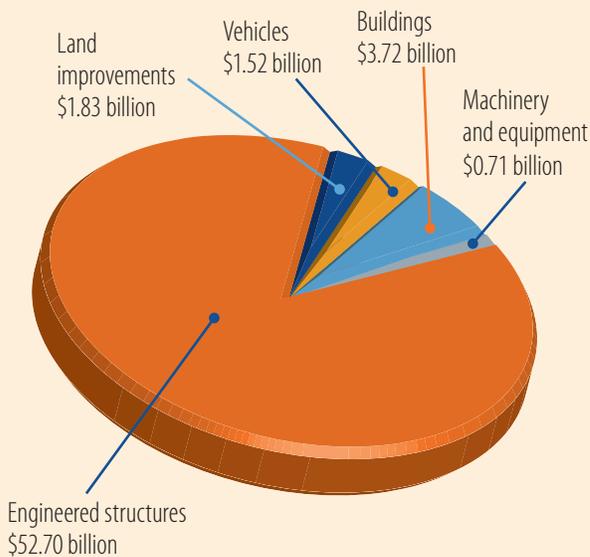
Physical

Physical condition reflects the physical state of the asset, which may or may not affect its performance. The performance of the asset is the ability to provide the required level of service to customers in terms of reliability, availability, capacity, and meeting customer demands and needs. All of this is critical information for determining the remaining useful life of an asset and more importantly the timing for possible intervention steps to help bring levels of service to a desired standard.

Demand

Demand condition assessments examine asset capacity over the long-term. Assets must be utilized effectively in order to provide the maximum return on funds invested and to deliver the required levels of service. Wherever possible the aim should be high utilization of assets.

ASSET VALUE \$60.48 BILLION*



* Does not include \$3.62 billion land holdings owned by The City. Land does not depreciate like other assets and does not require the same level of maintenance.

Functional

Functional assessments deal with the suitability or ‘fitness for purpose’ of the asset. Suitability needs to recognize service needs for current and future purposes. By assessing the suitability of an asset, opportunities for varying the level of service, and hence the cost of service, can be considered.

The rating scale for the three condition assessments are below.

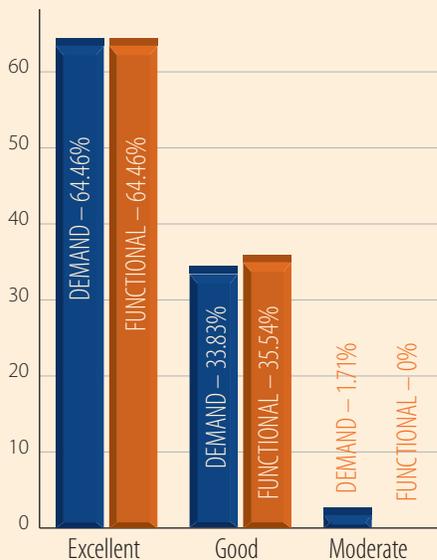
CONDITION ASSESSMENT RATING SCALE

CONDITION CATEGORY	DESCRIPTION	RATING SCALE
Physical	Physical deterioration of the asset.	Very good – Sound or “as new” condition
		Good – Acceptable physical condition. Asset shows only minor deterioration.
		Fair – Tolerable physical condition. Moderate deterioration evident.
		Poor – Major deterioration evident.
		Critical – Asset deteriorated to such an extent that it is generally inoperable or unsafe.
Demand	The asset’s capacity to deal with long-term demand or usage.	Excellent – The asset has capacity to comfortably deal with long-term demand, loading or usage requirements.
		Good – The asset has capacity to comfortably deal with medium-term demand, loading or usage requirements, but may have minor long-term shortcomings.
		Moderate – The asset’s design and function are generally aligned with its current purpose although there may be some minor shortcomings.
		Borderline – The asset is operating near the limits of its design parameters and only has capacity to deal with short-term demands, loading or usage requirements.
		Fail – The asset is already operating at the limits of/or in excess of its design parameters and/or is incapable of meeting any short-term demands, loading or usage requirements.
Functional	The level of alignment with the asset’s current purpose.	Excellent – The asset’s design and function are fully aligned with its current purpose.
		Good – The asset’s design and function are well aligned with its current purpose.
		Moderate – The asset’s design and function are generally aligned with its current purpose although there may be some minor shortcomings.
		Borderline – The asset’s design and function are only partially aligned with its current purpose and there are significant shortcomings.
		Fail – The asset’s design and function are substantially misaligned with its current purpose.

OVERALL PHYSICAL CONDITION (BASED ON BUSINESS UNIT AVERAGES)



OVERALL DEMAND AND FUNCTIONAL CONDITION (BASED ON BUSINESS UNIT AVERAGES)



The overall condition assessments on this page are based on averages across the major asset categories. As a result there may be critical areas within each of the asset portfolios (see Appendix 3).

At an aggregate portfolio level, over 95 per cent of The City's assets are in good physical condition with approximately three per cent in fair condition and one per cent in poor condition. (See Appendix #3).

Examining demand and functional condition at a portfolio level we see that our assets are generally in good or excellent condition. This data is based on the averages of each BU and a breakdown is available by portfolio in the following section of the report.

What is the remaining asset life?

Another important piece of information to have when making infrastructure investment decisions is the remaining asset life within each major asset portfolio. This metric can help to illustrate where and when upgrades and replacements may be required. It is important to understand that a long remaining useful life doesn't necessarily mean that the asset is in good physical, demand, or functional condition. On the other hand a negative useful life doesn't always mean the asset requires replacement. The asset still may be meeting its required level of service or can continue with maintenance.

AVERAGE REMAINING ASSET LIFE (YEARS)*

22 YEARS



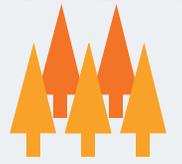
BUILDINGS

36 YEARS



ENGINEERED
STRUCTURES

6.5 YEARS



LAND
IMPROVEMENTS

-3 YEARS



MACHINERY AND
EQUIPMENT

6 YEARS



VEHICLES

* Negative values indicate assets being used beyond their expected life.

What is the infrastructure gap?

The City of Calgary has identified that the current replacement value of its existing assets is approximately \$60.48 billion. With such an extensive asset base, it is vital to understand the requirements for maintaining and upgrading these assets. The table below outlines estimates for operational, maintenance, and growth funding requirements over the next 10 years.

It is estimated that The City's total infrastructure needs, funded and unfunded, over the next 10 years is approximately \$24.11 billion. As The City has plans to fund approximately \$17.07 billion during this time, it has been identified that the total 10-year infrastructure gap is approximately \$7.04 billion.* Of that, approximately \$2.11 billion is attributable to operating, \$1.7 billion is unfunded infrastructure maintenance and \$3.23 billion is for new construction due to growth. As the business planning and budgeting process has spanned three-year periods (moving to four as part of the 2015–2018 Action Plan), the long-term portion of the funding gap has not been fully realized.

Trends

The operating gap continues to grow as a result of an additional \$5.34 billion in assets, the impacts of inflation, as well as an improved understanding of the operating impacts of capital. Certain BUs experience a higher level of an operating shortfall which may impact their ability to maintain their service delivery and infrastructure integrity over time.

The capital maintenance gap has dropped by more than \$1.5 billion since 2010. This indicates that additional commitments have been made to maintaining The City's assets in combination with BUs better understanding how to manage levels of service and risk.

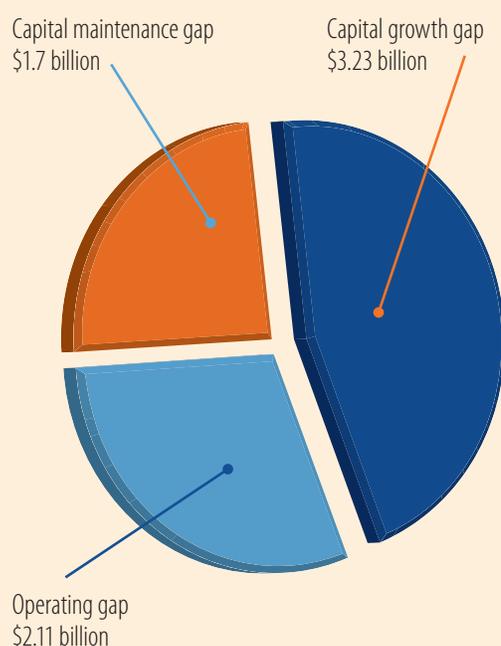
Similar to the operating gap, certain BUs are reporting a larger funding shortfall compared to their investment requirements. The capital growth gap has increased slightly since 2010, but remains steady as growth projections have not changed significantly and there has been little change in funding projections.

At an aggregate level, the expected and remaining asset life values have decreased. This decrease can be explained by the deterioration of existing in-service infrastructure as well as a better understanding of our asset base. There are individual BUs which are reporting that the overall remaining life of their infrastructure is approaching or has exceeded its expected asset life. In order to maintain the services provided by these BUs there is a need to prioritize a catch-up investment to address the aging condition of their infrastructure.

INFRASTRUCTURE GAP (\$BILLIONS)

	OPERATING	CAPITAL MAINTENANCE	CAPITAL GROWTH	TOTAL
REQUIRED	10.39	6.64	7.08	24.11
FUNDED	8.27	4.94	3.86	17.07
GAP	2.11	1.70	3.23	7.04

INFRASTRUCTURE GAP \$7.04 BILLION



* The 2013 Infrastructure Status Report does not include the approximately \$13 billion in Transit projects from RouteAhead which have not been approved by Council, as well as those beyond the next ten years.

TRENDS

The following table shows the gap, remaining life and value of The City of Calgary's infrastructure assets.

		2004	2007	2010	2013
GAP (\$BILLION)	Operating	0.5	0.76	0.86	2.11
	Maintenance	2.3	2.67	3.23	1.70
	Growth	2.5	6.96	3.31	3.23
	Total	5.3	10.4	7.4	7.04
AGE (YEARS)	Expected	68	65	67	59
	Remaining	31	31	43	32
VALUE (\$BILLION)		27	54	55.14	60.48

The City's asset value has increased by \$5.34 billion since 2010 due to the following factors:

- Additional inventory.
- Cost escalation and inflationary market conditions.
- More sophisticated valuation techniques.

The physical, functional and demand condition results in 2013 showed significant overall improvement from 2010 and prior years. The improvement is due to new infrastructure in place,

which off-sets the decline of infrastructure in other areas. In addition, better assessment and maintenance of assets has contributed to the improved condition.

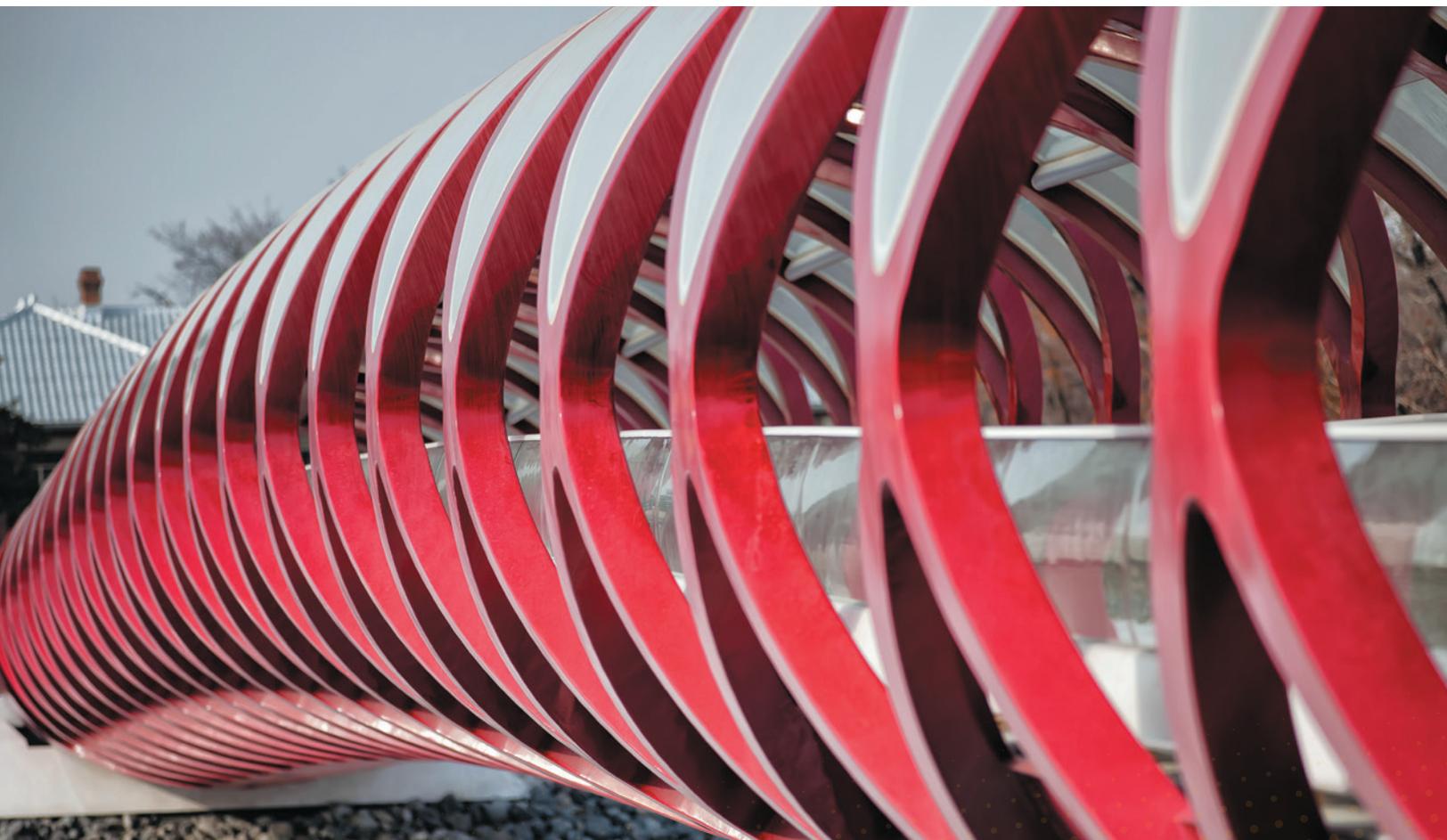
BUs show approximately 1.5 per cent of current assets in poor to critical physical condition. This may mean a need for immediate investment; however, further analysis is required to better understand the risks associated with these assets and the level of service required from them.

PHYSICAL, FUNCTIONAL AND DEMAND CONDITION TRENDS

	PHYSICAL CONDITION			FUNCTIONAL CONDITION			DEMAND CONDITION		
	Good*	Fair	Poor	Good**	Moderate	Borderline	Good**	Moderate	Borderline
2004	80%	14%	6%	85%	11%	4%	87%	8%	5%
2007	76%	17%	7%	82%	15%	3%	54%	14%	2%
2010	78%	16%	6%	91%	7%	2%	91%	7%	2%
2013	95%	3.5%	1.5%	100%	0%	0%	98%	2%	0%

* Very Good and Good combined for comparison to prior years.

** Excellent and Good combined for comparison to prior years.



Asset portfolio overview

Buildings

What do we own?

Examining the Buildings portfolio of assets we see the majority of The City's buildings are located within three business units: Corporate Properties & Buildings (CPB), Office of Land Servicing & Housing (OLSH) and Recreation.

What is it worth?

The total value of the Buildings portfolio is approximately \$3.72 billion or six per cent of the total asset base.

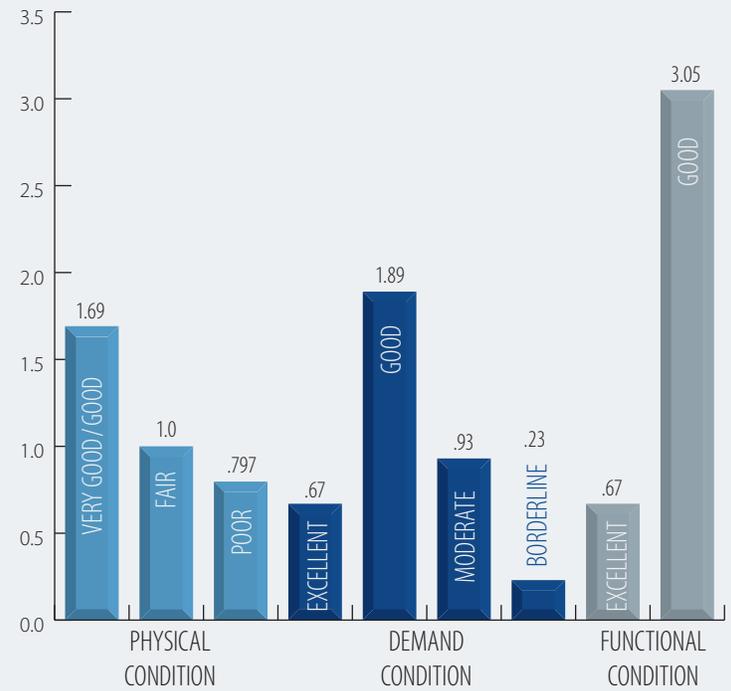
What condition is it in?

The physical, demand and functional condition of The City's assets are generally good; however some areas are rated as poor and if not maintained will deteriorate to critical condition.

What is the remaining asset life?

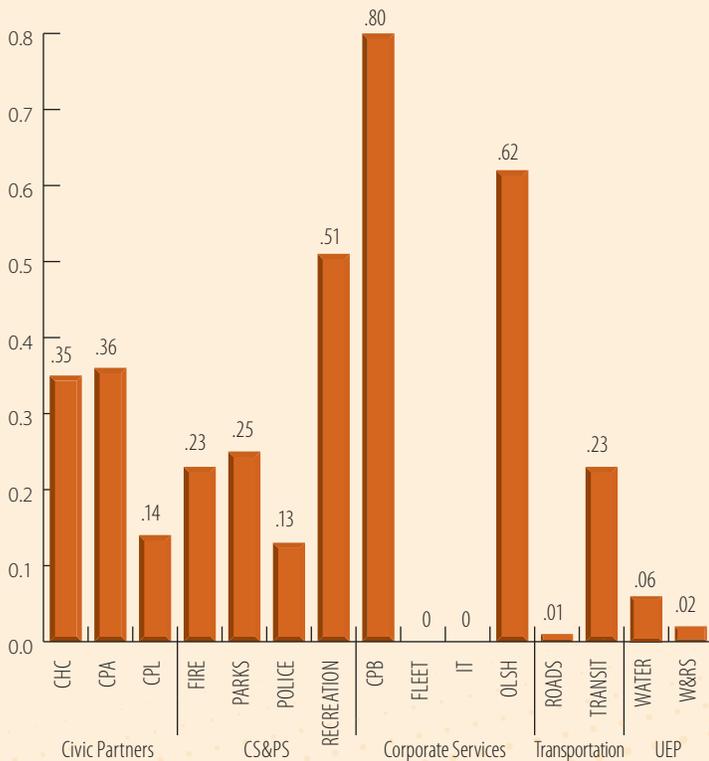
The average remaining asset life for the Buildings portfolio is approximately 22 years.

BUILDINGS AVERAGE PHYSICAL CONDITION (\$BILLION)*



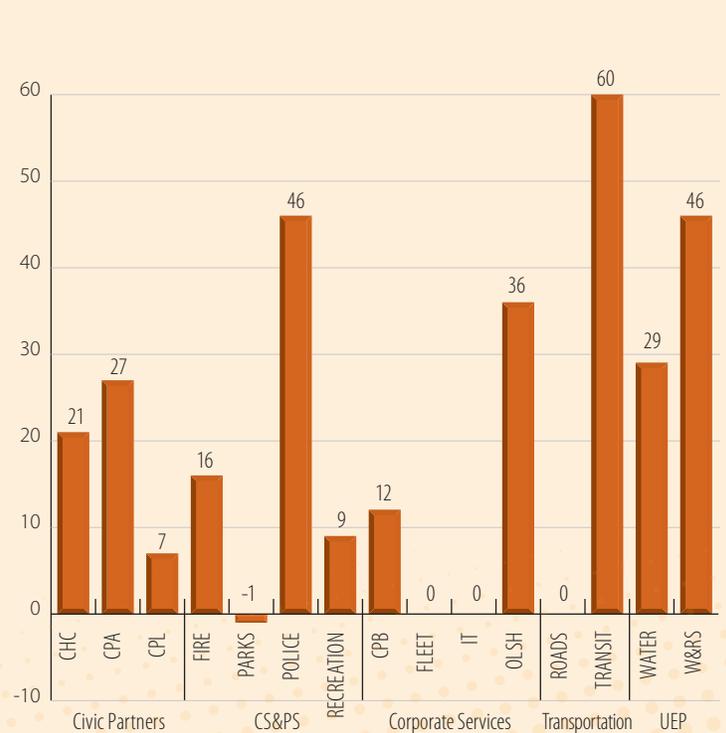
* Percentages and figures in this chart have been rounded.

BUILDINGS VALUE BY DEPARTMENT (\$BILLION)*



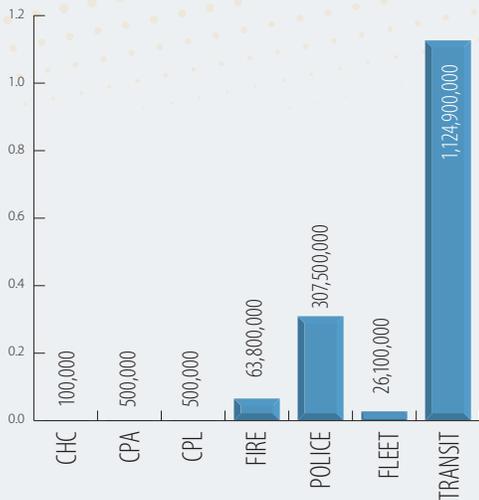
* Percentages and figures in this chart have been rounded.

BUILDINGS AVERAGE REMAINING ASSET LIFE (YEARS)*



* Negative values indicate assets being used beyond their expected life.

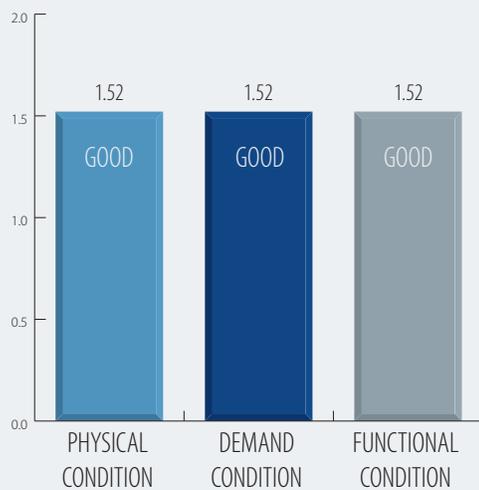
VEHICLES VALUE BY DEPARTMENT (\$BILLION)*



Departments with no vehicle assets have not been shown.

* Percentages and figures in this chart have been rounded.

VEHICLES AVERAGE CONDITION (\$BILLION)*



* Percentages and figures in this chart have been rounded.

Vehicles

What do we own?

Examining the Vehicles portfolio of assets we see Transit holds the majority of vehicles (by value) followed by Fleet.

What is it worth?

The total value of the Vehicles portfolio is approximately \$1.52 billion or two per cent of the total asset base.

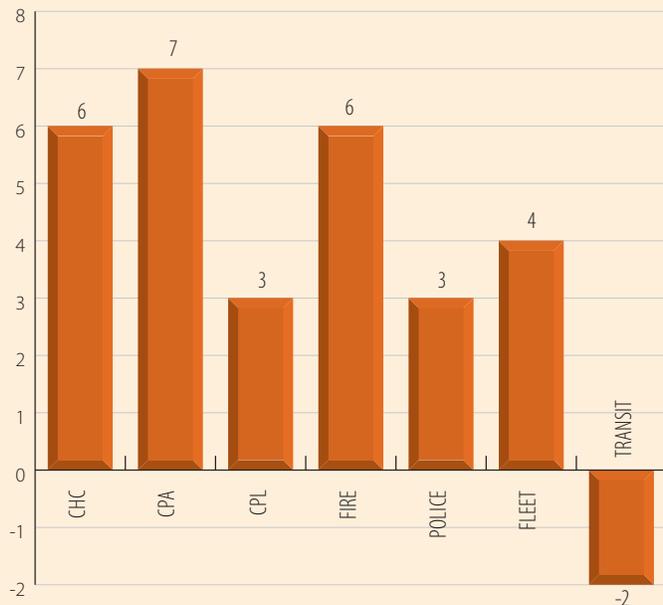
What condition is it in?

The physical, demand, and functional condition of The City's vehicles are, on average, good across the business units.

What is the remaining asset life?

The remaining asset life for the Vehicles portfolio is approximately six years.

VEHICLES AVERAGE REMAINING ASSET LIFE (YEARS)*



Business units with no vehicle assets have not been shown.

* Negative values indicate assets being used beyond their expected life.



Machinery and equipment

What do we own?

Examining the Machinery and equipment portfolio of assets we see the majority of The City's Machinery and equipment assets are located within IT.

What is it worth?

The total value of the Machinery and equipment portfolio is approximately \$710 million or one per cent of the total asset base.

What condition is it in?

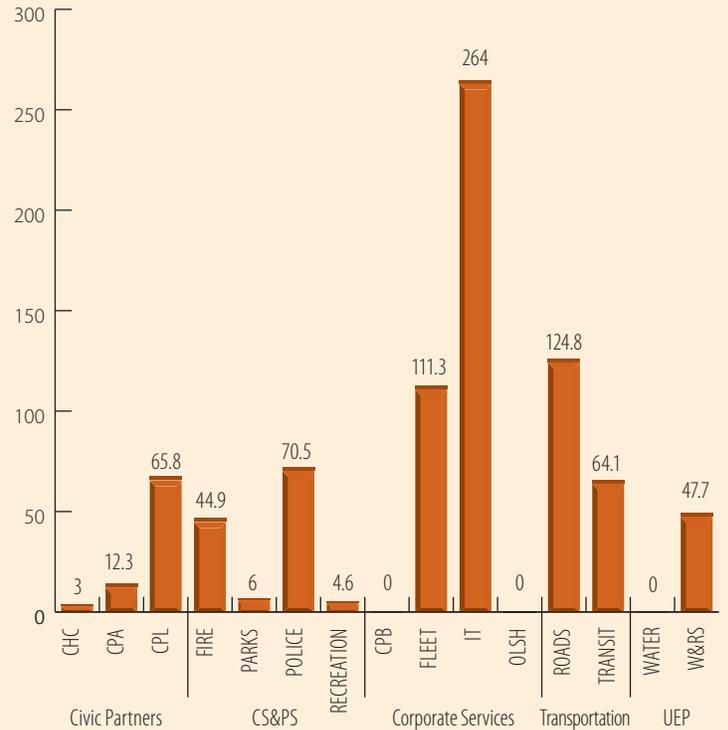
The physical, demand, and functional condition of The City's Machinery and equipment are generally good.

What is the remaining asset life?

The average remaining asset life for the Machinery and equipment portfolio is approximately -3 years*.

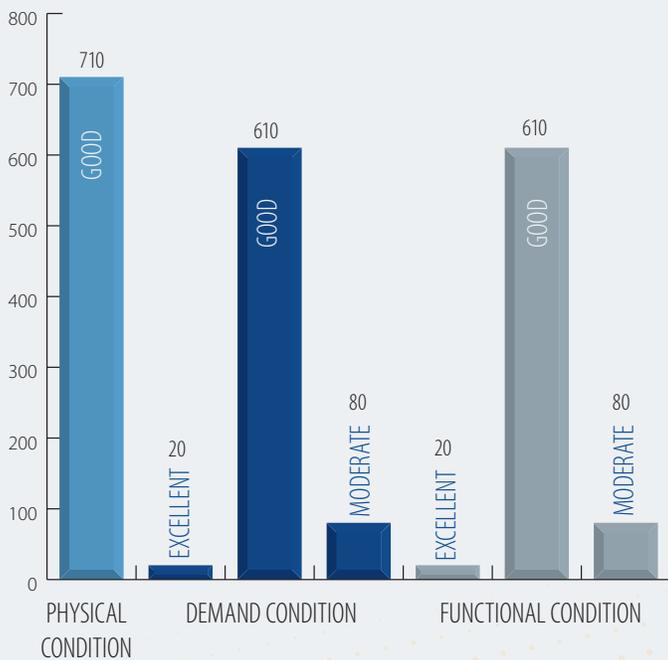
* Negative values indicate assets being used beyond their expected life.

MACHINERY AND EQUIPMENT ASSET VALUE (\$MILLION)*



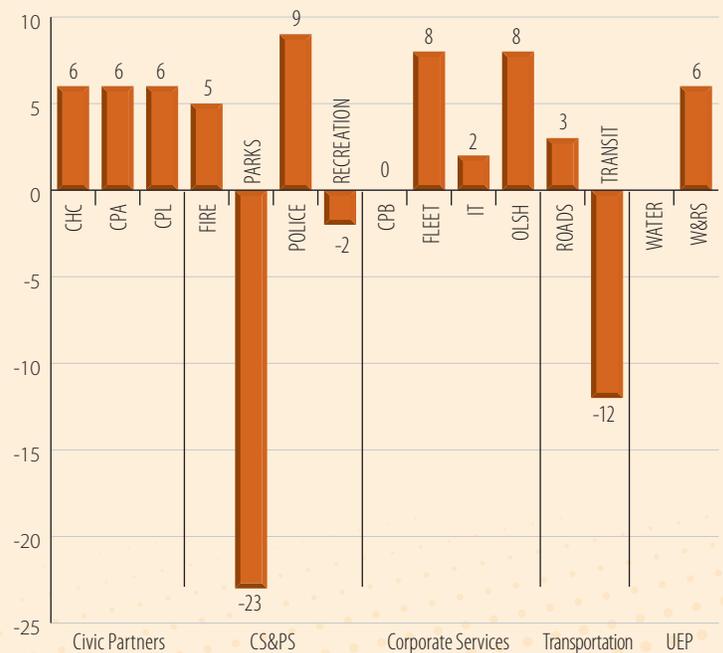
* Percentages and figures in this chart have been rounded.

MACHINERY AND EQUIPMENT CONDITION (\$MILLION)*



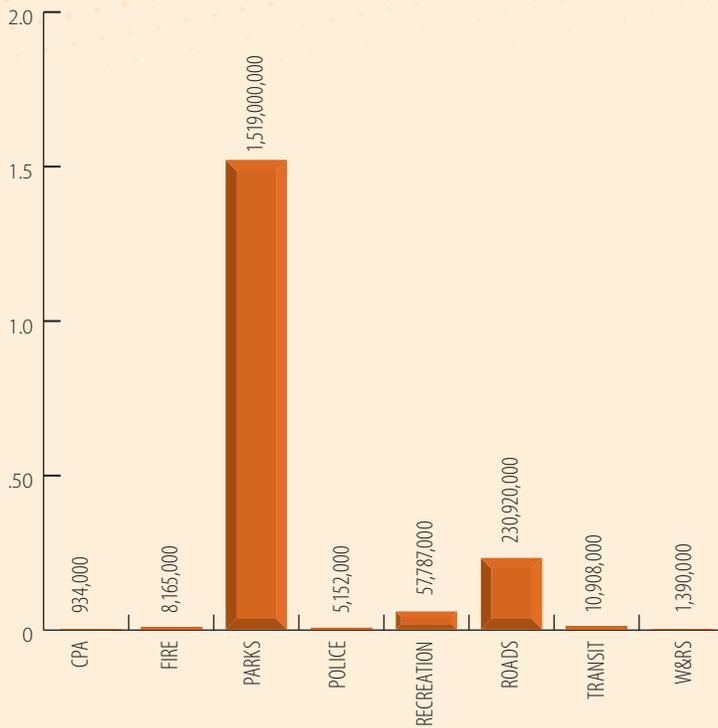
* Percentages and figures in this chart have been rounded.

MACHINERY AND EQUIPMENT AVERAGE REMAINING ASSET LIFE (YEARS)*



* Negative values indicate assets being used beyond their expected life.

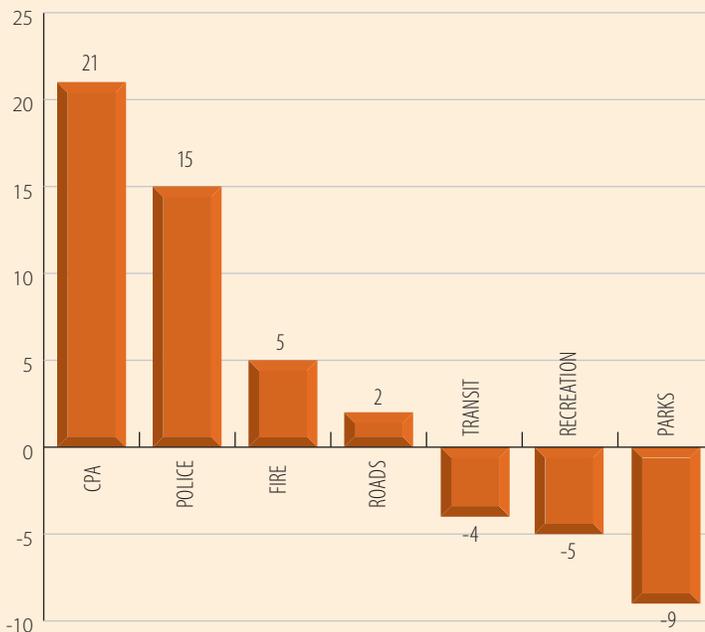
LAND IMPROVEMENTS VALUE BY DEPARTMENT (\$BILLION)*



Business units with no land improvement assets have not been shown.

* Percentages and figures in this chart have been rounded.

LAND IMPROVEMENTS AVERAGE REMAINING ASSET LIFE (YEARS)*



Business units with no land improvement assets have not been shown.

* Negative values indicate assets being used beyond their expected life.

Land improvements

What do we own?

Examining the Land improvements portfolio of assets we see the majority of The City's land improvements are located within Parks.

What is it worth?

The total value of the Land improvements portfolio is approximately \$1.83 billion or three per cent of the total asset base.

What condition is it in?

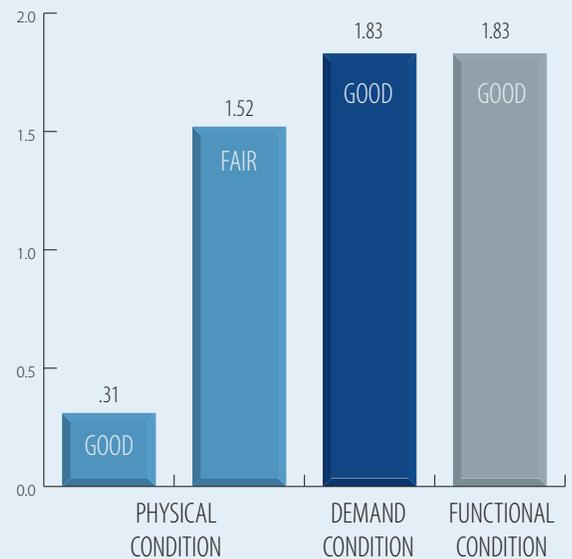
The physical condition of The City's Land improvements are generally fair and should be monitored to ensure these assets do not fall into the poor or critical categories.

The demand and functional conditions of The City's Land improvements are generally good.

What is the remaining asset life?

The remaining asset life for the Land improvement portfolio is approximately 6.5 years; however, there are some areas where assets appear to have exceeded their useful life and should be further examined.

LAND IMPROVEMENTS AVERAGE CONDITION (\$BILLION)*



* Percentages and figures in this chart have been rounded.

Engineered structures

What do we own?

Examining the Engineered structures portfolio of assets we see the majority of The City's engineered structures are located within Water.

What is it worth?

The total value of the Engineered structures portfolio is approximately \$52.70 billion or 87 per cent of the total asset base.

What condition is it in?

The significant majority of The City's Engineered structures are in good physical condition.

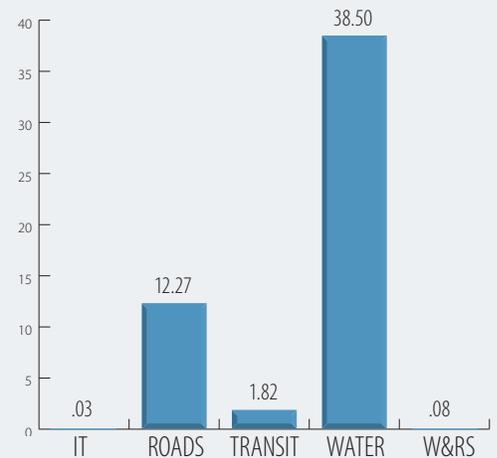
The demand and functional condition of The City's Engineered structures are generally excellent.

What is the remaining asset life?

The average remaining asset life for the Engineered structures portfolio is approximately 35 years.



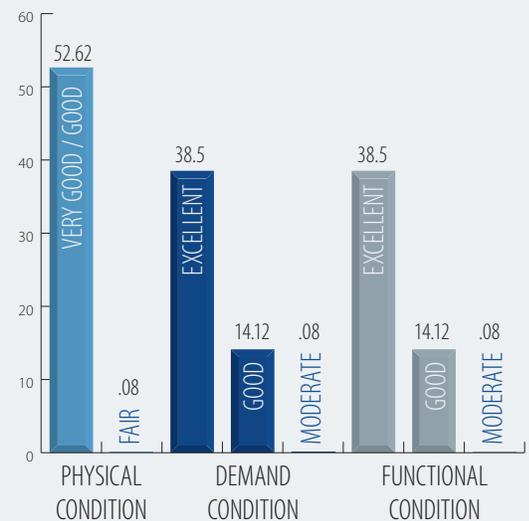
ENGINEERED STRUCTURES VALUE BY DEPARTMENT (\$BILLION)*



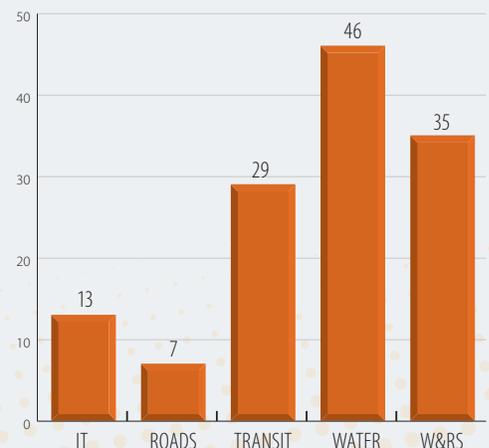
Business units with no engineered structure assets have not been shown.

* Percentages and figures in this chart have been rounded.

ENGINEERED STRUCTURES AVERAGE CONDITION (\$BILLION)



ENGINEERED STRUCTURES AVERAGE REMAINING ASSET LIFE (YEARS)



Business units with no engineered structure assets have not been shown.

Conclusions and next steps

Conclusions

Overall, the physical, functional and demand condition results show significant improvement from previous years.

Over the past three years, The City's infrastructure assets have increased in value from \$55.14 billion to \$60.48 billion. The primary reason for the increase in inventory replacement includes:

- Additional inventory.
- Cost escalation and inflationary market conditions.
- More sophisticated valuation techniques.

Over the next 10 years, The City of Calgary will require an additional investment of \$7.04 billion (not including \$13 billion in unvetted RouteAhead projects) to fund infrastructure maintenance, growth, and operating requirements.

Over the next 10 years, current financing sources are not sufficient to fund projected medium-term projected capital maintenance programs.

Over the next 10 years, currently identified financing sources fall short of projected population or service growth requirements by \$3.23 billion.

Next steps

The data from the Infrastructure Status Review has helped to answer the five questions outlined at the beginning of this report:

1. What do we own?
2. What is it worth?
3. What condition is it in?
4. What is its remaining service life?
5. What is the infrastructure funding gap?

The question now is how to best use this data to support the Corporate Asset Management System? This is a critical question, as a well-defined and supported asset management system is required to help close the funding gap over the next 10 years. Specifically, moving forward it will be critical to align condition assessments with a risk management strategy and well-defined levels of service to better use City assets and prioritize maintenance and growth projects.

Currently each business unit uses different strategies for determining levels of service for their assets, managing risk and maintaining their assets. Moving forward, an integrated asset management system will be vital in bringing forward consistent asset management practices and optimizing the use of the assets across The Corporation. To begin the integration process, the following steps will be, or have already begun to be, undertaken:

1. Formalize condition assessments.
2. Establish standard performance monitoring mechanisms.
3. Adopt risk management as a core business driver (draft risk standards are nearing completion).
4. Define and align levels of service to asset performance (level of service standards are currently being developed).

Formalize condition assessments

Each business unit currently has an independent strategy for conducting condition assessments and, as a result, it is difficult to report at a Corporate level. It is important to develop formal condition assessment techniques and standards to give repeatable and objective assessments.

Performance monitoring

Performance monitoring involves inspection of assets, either fully or by way of appropriate sampling. Management of how the data collected from the inspections is gathered, stored and integrated is critical to minimizing the costs and resource requirements of any asset-owning organization.

It is crucial that this phase is very well planned and managed, with priority given to collecting data which supports financial reporting, performance measurement and technical asset management issues. In all cases, it is essential that the adopted data collection program is fully documented with standards and quality procedures to ensure that the right data is being collected and that asset managers can have confidence in the quality and timeliness of data available for analysis. The ongoing management and maintenance of asset data must be given consideration at the outset of data capture activities.

Managing risk

Risk management is increasingly being viewed as a core business driver that influences all decision-making, rather than an activity undertaken as an isolated process. A Corporate risk management framework needs to be consistently applied across the organization.

The following general principles apply, and the risk management process steps are generally as follows:

- Risk management context: establish the Corporate risk framework, including the criteria against which risk can be evaluated and the responsibilities for risk management.
- Risk identification: identify the risks The City may encounter and explain the impact of those risks on The Corporation.
- Risk analysis: establish a risk rating for each asset group and assess which assets represent the greatest risk for the organization.
- Risk treatment: identify what actions to take to minimize risk at asset or asset portfolio levels.
- Monitor and review: the ongoing process for ensuring risk levels remain acceptable, even if risks change.

Draft risk standards which set the basis for identifying, evaluating and monitoring risk have been developed. Implementation of the standards is expected to begin in 2014.

A critical part of risk management is emergency management. Emergency managers often refer to the risk treatment options as being:

- Reduction/prevention (mitigation to reduce the risk consequence or probability).
- Readiness/preparedness.
- Response and recovery. (The latter two activities relate to managing the consequences of the failure, such as by reducing response and recovery times.)

Asset Management Plans should, at a minimum, identify critical assets, the associated risks and the risk management strategies to address them.

Level of service

Condition assessments, performance monitoring and risk management are all precursors to determining the optimal level of maintenance that should be carried out to ensure assets deliver the standard levels of service required. The main objective of defining levels of service across The Corporation is to articulate the correlation between levels of service, the cost of providing levels of service, and the risks to service delivery. A major challenge for the asset manager is striking the right balance of planned maintenance (inspections, scheduled maintenance etc.) and unplanned maintenance (arising from unexpected failures).

Levels of service standards are currently being written and are expected to be completed in 2014.

Moving forward

A number of assets have been shown to require further investigation throughout this report. Applying the principles, the analysis needs to determine whether:

- The assets are meeting the required level of service.
- These assets are at risk of premature failure.
- A risk management plan is in place for these assets.
- A prediction of future expenditure for these assets has been made and whether appropriate levels of funding are in place.

In addition to investigating assets that are at risk, it is important to ensure that the assets which are in good condition are aligned to their required levels of service. To ensure this happens, it is vital that an integrated asset management system is in place that will align condition assessments and will include a risk management strategy with well-defined levels of service. This will also help to create a rigorous financial strategy that can be implemented with the intent of better asset use and improved prioritization of maintenance and growth projects.

Appendix #1

Sources of data and related reports

The current replacement value and age data for the 2013 Infrastructure Status Report (ISR) is based on The City's portfolio of assets as of Jan. 1, 2013.

The City of Calgary also reports the value of its infrastructure assets in its annual financial statements. These statements report depreciated asset values based on original purchase costs depreciated over that asset's useful life in accordance with the Public Sector Accounting Board's, PS3150 Tangible Capital Asset reporting requirements. These depreciated asset values differ from current replacement values as reported in the ISR. Original purchase cost can form a basis for defining associated asset values through applying escalation rates based on purchase date and original asset costs where current values are not available. Current replacement value or perceived market value is often difficult

to verify and will vary depending on market conditions and inflation. Thus, the basis of the value reported in The City's financial report differs from the replacement values reported in the Infrastructure Status Report.

The condition-related information was supplied by each business unit (BU). Funded operating budget figures are based on current year approved operating budgets extrapolated for the next 10 years. Funded and unfunded capital budget numbers are based on data from the Capital Budget System and further validated by representatives within each BU. This data was consolidated by Corporate Asset Management, then vetted and approved by each involved BU.

Three City of Calgary documents rely on information contained in

the 10-year Capital Plan prepared by various business units to consider infrastructure projections. While these three documents are related, each has a different focus and target audience.

Strategic Growth and Capital Investment (SGCI) deals with future infrastructure capital requirements related to population growth, including the geographic location of new infrastructure. It is also part of The City's strategy to manage growth by establishing a framework to inform key decisions in the planning process and ensure alignment of municipal capital projects related to growth.

The Long Range Financial Plan (LRFP) projections include infrastructure, but extend to cover all City operations, including non-infrastructure services plus financial impacts and strategies.



		REPORT TO COUNCIL		
		STRATEGIC GROWTH AND CAPITAL INVESTMENT (SGCI)	INFRASTRUCTURE STATUS REPORT (ISR)	LONG RANGE FINANCIAL PLAN (LRFP)
10-YEAR PROJECTIONS	10-year funded amount for infrastructure assets		✓	✓
	10-year unfunded amount for infrastructure assets		✓	✓
	Capital growth of infrastructure assets (funded and unfunded)	✓	✓	✓
	Capital maintenance projections for infrastructure assets		✓	✓
	Operating maintenance projections for infrastructure assets		✓	Partial (projection of current funding level)
	Condition and age, current replacement value, criticality, at risk asset value		✓	✓
	Annual capital expenditures based on estimated carry forwards (50 per cent deferred each year of plan)			✓
	Operating projections for non-infrastructure services			✓
	Statement of financial position including all financial and infrastructure assets			✓
Financial goals & strategies				✓
Mapping capital growth projects		✓		
Growth, maintenance, upgrades, servicing summary by business unit		✓	✓	
Five, 10, and 15-year population projections		✓		
Operational framework for The City's growth management processes		✓		
Market share residential growth trends by planning sector		✓		
Target audience		Policy planners, strategic growth committees, development industry	City Council, strategic growth committees	City Council, senior administration; policy planners; finance, business planning and intergovernmental affairs networks; strategic growth committees
Data source(s)		Capital Budget System (CBS): 10-year Capital Plan	Business unit maintenance management systems, CBS	General ledger (approved operating budget), CBS 10-year capital plan

Appendix #2

Total asset replacement value by business unit

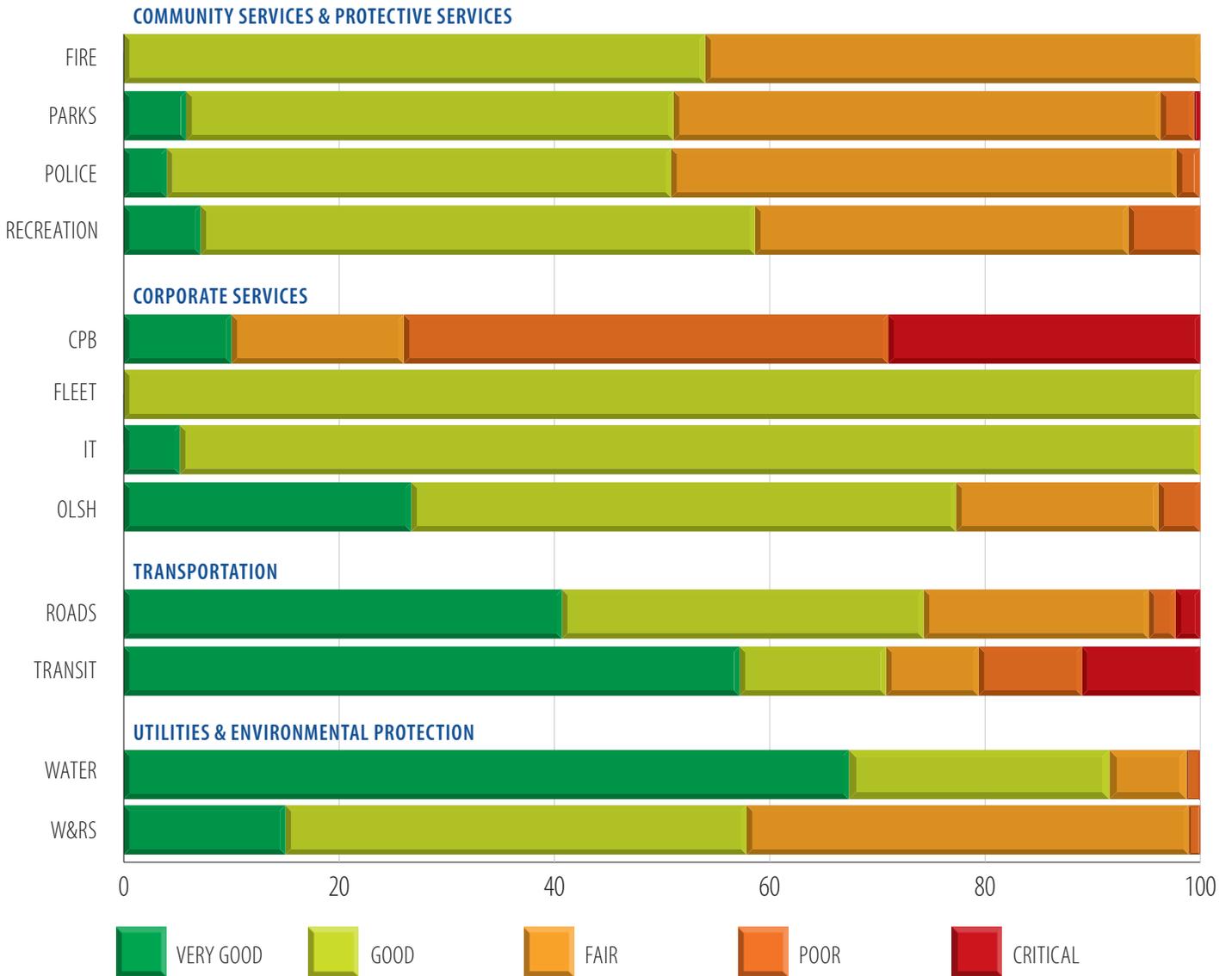
BUSINESS UNIT	REPLACEMENT VALUE (\$BILLION)	PERCENTAGE* (%)
Civic Partners	\$0.93	0.61
Corporate Properties & Buildings	\$0.8	1.32
Fire	\$0.34	0.56
Fleet Services	\$0.31	0.51
Information Technology	\$0.29	0.5
Office of Land Servicing & Housing	\$0.62	1.02
Parks	\$1.78	2.94
Police	\$0.24	0.40
Recreation	\$0.57	0.94
Roads	\$12.52	20.71
Transit	\$3.24	5.36
Waste & Recycling Services	\$0.10	0.17
Water Services/Water Resources	\$38.61	63.86
TOTAL	\$60.48	100%

* May not add up to 100 per cent due to rounding.



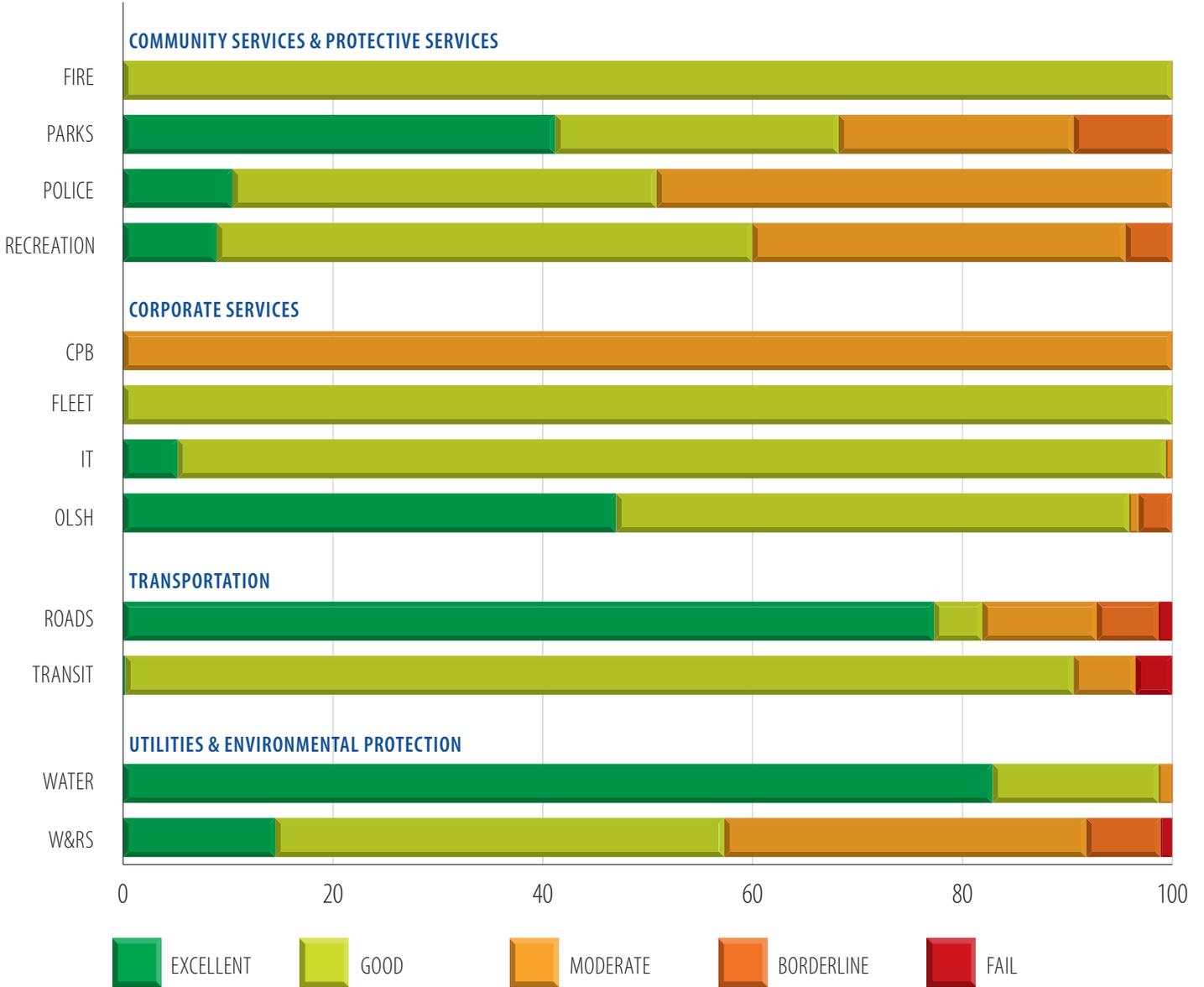
Appendix #3

Physical condition by business unit (percentage)



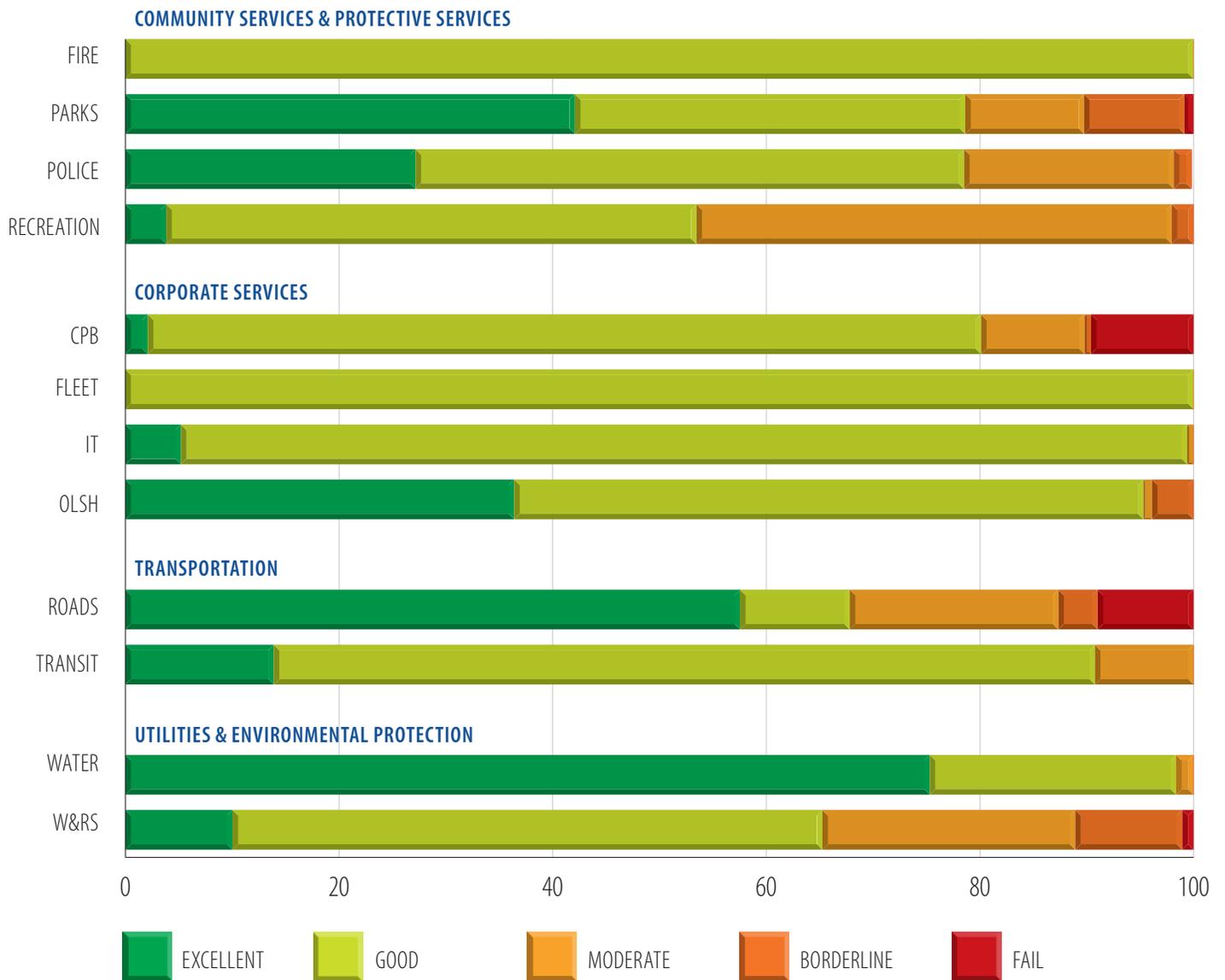
Appendix #3 continued

Demand condition by business unit (percentage)



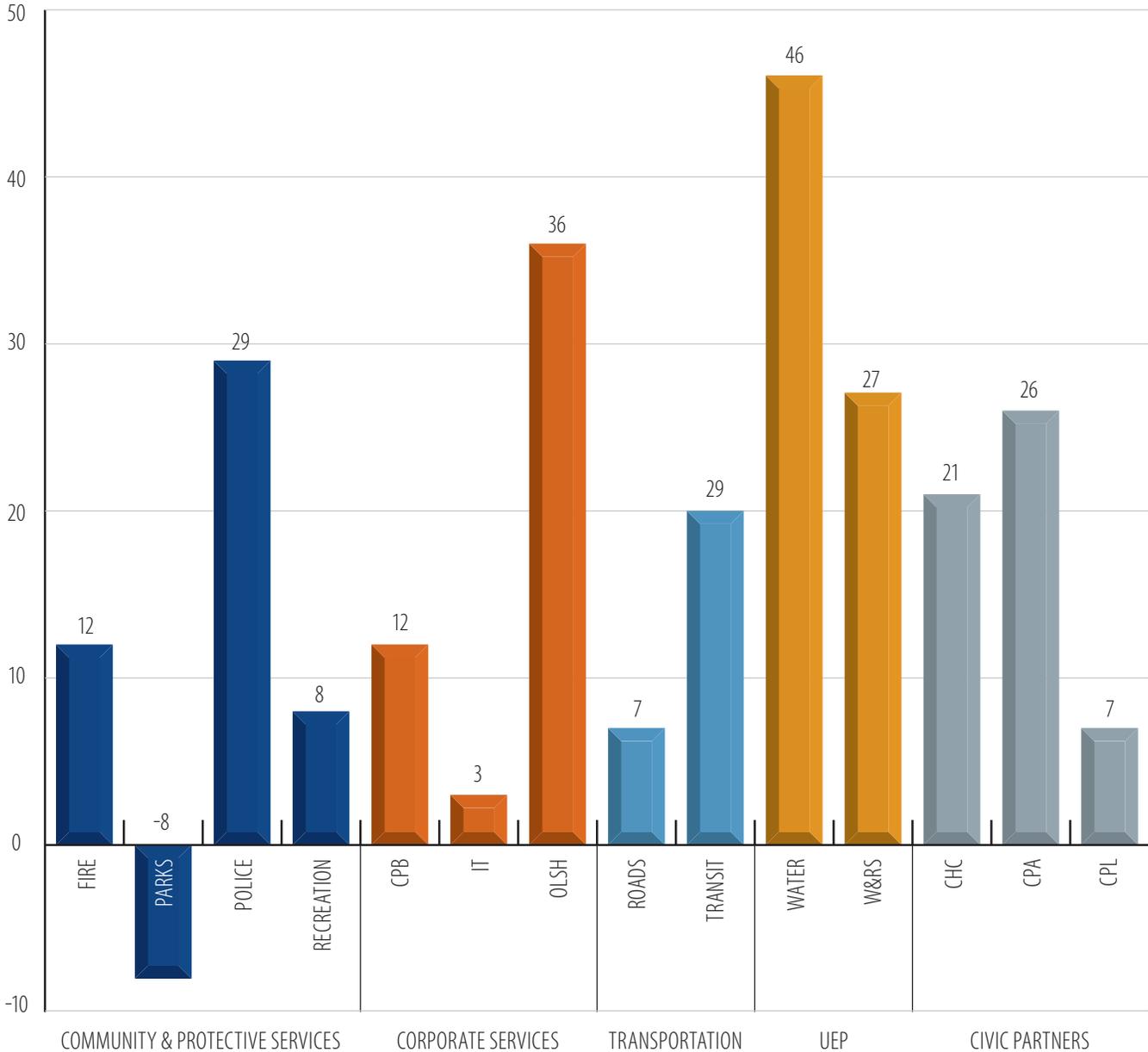
Appendix #3 continued

Functional condition by business unit (percentage)



Appendix #4

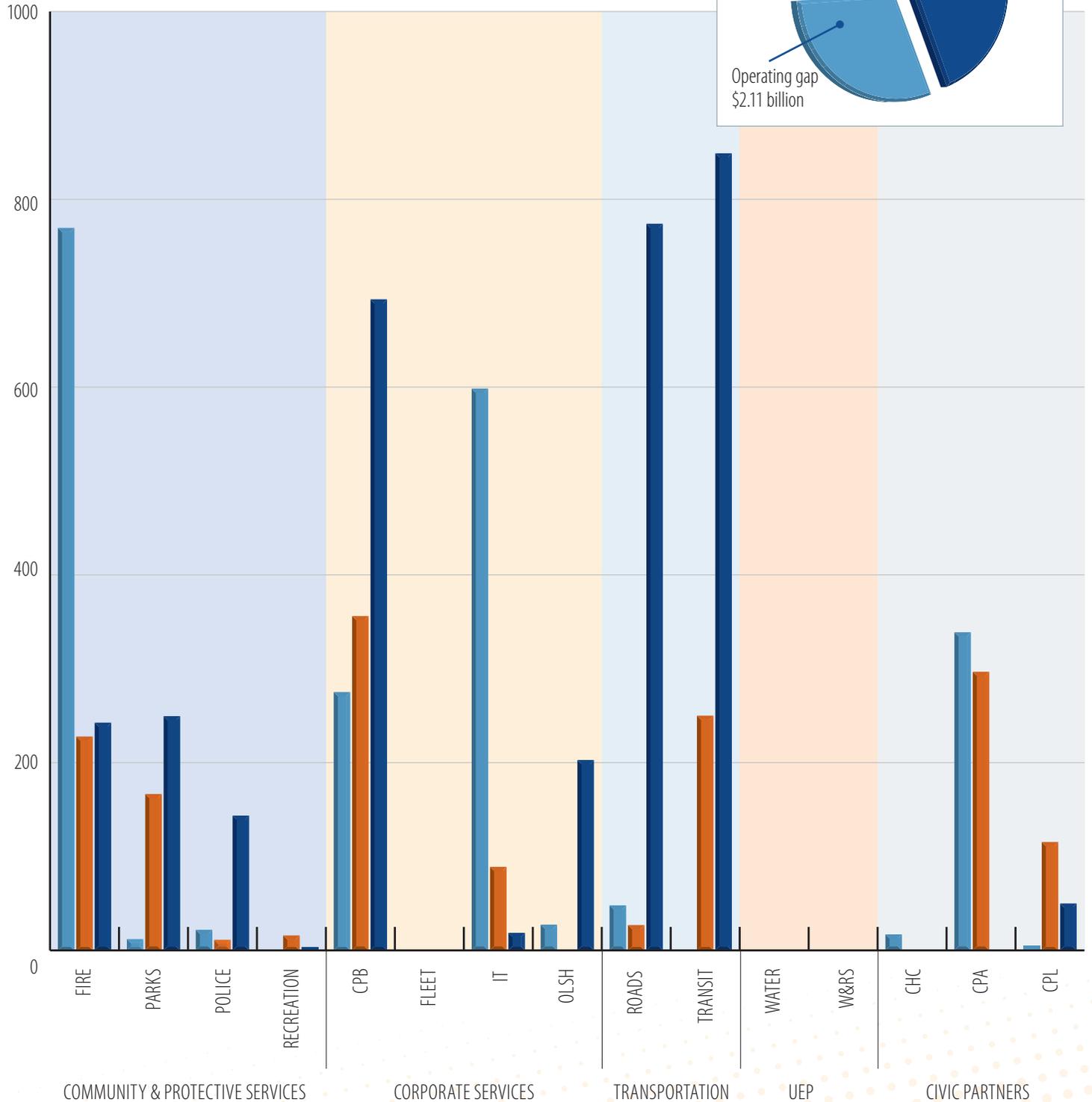
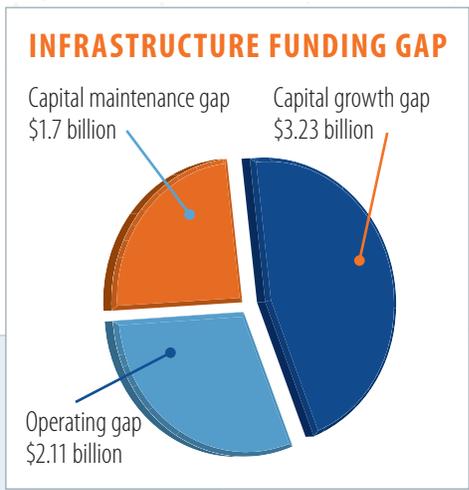
Remaining average asset life by business unit (years)*



* Negative values indicate assets being used beyond their expected life.

Appendix #5

Infrastructure funding gap by business unit (\$millions)



Appendix #6

Business unit (BU) and civic partner narratives

The following provides an overview of the services, standards, infrastructure and management strategies for the individual participating business units and civic partners.

Community Services & Protective Services

Calgary Fire Department (CFD)

The Calgary Fire Department (CFD) requires reliable, safe, functional infrastructure that supports the work of front-line emergency responders and protects citizens. In 2012, 1,400 fire personnel responded to almost 53,000 incidents, made over 115,000 non-emergency public contacts reaching one in 10 Calgarians with safety and prevention messages, and provided essential training and support to front-line emergency personnel.

CFD uses a variety of specialized assets to meet its operational demands for emergency services. In the face of uncertain economic times, increased density in existing communities and expansive suburban growth, the department is under extraordinary pressures to maintain and optimize the lifecycle of its assets. To provide an effective fire service, Asset Procurement and Maintenance must find an effective balance between service delivery, sustainability, and cost-effectiveness.

Key issues and challenges

Key infrastructure challenges for CFD include:

- Sustaining quality fire services and mitigating service gaps through effective use of resources.
- Acquiring budget approval to address the operating impacts of capital and growth.
- Developing funding methodologies to support long-term sustainability of assets and maintain existing levels of service.

Funded capital priorities (2013–2015)

CFD's capital budget includes funding for fire stations in growing areas of Calgary, expansion of two fire houses into fully functional fire stations, replacement of critical fire apparatus, as well as funding for some equipment and facility lifecycle maintenance and replacements. Over the next three years, fire stations will be opened or expanded in growth areas of the city including:

- Symons Valley Emergency Response Station
- Evergreen Permanent Emergency Response Station
- Seton Emergency Response Station.
- Royal Vista Permanent Emergency Response Station
- NE Industrial Emergency Response Station
- East Macleod Emergency Response Station

Unfunded capital priorities

Some of CFD's major capital priorities are not currently funded. With additional capital funding, CFD would address its highest priority unfunded capital projects:

- Station # 7 Replacement
- East Core Emergency Response Station
- Station #17 Replacement
- Critical Technology Upgrades

Managing growth in new and established communities

Several additional unfunded stations are required to improve fire response times in existing suburban areas and protect increasing populations downtown and in the Beltline community.

As Calgary grows, CFD will work with other City departments to develop a long-term strategy and funding projections to ensure new communities are adequately protected.

CFD Services

- Emergency protection and response.
- Emergency and disaster preparedness.
- Prevention of burn, fire and injury programs.
- Fire inspections and investigations.
- Community blood pressure and cholesterol program.

Assets include:¹

Buildings

- 38 active emergency response stations (including multi-service and leased facilities)
- Emergency Operations Centre
- Fire Inspectors Building
- Fire Headquarters
- Apparatus & Equipment Maintenance Facility
- Wellness Centre
- Fire Training Academy

Machinery and equipment

- 100 heavy apparatus (pumpers, tankers/ladders and emergency response units).
- 103 light duty vehicles (including trucks, boats and trailers).
- 24,000 pieces of fire equipment including life safety and personal protective equipment.

¹ As of December 2012

Parks

Parks is the steward of open space in Calgary and provides a diverse range of services to Calgarians and visitors. This broad spectrum of services includes planning and development, education, and front line management of all assets that contribute to the enhancement of those spaces. Parks' mission includes protecting the value and quality of open space for the enjoyment of Calgarians. There are a variety of sites within the municipality, including everything from environmentally sensitive reserves and cultural landscapes, to family and sports sites and the highly urban plazas of the downtown core. Due to the complexity of different park types, a vast amount of data is needed for both living and non-living assets. Parks manages its assets for the long-term sustainability and enjoyment by the public.

The following is an overview of the assets Parks manages.

Land

Five thousand plus parcels of land acquired or donated for the purpose of conservation or the development of Parks space.

Land improvements

All improvements of a permanent nature to Parks land such as, but not limited to, 1,200 plus playgrounds, 700 plus kilometres of pathways, 7,500 plus hectares of landscaping and various park amenities.

Buildings

Permanent or portable buildings such as offices, washrooms, restaurants, garages and warehouses intended to shelter persons and/or goods, machinery, equipment and work space.

Machinery and equipment

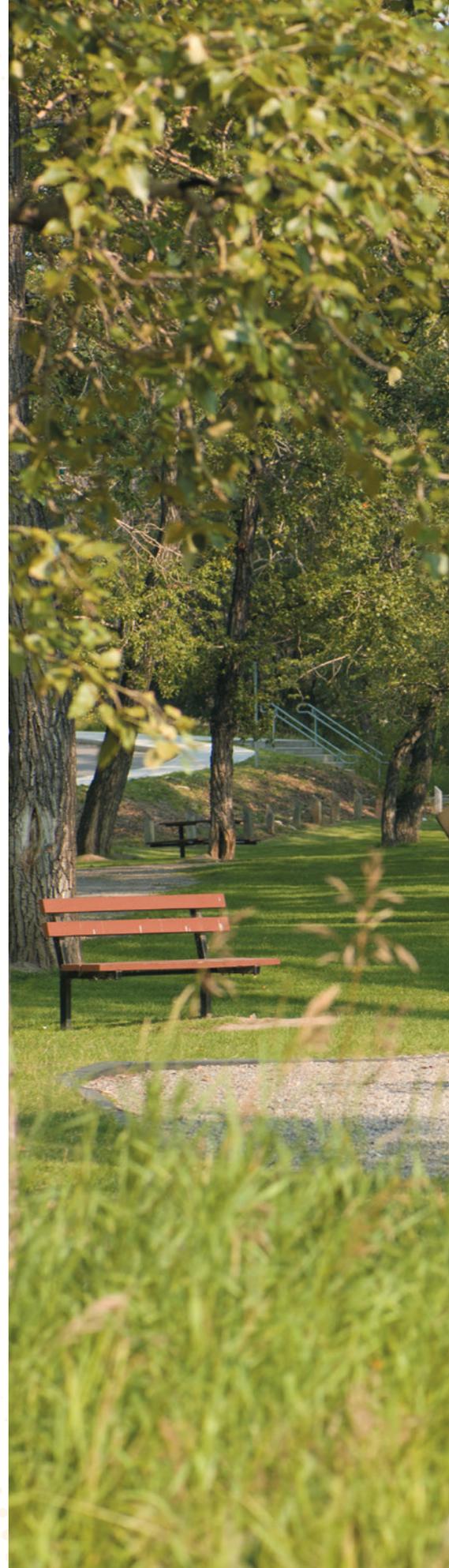
Vehicle trailers, hand held GPS units and smaller equipment in buildings and offices such as furnishings and computer hardware.

Historically, Parks implemented physical condition assessment on critical assets such as pathways and playground equipment; however, within the last three years, the asset condition rating inspection has matured to include all assets. With this improved data collection process and analyzing data/reports from the Parks Asset Reporting & Information System (PARIS), Parks will have updated information to establish capital and operational lifecycle funding requests.

Parks has created an asset management strategy that incorporates both asset assessments and a Customer Level of Service (CLOS) matrix that defines how those assets contribute to the park experience.

Some key infrastructure challenges for The City of Calgary Parks are:

- Sustaining asset growth from new development.
- Replacing/refurbishing aging infrastructure.
- Quantifying customer level of service for the different assets.
- Developing and implementing performance measures that tie into CLOS and the 2040 visionary plan Imagine Parks.
- Sustaining a standardized data capture process for PARIS.
- Utilizing asset data to develop infrastructure and financial forecasts.
- Developing dashboards to compare performance from year to year.



Recreation

Recreation's mandate is to enhance the quality of life for Calgarians by planning for and enabling accessible recreation, cultural and leisure opportunities in the community to promote personal growth and well-being. The following is an overview of the services Recreation provides.

- Develop public facilities such as recreation centres, golf courses, pools, fitness centres, arenas and athletic parks, and public art and culture facilities.
- Direct the operation of recreation facilities.
- Provide recreational, art, cultural and sport programs.
- Provide support for not-for-profit recreation organizations

- Provide liaison and support with partner groups who offer an array of public services such as art, culture, sport, recreation, business and economic development, and attractions.
- Provide consulting services to community groups and organizations who offer leisure services.

Recreation manages the following assets:

- 15 ice arenas.
- Two multi-use leisure centres.
- Two arts centres.
- Glenmore Reservoir facility, including a sailing school and boat patrol site.
- 12 indoor pools.
- Nine outdoor pools.
- 11 athletic parks and the associated buildings.

- Eight golf courses (at six locations) and the associated buildings.

Although Recreation manages the relationship between culture civic partners, sport civic partners, numerous community partners and The City, the numbers reported by Recreation do not include civic partner assets. Additionally, the Subway Soccer Centre is not reflected in Recreation's report as the value is currently being determined. The numbers provided in this report are founded on Recreation's Tangible Capital Asset (TCA) information as housed in PeopleSoft Asset Management. In order to report the replacement costs of Recreation's assets, the depreciated values were escalated to 2012 replacement costs by the Infrastructure & Information Services business unit.



The funded portions of Recreation's reports are only estimates based on the 2012 budget and inflated at a rate of three per cent per year as future funding is based on Council approvals.

Recreation currently performs an annual life-cycle inspection of each building in their stewardship. Recreation applies a systematic approach to identifying the highest priority projects through the Culture, Parks, and Recreation Infrastructure Investment Plan (CPRiIP). This report is updated yearly and identifies issues such as renovations, upgrades, new facilities, and increased lifecycle funding to improve buildings in poor condition.

Maintenance and lifecycle upgrades for existing infrastructure continue to be the highest priority projects for Recreation. Since 2007, many projects have been funded through this process, including repairs and upgrades to existing infrastructure to meet Calgarians' expectations of service.

The budget increases required have largely been directed toward addressing a backlog of infrastructure needs that has accumulated over low infrastructure building periods in the past. Further exacerbating this infrastructure deficit was the latest boom and associated population growth in Calgary. This has greatly increased demands on the services that Recreation provides. The timing of the last extensive infrastructure builds also means that

lifecycle issues are becoming increasingly important as facility ages approach forty years plus. Growth projects also imply an additional lifecycle commitment that must be met in the future to maintain service levels. Stable sources of predictable capital funding are needed to address lifecycle needs.

In addition to the list of projects on CPRiIP, a comprehensive annual lifecycle program is in place for all of Recreation's buildings. Even though there was an increase in funding for 2007 through 2011, base funding levels do not meet the needs of the business unit. Lifecycle resources, therefore, need to be distributed on a priority basis. This has resulted in customers noticing a decrease in the physical condition and functionality of the facilities. Should these buildings not be properly maintained, there will be impacts to current service levels.

Some of the challenges facing Recreation are:

- An aging infrastructure that requires more resources to maintain current levels of service.
- Aging mechanical systems that are inefficient and that are not necessarily environmentally friendly.
- Several facilities are moving past their useful lifecycle and require redevelopment.
- Lack of new facilities in growth sectors of the city.

- An increase in customer demands and expectations.
- Changing legislations and regulations regarding building operations (i.e., Safety and Enviro systems).
- Available land opportunities for new facilities.
- Service maintenance contract fees escalating beyond inflation.

The following list shows some of the mitigating strategies Recreation will implement to address these challenges:

- Prioritized funding requirements submitted through the CPRiIP.
- The Facility Management Framework Project.
- Increased funding from Council for Recreation lifecycle.
- The possible conversion of facilities for alternative uses.
- A comprehensive annual lifecycle plan for Recreation.
- Modernization of facilities and new asset management software to allow for better monitoring and forecasting of high priority projects.
- Possible closure or repurposing of some facilities.

Corporate Services

Corporate Properties & Buildings (CPB)

Corporate Properties & Buildings (CPB) provides land, Corporate accommodation and property management services to enable business units to deliver quality frontline services to citizens of Calgary. The business unit totals approximately 200 employees and delivers five lines of service:

1. Asset Management
2. Corporate Accommodation
3. Facility Design and Construction
4. Facility Management
5. Real Estate Services

Corporate Properties & Buildings applies sustainability principles to land and facilities management. These principles inform decision-making, design, procurement and asset management. CPB co-ordinates City service needs to achieve the best possible outcome when

planning, providing and maintaining land, buildings, offices and work depots for The Corporation. CPB's objective is to support other business units' service delivery and lower future operating costs, and minimize They City's impact on the environment.

The CPB asset portfolio is comprised of (approximately):

- 4.5 million square feet of building space with an estimated current replacement value of \$797 million.* The portfolio excludes recreation centres, fire, police and Calgary Transit buildings.
- Land valued at approximately \$2.2 billion, according to Tangible Capital Assets reporting.
- Land improvements, furniture and equipment valued at approximately \$32 million.

The primary focus within the Corporate Properties & Buildings' portfolio from a *lifecycle maintenance perspective* is on buildings. The expected life for buildings in the portfolio is 50 years with an estimated 12.2 years remaining based on the weighted average (multiplying the buildings remaining life by the buildings replacement value divided by the total replacement value of the portfolio. Weighted years remaining for each building summed to determine the average years remaining for the whole portfolio).

CPB's asset base continues to age, and without sufficient capital life-cycle maintenance investment, there will be a serious risk to sustainable levels of service delivery to customers and ultimately service delivery interruptions to citizens. In response to the overall maturation and deterioration of The Corporate

* Current replacement value is the cost to replace all components of a building in its existing state – soft costs such as design, project management, engineering, tenant fit-up and furniture, and improvements to bring the building to current standards are NOT included; the current replacement value is not generally equal to market replacement value.



accommodation portfolio, the business unit is developing funding models for an ongoing, predictable, sustainable capital Lifecycle Maintenance Program for the portfolio. These funding options will be further explored, analyzed and submitted to Council for consideration and will support future funding requests.

Industry standard facility condition assessments have been completed on the majority of CPB's building portfolio in the past and were updated in 2013. As of the end of 2012, data indicates 10 per cent of the buildings in the portfolio are considered to be in good to very good condition; 24 per cent are considered to be in fair condition and 66 per cent are considered to be in poor to critical conditions.

Data from condition assessments indicates that if we do not invest in the building portfolio, by 2025 the rehabilitation of buildings will be equal to the cost to replace them. As property managers, CPB must decide between elimination of a number of buildings through demolition or sale or investment in rehabilitation which will restore the buildings to a satisfactory condition and increase their lifespan substantially.

The average condition of CPB's 10 key Corporate Accommodation buildings which provide the backbone for service delivery are poor, verging on critical. Without required administrative and operational sites and buildings, service delivery by The Corporation is not possible.

CPB has reviewed buildings in the Corporate Accommodation portfolio on an individual basis. Due to refined analysis, target conditions adjustments and the development of individual building asset management plans, the estimated cost from 2015 – 2024 to bring building conditions up to target conditions has been reduced from \$50.6 million per year to \$45 million per year. Levels of service are being developed leveraging Business Unit Profiles (customer needs identification) performed in 2012.

Using a risk-based approach, internal building operating experts, asset planners and accommodation planners will determine which buildings CPB needs to keep and maintain in operating condition and which CPB can allow to deteriorate towards demolition. Further, an asset risk framework being developed corporately under the leadership of Infrastructure and Information Services will provide a method of risk-based project prioritization, which will incorporate several variables, such as service delivery, physical condition, demand and asset criticality.

The risk-based model will contain details of the changes in both the asset risk profile and the level of risk the customer will be exposed to as a result of the level of funding obtained. This analysis will result in a more accurate picture of capital life-cycle maintenance funding requirements and position CPB as an industry leader in asset management of public property.

Fleet Services

Fleet Services supplies vehicles and equipment on a lease basis to various City business units, helping them to deliver important services to the constituents of The City of Calgary.

Fleet provides full lifecycle management for approximately 3,100 Fleet owned units. Services include budgeting of replacement and growth units, purchase and commissioning them into service. These activities are funded from self-supported debt. All of Fleet's current assets are in good condition.

Fleet also provides preventative maintenance, repairs, fabrication, welding and body shop services for all Fleet owned and non-owned units, as well as operator training.

Fleet maintains its assets in accordance with the following regulatory requirements:

- *Traffic Safety Act* (Provincial)
- *Occupational Health and Safety Act* (Provincial)
- National Safety Code (Federal)
- Canadian Motor Vehicle Safety Standards (Transport Canada)

An asset management strategy for replacement and growth requirements over the next 10 years includes:

- To maximize the use of the asset during its lifecycle, Fleet will provide optimum preventative maintenance in compliance with manufacturer recommendations. Intervals of preventative maintenance and repair activities are optimized to provide maximum up-time for client operations.
- Growth is planned based on clients' needs and their operational budgetary constraints.

Fleet is investing in upgrades and new system developments to support its asset management practices and decision support.

Information Technology (IT)

The services which Information Technology provides include:

- Technology architecture, infrastructure governance and security to ensure the privacy and confidentiality of customer and Corporate information.
- Partnership and collaboration with business units to provide effective systems solutions and hosting services.
- Information management to ensure the integrity of access, use and storage of customer and Corporate data.
- Management of Corporate technology life-cycle planning and portfolio management.
- Guidance to business units on change management and business process management.
- Leadership on web innovation and emerging technologies to address growing demands within a changing environment.

Information Technology owns and operates a pool of assets with a replacement value of \$243 million (reported October 2010, 2009 cost base). These assets have been divided into five groups.

Infrastructure

Includes data centre mechanical/control, systems. HVAC, electrical, special facilities (dash board systems), fire protection systems, architectural (raised floor), communication network – conduit, pull boxes, fibre optic cables, fibre optic network, towers, wiring, servers, storage.

Office/boardroom equipment

Includes laptop, monitor, other, personal computers, printer, projector, smart board, print shop, cameras, phones, wide format plotters, audio visuals.

Mobile (Telecoms)

Includes mobile equipment, phones, radio systems.

Software

Includes business systems, interfaces, Enterprise Application Integration software, web software, desktop productivity software.

Furniture

Includes IT furniture.

Asset valuations are taken directly from the Corporate Asset Management System (PSAM). Condition ratings are based on straight line deterioration. Most technology asset types do not display visible physical deterioration over time, but the physical, demand or functional condition decrease over time. Condition ratings were not available for all assets for reporting in this report.

Understanding the physical, functional and demand condition of high value assets (i.e., infrastructure and software) where relevant depreciation information can be used to inform longer term asset life-cycle planning. Currently, IT is also working on the implementation of ITIL v3.0, which includes a service catalogue component that will assist in defining Levels of Service (LOS). Further asset performance measures may be developed in the future under asset LOS.

It is expected that future customer demands will be for increased LOS. Information Technology has plans in the future to define their customer LOS and link this LOS to costs of service provision. Defining customer LOS demand and associated costs will assist IT in communicating costs of changing LOS in the future. IT has identified the need to change service delivery methods to meet rapidly increasing LOS demands and has several ongoing initiatives to address this need.

Traditionally, individual asset data stewards have been responsible for developing and implementing asset management practices for their asset group. Information Technology has identified the need to develop standardized asset management practices and has dedicated human resources to an IT Asset Management group to lead the process. These processes will focus initially on infrastructure assets, with the ultimate goal of extending to all asset groups. High priority areas for developing processes for filling information gaps are:

- Develop and implement a process for maintaining updated asset information (i.e., condition ratings).
- Develop and implement a TCA sustainment process.
- Map asset management processes and communicate map with staff involved in AM.
- Define current and target customer Levels of Service.



The Office of Land Servicing & Housing (OLSH)

The Office of Land Servicing & Housing (OLSH) manages affordable housing assets and develops City-owned land into industrial and business parks for sale, along with intensified development around transit hubs. It also manages the sale and marketing of City-owned real estate. Through Calhome Properties Ltd., a wholly-owned corporation that operates as Calgary Housing Company (CHC), which provides property management of approximately 7,000 affordable housing units and administers a Provincial Rent Subsidy Program that provides affordable housing in 3,000 private sector units. 2,205 of the 7,000 units are owned by The City in City-owned and Partnership Portfolios and are reported in the OLSH asset register in this report.

The City of Calgary's City-owned Portfolio (CHP) represents 1,120 affordable housing units constructed between 1968 and 1972. This portfolio is comprised of older building stock that is in fair to good condition. An operating agreement for maintenance of building structures and systems exists (Federal – 50 per cent, Provincial – 40 per cent, and The City of Calgary through the OLSH budget – 10 per cent).

The 2013 OLSH operating budget includes the municipal 10 per cent allocation as \$674,600 of the total \$6,746,000 for annual maintenance and operating expenses. These operating agreements specify rent maximums, based on household income, and equate to approximately 30 per cent of

actual market rents. These operating agreements expire between 2020 and 2023, which represents a very high risk to The Corporation as The City of Calgary will then become responsible for the entire operations and maintenance deficit for these assets. To either extend the life of these assets or replace them would require \$10,063,000 as a high level estimate for capital maintenance over the next 10 years. There is currently no capital maintenance reserve in place for this portfolio. There is a degree of urgency to convert, retire or replace the 1,120 units with units that follow a more sustainable funding model similar to the mixed market model that is employed in the Partnership Portfolio described below.

The City of Calgary's Partnership Portfolio represents 1,085 affordable housing units that vary in age from 1968 to 2013 and are operated on a mixed market funding model. This model is the preferred model for delivering affordable housing going forward, and is based on one-third of the tenants paying market or near market rent, which offsets the two-thirds of tenants paying subsidized rent (one-third of tenants at moderate subsidy, and one-third at deep subsidy). In this portfolio, The City is 100 per cent responsible for the maintenance costs through a self-funded model based on rental income. There are no on-going operating subsidies received from other levels of government for this portfolio.

Most of the units in this portfolio are either new construction or have had extensive renovations and are considered

to be in good condition. From 2011 through 2013, there were four new affordable housing projects constructed in this portfolio:

Lomond	
15 units	Occupied April 2011
Luxe/Vida	
45 units	Occupied May 2012
Bridgeland/Mcpherson Place	
58 units	Occupied July 2013
Manchester/Lumino	
88 units	Occupied Q3 2013

The capital grants provided to acquire these units contain maximum rent restrictions under a 20-year long-term agreement, which limits revenue opportunities. A limited reserve has been established for this portfolio following CMHC guidelines. The annual maximum contribution is \$500/unit and lifetime maximum contribution is \$5,000 per unit. As of year-end 2012 this maintenance reserve has reached approximately \$4.1 million, and will continue to grow to match the number of units.

In addition to these portfolios, CHC owns and manages an additional 1,772 affordable housing units. The properties are managed under the terms and conditions of property operating agreements that set out funding models and replacement reserve fund guidelines. 210 of the units receive operating deficit funding of 70 per cent from the federal government and 30 per cent from the province of Alberta. Capital and operating expenses for the remaining units are self-funded.



The portfolio is comprised of properties constructed between 1960 and 1994.

- 19 per cent from 1960 to 1979
- 73 per cent from 1980 to 1984
- Eight per cent from 1990 to 1994

The types of properties are:

- 59 per cent townhouses
- 13 per cent high rise apartments
- 17 per cent walk-up apartments
- 11 per cent duplexes and triplexes

In 2011, CHC began work on a detailed Building Condition Assessment of all of the housing units, to provide accurate and detailed reporting on the capital work requirements for these assets. As of Q2 2013 CHC has completed comprehensive Building Condition assessments on 11 of the 74 CHC owned, City-owned or City partnership sites. These condition assessments will provide the data to incorporate into a long-term asset management plan. The results of the asset management portfolio assessment process drive the capital maintenance forecast over the lifecycle of the properties. The program considers the needs of our tenants and developing design and construction trends to determine the potential for the redevelopment of existing properties and the development of new housing opportunities.

For the 2012 – 2014 budget cycle, Council directed OLSH to build 88 affordable housing units per year, with an estimated cost of \$260,000 per unit including land costs. In 2013 the OLSH Affordable Housing Division worked on three new affordable housing projects:

- Parkdale 25 units
- Kingsland 45 units
- Crescent Heights 27 units

Transportation

Roads

Roads is one of four business units in the Transportation department, the others being Transit, Transportation Planning, and Transportation Infrastructure. Roads is responsible for operating, maintaining and renewing The City of Calgary's road system in a safe and sustainable manner, in order to enable the movement of people and goods.

Roads is also impacted by the construction work done by other parties. The Transportation Infrastructure (TI) business unit delivers major projects like the addition of new interchanges and

major roadway upgrade, while private developers build roadway infrastructure in new subdivisions. Roads inherits the ongoing operation, maintenance, and renewal of these works.

Operational activities include snow and ice control and Spring Clean Up; street use and permitting; design and operation of electronic traffic control devices; traffic monitoring and control, including detours for roadway construction and special events; the production and sale of signs and construction materials; and pavement marking.

Maintenance and renewal activities include condition inspection, repair, replacement or rehabilitation, and minor upgrades in order to preserve and improve the safety and reliability of the road network. Roads also provides review, inspection, and acceptance services for infrastructure constructed by developers and third-party contractors.

As of the end of 2012, the total replacement cost of all assets under Roads stewardship is estimated to be just over \$12.9 billion. The Roads portfolio is described in the table below.

ASSET TYPE	QUANTITY	UNIT OF MEASURE	CURRENT REPLACEMENT COST (\$MILLION)	AVERAGE PHYSICAL CONDITION
Boulevards	1,020	Hectares	\$127.4	Fair
Bridges and tunnels	392	Count	\$1,629.5	Good
Curbs and gutters	6,312.7	Linear kilometres	\$1,388.0	Excellent
Fences	439.5	Linear kilometres	\$58.3	Fair
Guide signs	280	Count	\$35.0	Good
Land and facilities		Various	\$371.6	Fair
Lanes	10,810.5	Linear kilometres	\$251.0	Poor
Machinery and equipment	4,098	Count	\$10.9	Fair
Pathways	127.0	Linear kilometres	\$17.5	Poor
Pavement	14,903.9	Lane kilometres	\$5,698.0	Good
Plants	2	Count	\$20.8	Good
Retaining structures >1 metre	88.7	Linear kilometres	\$90.3	Not assessed
Retaining walls ≤ 1 metre	13.3	Linear kilometres	\$10.5	Poor
Sidewalks	5,316.7	Linear kilometres	\$1,461.6	Excellent
Sign Shop equipment	19	Count	\$0.5	Not assessed
Signs	91,991	Sign posts	\$20.6	Excellent
	20,157	Regulatory signs		
	130,200	Other signs		
Street furniture	2,360	Count	\$7.1	Excellent
Streetlights	81,047	Number of light fixtures	\$1,514.2	Fair
	7,080.50	Kilometres of electrical wire		
Timber stairways	67	Count	\$1.8	Good
TMC	1	Count	\$7.2	Good
Traffic barriers	58.6	Linear kilometres	\$36.3	Poor
Traffic signals	954	Signalized intersections	\$151.1	Good
TOTAL (\$MILLION)			\$12,909.3	



The management of roadways is governed by the following legislation:

- *Municipal Government Act* (2013)
- *City Transportation Act* (2008)
- *Traffic Safety Act* (2013)
- *Public Highways Development Act* (2010)
- *Highways Development and Protection Act* (2010)

These do not articulate the standards for roadway construction, operation and maintenance, but do set out the guidelines by which highway authorities must operate. Roads has developed internal design and construction standards, and maintenance and operation procedures based, where appropriate, on industry best practice guides.

City of Calgary policies that impact the provision of roadway services include:

- TP001 Dangerous Goods Route Network Development Policy
- TP002 Traffic Calming Policy
- TP003 Surface Transportation Noise Policy
- TP004 Snow and Ice Control Policy
- TP005 Truck Route Network Development Policy
- TP006 High Load Truck Route Network Development Policy
- TP007 Installation of 'Out of Sequence' Traffic Signals Policy
- TP008 Streetlight Standards and Sign Poles – Colour of Paint Policy
- TP009 Environmental Capacity Guidelines for Roadways Policy
- TP010 Pedestrian Policy
- TP011 Bicycle Policy
- TP012 Calgary Transportation Plan
- TP013 Roadside Memorials Policy
- TP014 Parking Governance Roles and Responsibilities
- TP015 Calgary Parking Authority Financial Returns to The City
- TP016 Roundabout Policy
- TP017 Parking Policy Framework for Calgary
- TP018 Residential Street Design Policy

Roads performs regular and formal condition surveys for approximately 84 per cent of its asset base. The assets that are not formally assessed are primarily either supporting operational activities or replaced as failure occurs. Service levels are determined largely based on roadway classification, with high volume roads receiving increased inspection and maintenance, and being constructed to more robust specifications.

Roads services are primarily funded as follows:

Tax support	71 per cent
Internal recoveries	20 per cent
User fees/other sales	7 per cent
Other	3 per cent

However, as mentioned above, Roads services are also impacted by the funding available for major capital projects delivered by TI. Funding for these projects is expected to drop significantly starting in 2013, as several federal and provincial funding programs are ending. The Calgary Transportation projects that have been deferred as a result of this funding reduction are focused primarily on improving goods movement and accommodating traffic growth.

The deferral of these projects, along with Calgary's continued and rapid growth, is expected to generate additional traffic that will increase both congestion for roadway users and also the deterioration rate of existing roadway assets. As with many of Calgary's business units, Roads faces the challenge of maintaining current service levels while usage increases and capital funding decreases.

Roads is committed to facing this challenge in a number of ways. A couple of examples include the implementation of solutions to improve peak traffic flows, such as the lane reversal systems on Centre Street and Memorial Drive; and the use of new technologies and tools that can increase staff efficiencies and reduce asset lifecycle costs.

Calgary Transit

Calgary Transit's mission statement is "To provide safe, accessible and courteous public transportation in response to the needs of our customers."

To be able to deliver the mission statement Transit must:

- Keep a well maintained asset base and fleet of vehicles that are clean, safe and reliable.
- Provide services using community shuttle buses, regular buses, bus rapid transit and light rail vehicles.
- Provide specialized transportation for disabled persons through Access Calgary.

The regulatory standards that have the largest impact on the management of Transits assets are:

- Air quality regulations set out by the Alberta government.
- Vehicle weight restrictions as mandated by Alberta Transportation.
- Fuel storage regulations as outlined by the Petroleum Tank Management Association of Alberta.
- Alberta Building Code (Alberta Government).
- Alberta Fire Code.
- Access Design Standard 2010 – City of Calgary.

Other guidelines that have an impact on the management of Transit assets, but do not qualify as regulations are:

- American Public Transportation Association (APTA) policies. Transit is a member of APTA and uses their policies as a guideline to define best practices in safety and service delivery.

- National Fire Protection Association 130 – Standard for fixed Guideway transit and passenger rail systems.
- City of Calgary Advisory – Committee on Accessibility working with Access Calgary and the disabled community to deliver the best possible access to public transit that can be provided within budgetary constraints.
- City of Calgary- Environmental Policy

Transit manages its assets in three major categories.

- Facilities (part of the Infrastructure division portfolio).
- Engineered structures (part of the Infrastructure division portfolio).
- Vehicles and equipment (part of the Fleet division portfolio).

Currently, Transit assets include:

Facilities

- Anderson garage and maintenance facility for buses and LRVs.
- Spring Gardens Administration building and maintenance and storage facility for buses.
- Victoria Park Administration building and maintenance and storage facility for buses.
- Oliver Bowen maintenance and storage facility for LRVs.
- Haysboro garage storage facility for LRVs.
- Three utility buildings.
- Canyon Meadows and 69th parkades.
- 44 LRT stations (adding one new station in 2014).
- Two bus shelters.

Engineered structures

- Bridges and roads (maintained by Roads).
- 44 parking lots, comprising 16,978 parking stalls.
- 44 LRT platforms.
- Communications infrastructure (Including closed circuit television cameras, communications rooms, Help phones, PA systems, passenger information systems, radio systems, SCADA (supervisory control and data acquisition systems), train tracking systems, underground infrastructure and voice.
- 48 LRT traction power substations.
- LRT signal systems including wayside ABS, crossing systems, interlocking systems and signal rooms.
- 110 kilometres of track.

Vehicles and equipment

- 814 large buses.
- 132 shuttle buses.
- 193 LRVs.
- 109 light and heavy duty support vehicles.
- Seven trailers.
- 160 ticket vending machines.
- 2,100 fare boxes and other cash processing equipment.

Asset condition

Transit's engineered structures are in fair condition, but the assets are aging and with the increased demand on the system this could affect the availability and condition of the assets and their life span.

The condition of Transit's buildings are in fair condition, but with the growing number of assets that require storage and maintenance there will be an increase in the demand on transit buildings. This in turn could affect the building availability and condition, and the maintenance required to upkeep the facilities.

Transit's fleet is aging, but with the influx of new vehicle purchases, Transit will be able to decrease the amount of older vehicles, which will improve the fleet's overall reliability and condition.

Asset management strategies

The traditional focus for Calgary Transit has been the maintenance of the fleet of vehicles and the infrastructure that supports the LRT and bus system. Going forward, Calgary Transit has identified the need to improve the asset management practices for all infrastructure and standardize asset management practices across all asset types. Calgary Transit has dedicated resources to implement asset management practices for assets that will be developed in the following high priority areas:

- Develop and implement processes for maintaining asset condition (physical, functional, and demand) information for each of the asset groups.
- Develop measures and processes for tracking asset performance for each of the three asset groups.
- Complete development of 20-year Capital Plan and accompanying long-term operational Expenditure Plan.
- Review established preventative maintenance schedules for opportunities to optimize fleet reliability.
- Identify asset management competencies required and address opportunities for development.
- Develop resourcing plan for capital project implementation and long-term asset stewardship.



Utilities & Environmental Protection

Waste & Recycling Services (W&RS)

The funded values for Waste & Recycling Services (W&RS) are based on the approved 2012 – 2014 Budget, including annual budget adjustments, and the 10-year Capital Spending Plan submitted at that time. No funding gap was identified in the plan. W&RS does not currently have an unfunded project list. At this time, several potential future infrastructure projects such as a Waste to Energy Facility and an Anaerobic Digestion Facility that may be required to meet/achieve the 80/20 by 2020 Waste Diversion goal are not included in the plan. These initiatives have yet to be approved by Council and W&RS will be exploring alternative funding strategies such as private ownership.

The capital program at W&RS is self-funded through the Capital Revenue/ Reserve, the Gas Tax Fund grant and self-supported debt. The capital program is not supported by property tax. A small amount of pay-as-you-go (PAYG) funding is in place for a couple projects, which will be used up in 2013. It is anticipated that W&RS will not receive any more PAYG funding in the future.

W&RS's capital program/budget is currently classified under three capital programs (landfill activities, waste diversion and facilities). Each program is categorized under maintenance, upgrade and new services. The values calculated for the funded capital maintenance were sorted using this categorization.

W&RS is developing an Infrastructure Investment Plan (IIP) for the 2015 – 2018 business cycle. The IIP framework (capital programs and drivers) will align to the Corporate maintenance, upgrades, growth, new service categorization. The projects identified over the next 10 years will be delivered for a number of reasons including maintenance, upgrade, growth, level of service and to ensure regulatory compliance.

The values calculated for W&RS's cost-of-replacement (CRV) do not include land, capped landfill cells and landfill gas infrastructure.

Description of the asset portfolio

W&RS manages several assets that facilitate the delivery of its services, including:

Landfills

- Three active landfills (East Calgary, Spyhill and Shepard) with approximately 55 million cubic metres of solid waste in both lined and unlined landfill cells.
- Five inactive landfills with closure dates between 1940 to 1994.
- Significant areas of undeveloped land at landfill sites.

Landfill infrastructure (land improvements)

- 23 kilometres of landfill leachate collection systems which collect 11,000 cubic metres of leachate per year.
- 13 kilometres of landfill gas collection systems that collect 2.8 million cubic metres of landfill gas annually, which is thermally treated and used to generate electricity.
- 40 kilometres of paved and gravel roads.

Stormwater infrastructure

Shepard Landfill site

Existing assets

- Central Wetland.
- Industrial Area stormwater ponds.

Future assets

- Approved Staged Master Drainage Plan.
- South Stormwater Pond and associated ditch under construction (slated for completion end of 2013).
- East Stormwater Pond serving the Shepard Resource Recovery Campus (set to tender early 2014).

East Calgary Landfill site

Existing assets

- North Stormwater Pond (in service as of Nov. 4, 2011).
- South Stormwater Pond (in service as of Nov. 4, 2011).
- Temporary South Stormwater Pond.

Future assets

- Design of Staged Master Drainage Plan (to commence Q4 2013).

Spyhill Landfill site

Existing assets

- Four stormwater ponds (viz. ponds C, D, E and F).

Future assets

- Upgrade to the existing stormwater drainage system.

Buildings

- Landfill site buildings (includes offices, lunch rooms, locker rooms, laboratory, truck storage, tool storage, truck wash, maintenance shop, parts trailer, alarm trailer, transfer station, scalehouses and landfill gas).
 - 17 buildings at Spyhill Landfill site
 - 13 buildings at East Calgary Landfill site
 - 12 buildings at Shepard Landfill site
- Spring Gardens truck storage (administration area, paint and welding shop) and sprung structure (vehicle and equipment storage).

Collections infrastructure (as of June 2013)

- 300,594 blue recycling carts.
- 307,553 black garbage carts.
- 5,274 commercial collection bins.
- 448 Fleet vehicles (owned by Fleet Services but operated by BU).
- 48 community recycling depots.

Business unit services required

Any regulatory, legislated or other service level requirements

The regulatory standards which currently have the greatest impact on the management of W&RS assets are environmental regulations. An Approval to Operate from Alberta Environment & Sustainable Resource Development (ESRD) is required for landfills. The Standards for Landfills in Alberta and *The Water Act* dictate the processes for managing stormwater, leachate and groundwater.

Greenhouse gas emissions are self-reported using best practice standards to both Alberta ESRD and Environment Canada. The reporting limit for both agencies is 50,000 tonnes carbon dioxide equivalent per site per year. There is also a compliance limit for Alberta ESRD of 100,000 tonnes of carbon dioxide equivalent per site per year. Exceeding this limit may result in financial penalties for W&RS.

In order to decrease emissions, W&RS may purchase offset carbon credits or implement greenhouse gas reductions projects (such as landfill gas collection systems). At this time, no W&RS landfills exceed this threshold. However, implementation of infrastructure solutions to continue maintaining compliance will have an impact on the investment plans and capital budgets.

In the future, there is potential that the compliance limit could be reduced to 50,000 tonnes of carbon equivalent per site per year to match the reporting limit. W&RS is working with the Environmental and Safety Management (ESM) business unit on quantifying/obtaining carbon credits from W&RS's existing landfill gas operations. These credits may in future be used for compliance needs or marketed as a source of funding.

PSAB 3150 is a legislative driver contributing to the robustness of the data used in the development of W&RS's asset management plan (AMP). PSAB 3150 mandates municipalities to report tangible capital assets (TCAs) on their financial statements. Accurate asset information and better understanding of asset life can be obtained by continually updating the W&RS asset registry system, once established. This information will be used to continuously improve the AMP over time.

Description of the asset condition

Waste and Recycling Services' buildings and engineering structures are approaching the middle of their physical life cycle; however, in isolated circumstances there are assets that are not achieving their functional requirement. A condition assessment of buildings on landfill sites was conducted by an external consultant and a report submitted to W&RS in June 2011. W&RS has developed a building maintenance program to maintain and extend the lifecycle of new and existing support infrastructure. W&RS has also developed a strategic risk management framework and is in the process of developing an asset risk management framework for renewing, replacing or extending the life of assets. Generally, Waste & Recycling Services' equipment is in good physical condition and demand for it is well understood.

Asset management strategies

A description of asset management strategies (maintenance and growth) being implemented over the next 10 years.

There have been significant efforts by Waste & Recycling Services to plan and design infrastructure that supports the core levels of service. W&RS has identified the need for improved management of its assets and is currently developing and implementing asset management

processes which will support efficient and broader customer service delivery in the long-term. Recent and ongoing reorganization of the BU has been partially driven by the need to improve asset management capacity.

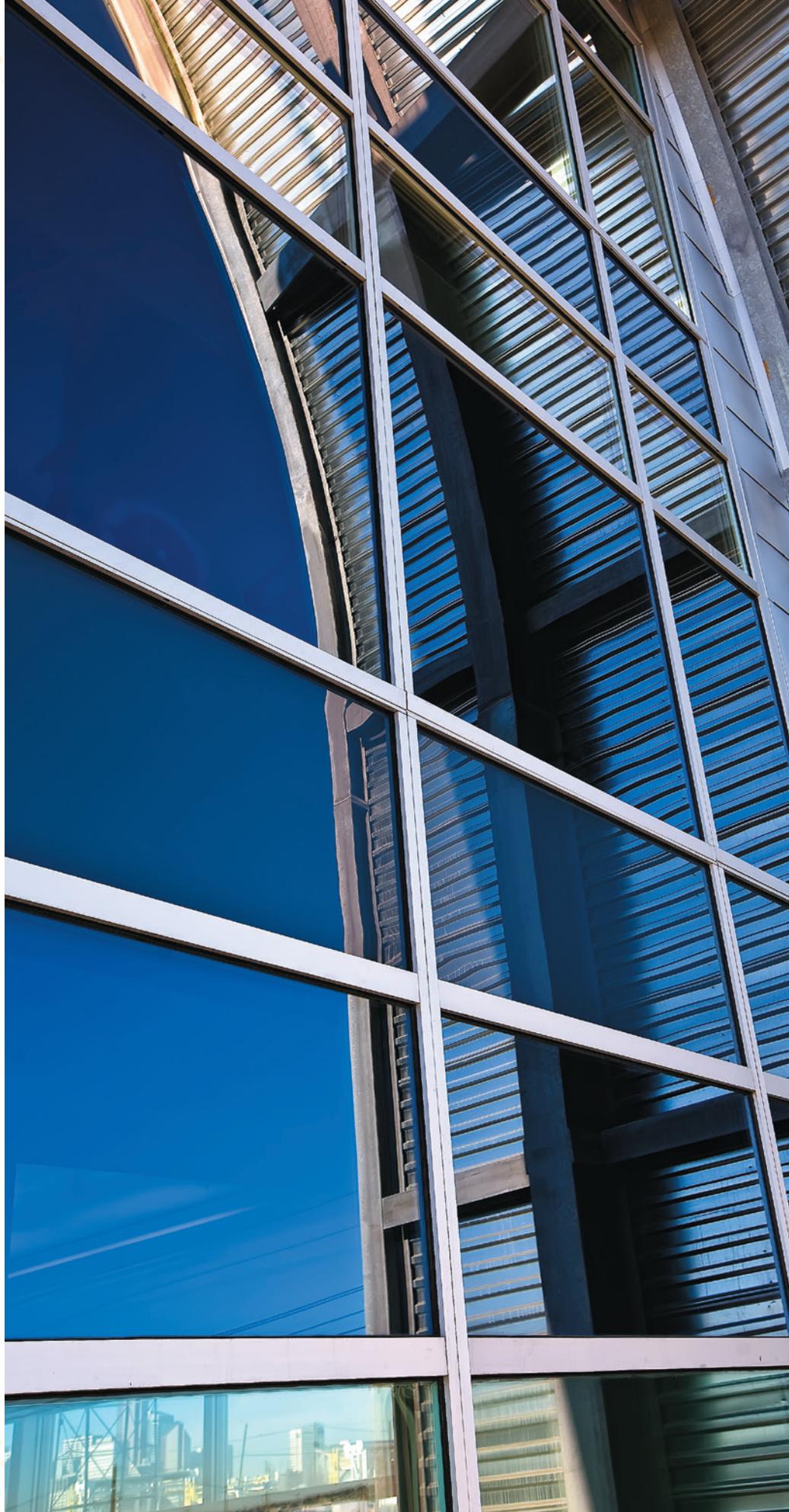
The main objective of asset management for W&RS is to build capacity and understanding across the business to align and improve decision-making and program delivery. W&RS has developed a building maintenance program to maintain and extend the lifecycle of new and existing support infrastructure. W&RS has also developed a strategic risk management framework and is in the process of developing an asset risk management framework for renewing, replacing or extending the life of assets. This will facilitate efficient service provision as the business of resource recovery evolves and will assist in communicating costs with Council and citizens.

An Infrastructure Investment Plan (IIP) that includes a 10-year Capital Plan is being developed and will provide a list of prioritized projects to be delivered in the next business cycle. W&RS has completed a preliminary business process review, needs assessment and system investigation to identify a best-suited computerized work management system. The business case has been completed and W&RS is currently pursuing the Corporate Technology Committee approval to commence the next phase, which would involve system selection and implementation. As new systems are implemented, new business processes and operational resources will be required to ensure that these systems are maintained and updated.

The identified asset management objectives are long-term objectives which will be achieved through continuous improvement in asset

management practices. Some specific strategies which are currently being implemented include:

- Developing and implementing the W&RS Asset Management Plan (AMP) in accordance with Corporate AMP framework.
- Maintaining and updating the AMP to incorporate process and data improvements.
- Developing a prioritized Infrastructure Investment Plan.
- Reviewing W&RS's financial policies and funding models.
- Developing a resourcing plan to initiate and manage the delivery of capital and operating projects/programs.
- Conducting condition assessments for assets and developing asset risk frameworks to prioritize investments.
- Identifying and implementing cost-effective asset maintenance programs to reduce or mitigate risk of failure to achieve desired levels of service.
- Linking operational requirements to capital expenditures in current and future budget cycles to ensure that operational implications of capital projects are considered when the capital expenditure is approved.
- Formulating and implementing asset replacement programs where asset maintenance programs prove too costly or are unable to sustain service levels. This analysis will be an output from the asset condition assessments and development of the asset risk framework.
- Identifying, implementing and improving asset management information systems to provide accurate and timely information for effective asset management, asset planning and performance monitoring.



Water Resources and Water Services

Background

Water is a part of Utilities & Environmental Protection (UEP). The department mission is to "...work with the community and Corporation to conserve, protect and enhance air, land and water for present and future generations." The Water business units (Water Resources and Water Services) contribute to this mission by helping to protect our watersheds, providing world class water and wastewater treatment, and conserving our water resources for future generations while supporting Calgary's growth.

Asset portfolio

Water infrastructure includes two water treatment plants, and a distribution network of reservoirs, water pump stations, pipes and service connections to deliver safe drinking water to customers. Water also operates the Glenmore Dam, which stores raw water in the Glenmore Reservoir.

Our wastewater infrastructure includes three wastewater treatment plants, a network of lift stations, sanitary pipes and services to collect and treat wastewater.

The drainage system includes stormwater pipes, wet ponds, dry ponds, wetlands and lift stations.

Asset condition

The majority of assets in Water range in physical condition from fair to excellent. A few exceptions exist for each category. These components have been identified for maintenance, upgrades or replacement in the future. The water, wastewater and drainage infrastructure is able to meet the current demand requirements of The City of Calgary; however, important infrastructure investments will be required to maintain our customer levels of service and continue to meet increasing service demand and growth.

Water Infrastructure Investment Plan (WIIP) drivers

The Water Infrastructure Investment Plan is a strategic, long-range capital planning document that reflects citizen and community priorities and ensures infrastructure risks and needs are appropriately addressed. The WIIP supports the four year budgeting process.

In order to achieve business objectives and ultimately continue to deliver a sustainable and reliable service to our customers, Water has defined four main drivers within its WIIP. These are:

- Maintain assets.
- Regulatory and environmental protection.
- Service.
- Growth.

Maintain assets

Effective asset management requires continued long-range infrastructure planning.

Water has ongoing condition assessment and maintenance programs, which have helped identify and eliminate potential service failures that could be costly to replace on a reactionary basis. For example, the yearly water main break count has been steadily decreasing as a direct result of such strategies, thereby reducing service disruptions, placing Calgary as one of the best performing municipalities in the country.

The condition assessment and maintenance programs are vital since about seven per cent of our total infrastructure is at or below fair physical condition. This infrastructure is critical to maintaining levels of service to all areas of the city. Asset management strategies and maintenance investments ensure that the utilities continue to provide a high level of service to citizens.

In future years, the utilities will require reinvestments across all three lines of service (water, wastewater and drainage) as assets approach the end of their useful life. Increased investments are required in maintenance and inspection programs to proactively replace assets coming to the end of their asset lifecycle and ensure reliable service and operational efficiency.

Areas of asset and investment management that are being reviewed and improved include:

- Maintenance plans to optimize asset life-cycle costs for all asset classes.
- Prioritized infrastructure investment planning and project portfolio management to ensure investments are directed toward highest business value.
- Condition and risk assessment programs for all asset classes to ensure reinvestments are directed to higher risk assets.
- New and innovative technologies to improve the effectiveness of condition assessment and rehabilitation programs.

Regulatory and environmental protection

The City must comply with regulatory requirements in order to prevent risks to public health and the overall environment, and maintain its approval to operate. This requires reinvestment in our existing infrastructure to maintain compliance and the provision of new infrastructure as more rigorous regulatory requirements are put in place.

The City is dedicated to protecting and managing our precious water resources. Through an integrated approach, the entire watershed must be considered including reducing upstream risks to our water source, reducing Calgary's impacts on the rivers

(Stormwater Management Strategy) and conserving this limited resource through its responsible and efficient use (30-in-30 Water Efficiency Plan). Watershed planning initiatives are aligned to the provincial Water for Life strategy and regional watershed management plans to protect the watershed.

The City's water treatment plants produce safe and reliable drinking water that meets existing regulatory standards, and Drinking Water Safety plans have been prepared to meet the requirement for all water treatment systems in Alberta. The wastewater treatment plants are currently meeting the approval to operate requirements.

Over the next 10-year period, The City will need to respond to more stringent regulatory requirements. Some of the anticipated future regulatory requirements include UV disinfection at the water treatment plants and the tightening of effluent discharge limits from wastewater treatment plants.

Service

Aging infrastructure and increasing demand are challenges that drive the need for continuous investment in order to maintain the highest service levels to citizens. Work continues to identify opportunities to enhance resilience and protect The City's infrastructure and citizens' property. The City has made significant investments in past business cycles to ensure an appropriate level of resilience for key infrastructure, an example of which are the two water treatment plants and the investment in upgrading pre-treatment facilities. The benefits of these upgrades were clear during the flood in June 2013, as The City was able to provide safe drinking water throughout the event.

The Water Infrastructure Investment Plan includes community drainage

improvements, water main replacements and local water quality improvements to ensure the highest levels of service for the city, its citizens and its regional customers.

Growth

The Water Infrastructure Investment Plan includes significant investments to reinforce the existing infrastructure and provide new infrastructure to accommodate growth in both developed and developing areas. Higher than expected growth advances the need for more capacity to accommodate the increased serviced population.

High growth levels will impact capacity at both wastewater and water treatment plants. The Bonnybrook Wastewater Treatment Plant is currently servicing a population that is nearing its installed capacity at a much greater rate than previously anticipated. A capacity upgrade of one of the water or wastewater treatment plants is required on average every 10 years based on the last 20 years of historical growth. As a result, significant but expected investments will be required in water and wastewater treatment to meet the increased population growth projections over the next 10-year horizon.

Water is focused on delivering the best value for money to meet the citizens' current and future water needs, and support stable and predictable rates and service levels. This is only possible through robust asset management plans and practices. Water will continue to provide the best service levels and to ensure appropriate investments are made to extend the life of its aging assets. Water will continue to ensure the right infrastructure investments are made to support growth and comply with current and future regulatory requirements, while protecting and managing our valuable water resources.



Civic partners

The following external entities have been included in the 2013 Infrastructure Status Report to align with the included reporting entities from the 2010 Infrastructure Status Report.

Calgary Parking Authority (CPA)

Overview

The existing mandates of the Calgary Parking Authority (CPA) are set out in the Calgary Parking Authority Bylaw No. 28M2002. The Authority's business services are governed by City policy and by provincial legislation, and are implemented through our Parking Management Program. We fulfill the mandates by planning, developing and operating:

Public parking services: Our public parking facilities help fulfill Council's vision for the overall land use direction of the city and its transportation system. An external consultant report, "Strategic Review of the Policy Foundation, Business Model and Governance of the Calgary Parking Authority" and its recommendations were approved in principle by Council on 2010 July 05 (LPT2010-43). Other applicable policies include the city-wide Parking Policy Framework (LPT2010-41) and Commercial On-Street Parking Policy (TT2013-0795).

Parking enforcement services and Municipal Impound Lot: Our parking enforcement services enhance public safety, improve traffic flow and mobility, and encourage compliance with municipal and provincial parking regulations.

Parking advisory services: We advise stakeholders and our peers in the municipal and provincial governments and in business and community organizations on parking issues, policy and regulations.

Residential parking permit services: We verify qualifications of applicants, and issue residential and visitor permits in this program designed to protect zone residents from the impact of non-local parking.

Management services for parking facilities: Our parking management program and expertise makes our services valuable to clients who desire to have their parking managed by specialists.

Preventive Maintenance Program

The maintenance of our facilities is currently managed through an extensive database, which highlights all work, required by our Facilities division. In addition to this, an in-house software program links our preventive maintenance program, parts inventory and work orders into one data base.

Facility management

All our facilities are monitored each year by a structural engineer of record and HVAC consultant for the critical areas identified as unique to each facility. Mechanical and electrical expertise is consulted on an annual basis. Regular monitoring allows us to forecast appropriate expenditures required for long-term maintenance of the structures. Monitoring our facilities includes reviewing all elements from roof condition to mechanical system operations; from membrane wear to structural integrity of our slabs. In addition, we continue to real time monitor our facilities by our Building Management System with over 21,000 points of monitoring.

In 2009, CPA completed an energy audit on all its facilities and implemented upgrades where applicable. The CPA continue to add points each year ensuring proper use, energy conservation and recording of life cycle usage. As a management strategy CPA is trying to ensure mechanical and structural compliance through best practices thereby extending the current lifecycle of these assets.

Funding challenges

The Calgary Parking Authority continues to monitor and fund initiatives for life cycle review and asset management strategies. The CPA will be including new budget funding, pending approval for the actions necessary for infrastructure lifecycle maintenance and energy and efficiency upgrades.

Key issues and challenges

Surface membranes

All of our indoor parking structures have a protective membrane installed which protects the concrete and rebar in the floor slabs from wear and corrosive materials. As our infrastructure ages, the membranes wear off, particularly in the drive lanes, entry lanes and on corners. Our continuous maintenance of these membranes is vital in preserving the structural integrity of the facility. This process continues to be vital in our structural maintenance program.

Our preventive maintenance system identifies the need for constant re-coating of the wear areas to maintain the protection of the structural slabs. As these systems reach the end of their expected life, extensive re-coating will be required.

Surface lots

Most surface lots require a regular repair and maintenance program. Several of our surface lots will require extensive surface and drainage upgrades. CPA aligns with The City's Triple Bottom Line policy, Crime Prevention Through Environmental Design and LEED (Leadership in Energy and Environmental Design). The CPA reviews lighting at surface lots as well as evaluates the possibility of using such materials as permeable asphalt membrane and recharge of the aquifer.

Structural preventive maintenance

A couple of our parking structures have significant structural risk that is mitigated by ongoing inspection and repair programs. The most significant are listed below.

City Centre Parkade

Our oldest parking structure, and the only open air designed structure in our inventory, requires major maintenance over the next few years. The exposure to the elements, specifically snow and road salt brought into the parkade by vehicles, has contributed to the membrane failure and waterproofing issues.

Built in the late 1970s, the major structural elements are the slabs, beams and columns. The underside of each slab is not protected with a

membrane coating, so without constant annual maintenance and a lifecycle program at five-year intervals, cracking and concrete delaminating will lead to corrosion and eventual failure. This facility has very aggressive turn patterns, specifically on the center ramp, and an ongoing maintenance program is required to ensure that the membrane does not wear to the point that the structural slab integrity is compromised.

This lifecycle program is currently scheduled at three-year intervals. Ongoing inspections and repair programs will mitigate concerns. Within the next five years a major rehabilitation of all structural elements will have to be undertaken on this facility.

McDougal Parkade

This underground parking structure was built in the early 1980s. This unique parking structure, built adjacent to the McDougal School heritage site, was constructed using a structural element of unbonded post-tensioned cables.

This structure is typically below the water table during spring run off and as such the concrete walls leak extensively every spring. The combination of leaking walls and the unbonded post tension cables could be disastrous if extensive corrosion of the cables were to occur. To ensure the structural integrity of this facility, a program of ongoing inspection, delamination repair and wall crack repair has been developed. It has been determined that this facility is experiencing a higher than normal





trend of structural failures due to the above conditions. A monitoring program has been developed in consultation with expert engineers to provide remedial advice on a rehabilitation and preventative repair plan.

City Hall Parkade

This underground parking structure was built in the early 1980s.

This unique parking structure is built under a city park. Due to the June 21, 2013 flood, the entire parkade (all seven floors) was submerged under water for two weeks. The entire infrastructure (electrical, mechanical, venting, elevators, etc.) has been replaced and resiliency has been put in place to mitigate the impact of potential future floods.

James Short Parkade

This underground parking structure was built in the late 1980s. This unique parking structure, built under a city park, has mechanical systems that will be in need of upgrading and improved monitoring. This facility is regularly monitored for possible geo-technical rebound or other structural movement issues.

Mechanical upgrades

All ventilation equipment in two of our parking structures has reached its expected life cycle of 20 years. These systems will be replaced in 2015 to eliminate the high costs of constant maintenance and repair. Furthermore, the majority of the equipment is inefficient and monthly utility costs are 50 per cent higher than that of our newer facilities. In keeping with our energy conservation program and to eliminate the high maintenance, repair and operating costs, this equipment is forecast to be replaced over the next three years.

In addition to the regular life-cycle maintenance of CPA's assets, eventually there will be a need to replace CPA's parkades. In 1999, an analysis was performed by consultants and the conclusion was that all of the parkades should achieve their design life of 50 years, provided that proper repair and maintenance work is performed as required.

In 2009, external consultants were hired to re-assess the facilities and the facilities should achieve their design life if the membrane replacement program and concrete repairs are maintained. A heavy financial burden will arise when some of these facilities reach the replacement stage in about 15 to 23 years where CPA's three oldest parkades (City Centre Parkade built in 1978; McDougall Parkade built in 1983; and Civic Plaza built in 1985) require replacement. The Parkade Structure Replacement Fund was established in 1999 for annual contributions of \$2 million plus interest which would provide for partial capital replacement funding. At the end of 2013, this fund has \$46 million.

Vehicles

Facilities Maintenance have a fleet of trucks and small tractors that have regular usage mileage, but high maintenance needs due primarily to the difficult task of snow removal and frequent start and stop operation. Each year, at least two to four vehicles require extensive repair to maintain the fleet to acceptable standards, giving us the confidence that the fleet will be running for regular maintenance assignments and when snow removal is required. Fifty per cent of facility vehicles are near their life expectancy and a replacement strategy of three vehicles

per year over the next three years will renew the fleet.

Our fleet of vehicles for the enforcement officers sustains high mileage due to the area they cover. In order to minimize breakdowns associated with high mileage, the vehicles are turned over on average every three to four years. With a fleet of 53 cars, we turn over 10 to 12 cars per year. Calgary Fleet Services is contracted to perform routine maintenance and warranty work.

Revenue control equipment

The Calgary Parking Authority utilizes the ParkPlus System™ which allows the option of paying at the pay machines or various web options. Additional pay machines will be required to extend the payment system to areas where the construction projects are presently coming to a completion, as well as into new areas of the city as parking demand requires additional controls.

Information technologies

Allowance must be made for the funding of the replacement of data storage, data network, server, desktop computer, uninterruptible power and other disaster recovery infrastructure systems to provide uninterrupted services for the various operations within the CPA.

Costs associated with software development of both currently deployed and future software that will provide enhancements and new services to make the business processes more efficient must also be taken into consideration.

Systems such as ParkPlus System™, payment of tickets online (PTO), BITS, etc. are only a few of the current in-house software packages that require ongoing

maintenance both on hardware and software levels.

Security video, access and cellular wireless repeater control systems are integral parts in the support and maintenance of the corporate infrastructure. These systems are being supported by the IT Department and are comprised of computer and data storage components which require regular upgrading and repairs.

All of the above information shows that both hardware and software funds are required to support these critical business systems on an ongoing basis.

What do we own/manage?

Parking spaces off-street

- Seven parking structures (5,525 parking spaces).
- 32 surface lots (2,745 parking spaces).
- Impound lot land (1,040 spaces for impounded vehicles).

Machinery and equipment

- 621 on-street ParkPlus System™ pay machines as revenue payment controlling 6,729 parking spaces.
- 46 off-street (surface lots) ParkPlus System™ pay machines as revenue payment controlling 2,745 parking spaces.
- 46 ParkPlus System™ pay machines in parkades as revenue payment controlling 5,525 parking spaces.
- 94 vehicles (52 enforcement, four technical services, 18 facilities, eight security, four impound lot, six ParkPlus System™ camera vehicles, two pool cars).
- One utility trailer.
- Six heavy machinery (tenant sweepers, bobcats).

Buildings and land

- CPA administration office located on street level of the Centennial parkade.
- Impound Lot Building located at 3990 Manchester Rd. S.E.
- Land on 148 10th St. N.W. (Ant Hill site) still on CPA's books until land title is transferred.
- Building on 615 Third Ave. S.W. (Veritas Building).
- Building on 121 Eighth Ave. S.W. (Criterion Building).
- Land on 830 Ninth Ave. S.W. (Roadhouse).

Systems

- ParkPlus System™.
- BITS (Bylaw Infraction Tracking System).
- Impound Lot Vehicle Tracking System.
- Automated Dispatch Tracking System.
- Pay Tickets Online (PTO) via web services linked to BITS.
- Credit Card Processing System including Payment Card Industry Compliancy.
- Access to the Internet through the CPA Corporate Connection complete with associated hardware and systems.
- Web services for external and internal users.
- Security video, access and cellular wireless repeater control systems for parkades and office areas.
- Corporate data storage, server and data networking systems that support data collection and repository systems with the corporation.
- Intranet.
- iPhone application.



Calgary Police Service (CPS)

The Calgary Police Service (CPS) along with other agencies is instrumental in maintaining the safety of Calgary and quality of life of its citizens. We are dedicated to community policing. Our primary focus is on crime prevention, detection, apprehension and traffic safety. Our most effective tools are:

- Positive community relations.
- Education.
- Problem-solving.
- Use of current technology to analyze conditions, project trends and deploy resources.

The assets which the Calgary Police Service manages include:

Buildings

The CPS occupies space in 27 buildings which are owned by The City or leased from third parties.

Systems

The CPS has a paging system, including related equipment.

Machinery and equipment

- Approximately 1,200 vehicles and two helicopters.
- Approximately 2,360 personal computers plus an additional 430 vehicle-mobile workstations.
- Servers and other computing or computer network equipment and systems.
- 2,336 mobile or portable radios.
- Digital traffic cameras and the infrastructure necessary to operate these cameras.
- Automated fingerprinting system.
- Various pieces of traffic equipment, robots and breathalyser equipment.

Asset condition

The majority of assets in the CPS range from fair to good condition.

Key issues and challenges

CPS asset infrastructure management strategy is split into two categories. The larger category includes facilities, vehicles, and communication and information systems which support the operation of the CPS. The target in this area is to maintain service levels through asset maintenance or replacement as required and to acquire additional assets to support community growth. The second category includes specialized policing equipment and systems. The goal for this category is to use currently available technology for analyzing conditions, projecting trends and deploying resources. Significant resources have been committed to such things as wireless infrastructure and traffic issues reflecting public safety concerns.

Current challenges faced by CPS related to the management of their infrastructure include:

- Population growth.
- Demographic change.
- Geographic growth.
- Increased volumes of crime and social disorder.
- The emergence of organized crime.
- Emergency preparedness.
- The proliferation of internet use in criminal activities.
- Increasing traffic volumes.
- Legislative and policy changes.

The evolution of technology impacts the management of CPS operations in two ways. First, CPS can leverage technology to achieve day-to-day efficiencies. Second, CPS must monitor and apprehend individuals involved in criminal activities linked to technology. These challenges are met through hiring skilled people, who in turn require additional infrastructure (e.g. vehicles and equipment). CPS is managing these impacts and the expectations of the community through fiscal responsibility and efficient and effective operations.

Calgary Public Library (CPL)

The Calgary Public Library's (CPL) asset portfolio consists of the following categories: materials, buildings, IT infrastructure and equipment, furniture and equipment, and vehicles. CPL does not own buildings or land, but is the steward of the buildings it occupies. Any land improvements are associated with a building and are included as a subset of those assets.

All asset conditions range from good to excellent, with the exception of the following buildings:

Central	Critical
Alexander Calhoun	Fair
Fish Creek	Fair
Memorial Park	Poor

The Calgary Public Library Board is currently allocating reserve funding for both maintenance and growth from its operating budget as its primary asset management funding strategy. The Calgary Public Library recognizes that use of this reserve funding strategy diverts funds that could be spent immediately on increased staffing for programming and customer assistance, or on materials for customer use, however, without this strategy, there would be no funds available to maintain or replace the asset when needed. Without accessing the reserve funds, the asset on which the service provision is dependent, and eventually the provision of service, will be detrimentally affected.

The reserves decline with the planned replacement of assets that are at the end of their useful life, refurbishment of existing assets or purchase of growth assets. These expenditures are funded primarily by the allocation of a part of the current year's operating budget and by available capital grants or operating surpluses. This funding strategy allows the library to maintain its facilities on an optimal refurbishment period every 10 years for these heavily used public buildings. Growth and major maintenance projects are dependent on funding from outside sources, which historically have been provided by The City of Calgary and the province.



Appendix #7

Glossary of acronyms and abbreviations

AMP	Asset Management Plan	IIP	Infrastructure Investment Plan
APTA	American Transportation Association	IIS	Infrastructure & Information Services
BU	Business Unit	ISR	Infrastructure Status Report
CAMP	Corporate Asset Management Plan	IT	Information Technology
CBS	Capital Budget System	LEED	Leadership in Energy and Environmental Design
CFD	Calgary Fire Department	LOS	Levels of Service
CHC	Calgary Housing Company	LRFP	Long Range Financial Plan
CHP	City Owned Portfolio (Office of Land Servicing & Housing)	LRT	Light Rail Transit
CLOS	Customer Level of Service	LRV	Light Rail Vehicle
CMHC	Canada Mortgage and Housing Corporation	OLSH	Office of Land Servicing & Housing
CPA	Calgary Parking Authority	PARIS	Parks Asset Reporting and Information System
CPB	Corporate Properties & Buildings	PAYG	Pay-As-You-Go
CPL	Calgary Public Library	PSAB 3150	Public Sector Accounting Board, Standard 3150
CPRIIP	Culture, Parks, Recreation Infrastructure Investment Plan	PSAM	PeopleSoft Asset Management
CPS	Calgary Police Service	PTO	Payment of Tickets Online
CS&PS	Community Services & Protective Services	SGCI	Strategic Growth and Capital Investment
ERIIP	Emergency Response Infrastructure Investment Plan	TCA	Tangible Capital Assets
ESRD	Environment & Sustainable Resource Development	TI	Transportation Infrastructure
HVAC	Heating, Ventilation and Air Conditioning	UEP	Utilities and Environmental Protection
		W&RS	Waste & Recycling Services
		WIIP	Water Infrastructure Investment Plan



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ENTRANCE

ENTRANCE





GREYHOUND

Crowchild Tr
NORTH
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