State of Infrastructure Report 2013

London
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Acknowledgement

The Corporate Asset Management office would like to acknowledge the efforts of the staff of the individual City of London Service Areas, including Tangible Capital Assets and Financial Planning & Policy, for all the time, effort and support they put forth to help accumulate the data and develop the findings of this State of Infrastructure Report.

Picture 1 Forks of the Thames River

Contact Information:

Corporation of the City of London
Corporate Asset Management Division
City Hall, 6th Floor Room 610
300 Dufferin Ave., PO Box 5035
London, ON N6A 4L9
www.london.ca

CH2MHILL
245 Consumers Road, Suite 400
Toronto, ON M2J 1R3
www.ch2m.com

Executive Summary

This State of Infrastructure Report (SOIR) documents the current state of London's core infrastructure under the direct ownership and control of the Corporation of the City of London. This infrastructure enables the City to deliver services to London residents. The areas covered in this report include Water, Wastewater-Sanitary, Wastewater-Stormwater, Roads & Structures, Traffic, Parking, Solid Waste, Parks, Recreation, Urban Forestry, Fire, Long Term Care, Fleet, Facilities, Information Technology and Land. This report reviews our assets and forms a picture of our asset base as a snapshot in time at the end of 2012 which can be used to inform and guide decision-makers.

This report also speaks to the development of more robust asset management practises in the future which are expected to provide better asset information; thereby increasing the confidence with which we can predict future trends and make informed decisions.

The City owns infrastructure with a total current replacement value of **$10.9 Billion**. Analysis concludes that the City has a current infrastructure gap of **$52.1 Million**; roughly 0.5% of the total replacement value. To put this in context, a furnace represents approximately 1% of the value of a home but still presents a financial challenge to budget when it comes time to replace. Discussion about the infrastructure gap is not new. The City has undertaken many activities including developing reserve funds to maintain financial stability and keep the infrastructure gap under control. Other communities are reporting infrastructure gaps in the billions of dollars. However it is also true that our infrastructure is aging and continues to need renewal and replacement as it nears the end of its useful life. The challenge we face is to find ways to control growth of the infrastructure gap. Based on our existing budget plans, the infrastructure gap is forecasted to grow to **$466.1 Million** over the next 10 years.

City of London Infrastructure Summary			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$ 10.9 Billion		**$ 52.1 Million**	**$ 466.1 Million**

Failing to address growing infrastructure needs will result in increased risk of infrastructure failures that will negatively affect Londoners quality of life through more frequent impacts like road closures, water alerts, unkempt parks, etc. Failure to take care of a minor repair in the short term can lead to more costly solutions in the future. The City's projected life cycle investment plans will not meet the needs of our infrastructure. If nothing is done to address the projected shortfall, the infrastructure gap will continue to grow, resulting in an untenable situation. The most efficient way to manage our assets is through well planned investments; making the right investment at the right time for the right amount.

Choices are available as to how the City can manage the infrastructure gap.

The City can continue to deliver services at their existing levels by committing to make required investments thereby stabilizing or even eliminating the infrastructure gap. The City receives its funding through taxes, utility bills, user fees, transfer funding from upper tier governments, gifts, efficiencies and debt. Funding sources are limited and the City needs to manage its services within its means. The infrastructure gap needs to be addressed in an affordable well planned fashion and not simply be deferred onto future generations. However, paying for the gap is not the only opportunity.

Picture 2 - Fanshawe Park Road

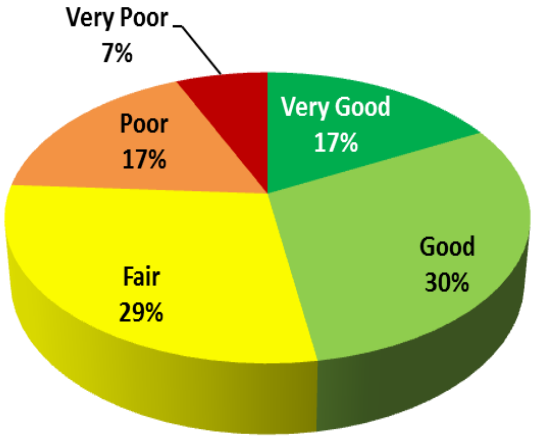
The City can reduce levels of service to match its ability to pay. This is the realization that you get what you pay for. Generally there is an unwillingness to give up services currently enjoyed and a strong desire to improve services. There is also recognition that some services are essential and cannot be eliminated.

A third opportunity for the City is to find more efficient and effective ways of delivering services, including changing the asset mix that supports service delivery to the community. The City strongly supports this direction and regularly invests in improvements. One element of this third approach is the work underway to enhance our asset management practices.

The City has a long-standing practise of pursuing all possible means to achieve our service delivery goals and has been reasonably successful delivering quality services when compared to other municipalities. In effect the City adopts a blend of the three approaches outlined above. However, to date, this has shown to be insufficient to fully contain the growth of the infrastructure gap. Continued effort and evolution of our asset management practices are required.

The overall condition of the City's assets is rated as **Fair** to **Good** (Figure 21). Assets in Fair condition require attention, are showing general signs of deterioration with some elements exhibiting significant deficiencies. Good condition indicates that the infrastructure is adequate for now with some elements showing general signs of deterioration that require attention. The assets that are of concern to the City are the smaller fraction of assets listed in Poor or Very Poor condition. These are the assets that are approaching the end of their useful lives. They may still be functioning but at a questionable level of service and the City needs to be prepared to

Figure 1 – Overall Asset Condition by Replacement Value



respond to failures or proactively address them before they fail. For example, at some point your personal car wears out and the costs to repair it far outweigh what the car is worth. Determining the best time to replace the car, before it fails, is similar to the challenges faced by asset managers as they strive to sustain delivery of quality services.

Report Findings

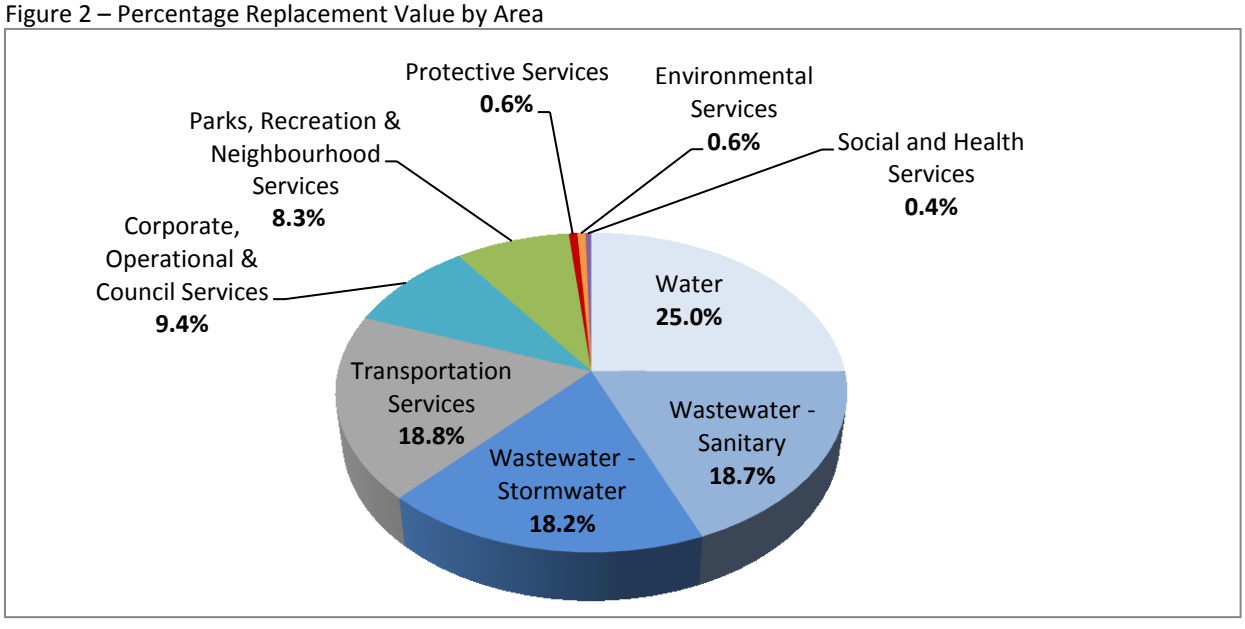
This report presents the inventory of the City's assets, their replacement value, their condition and the projected funding needed to replace them as they deteriorate.

Figure 2 presents the percentage of asset replacement value by service. Although this report is directed at assets, assets alone do not reflect the entire value of the services provided by the City. Many important services such as Parking, Long Term Care, etc. have very little hard asset value. While reading this report, one must bear in mind that funding for assets is only one aspect of our City's financial requirements. The real focus of the City is providing services that sustain or improve quality of life.

Table 1 What do we own? - Highlights

Asset	Inventory	Unit
Water Main	1,570	Km
Sanitary Sewer	1,430	Km
Wastewater Treatment Plants	6	Ea.
Storm Sewer	1,304	Km
Stormwater Management Pond	75	Ea.
Road	3,717	Lane Km
Bridge	101	Ea.
Sidewalk	1,471	Km
Park Land & Natural Area	2,436	Ha
Pathway & Trail	206	Km
Trees (ROW, Park, Woodlot)	1,026,623	Ea.
Arena	11	Ea.
Aquatic Facility	40	Ea.
Community Centre	13	Ea.
Fire Station	14	Ea.

Figure 2 – Percentage Replacement Value by Area



This report uses a combination of methods to determine the asset conditions presented. Some assets undergo routine formal condition assessments. However for a large part of the asset base, condition information is based on the age and expected useful life of the asset.

Figure 3 Asset Condition by Area (excludes Boards and Agencies)

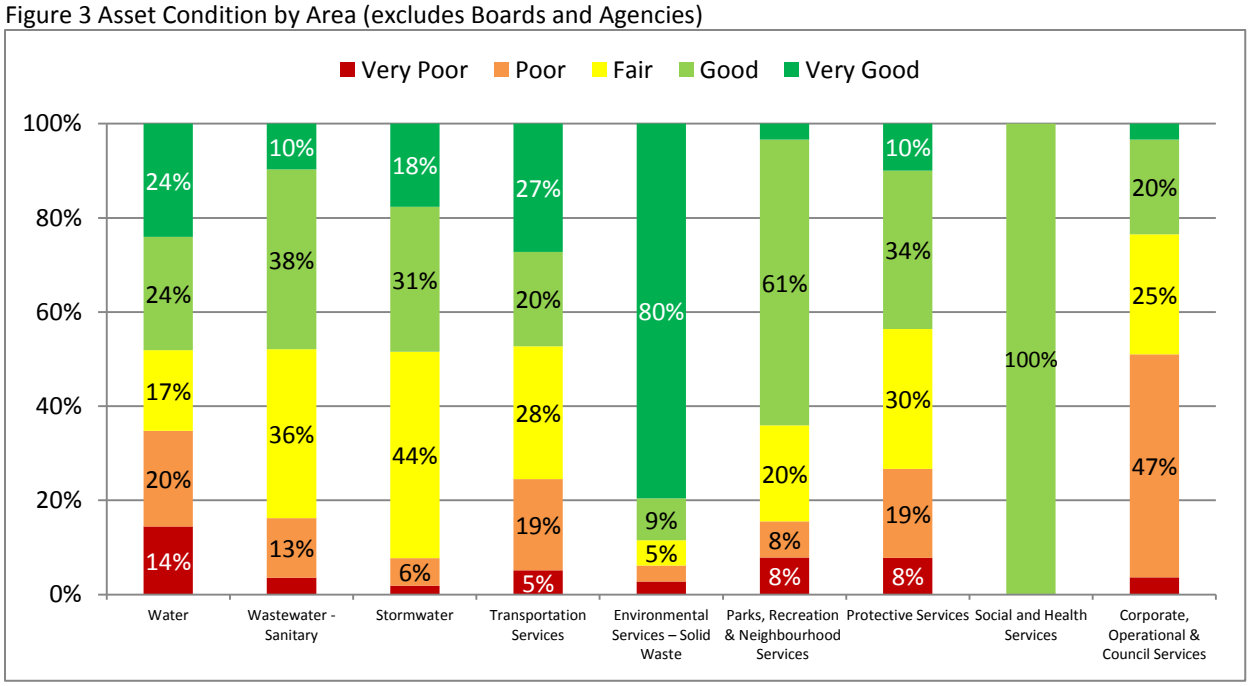


Figure 3 reflects the condition of the City's assets at the end of 2012 by area. The bands of red and orange reflect the areas of greatest need. For example, at the end of 2012 19% of Transportation's assets were evaluated as being in Poor condition while 5% were shown to be in Very Poor condition. This reflects an area in need of investment. Roads are still open but risks are higher that Poor road condition will lead to increased potholes, vehicle damage, slower speeds, longer commute times, greater gas consumption, etc.

The findings in this report are consistent with the Canadian Infrastructure Report Card regarding municipal infrastructure across Canada meaning that in general, London shares the issues faced by the rest of Canada (Table 2).

Table 2 - Infrastructure Condition - London Compared to the Canadian Infrastructure Report Card

Service Area	2012 Canadian Infrastructure Report Card	2012 London State of Infrastructure Report
Water	Good	Fair to Good
Wastewater - Sanitary	Good	Fair to Good
Stormwater	Very Good	Fair to Good
Roads	Fair	Fair

The City of London currently invests in the renewal of its infrastructure through capital budget projects. This report measures the difference between what we plan to invest through the budget process and what we need to invest in order to sustain the services delivered using infrastructure.

Table 3 illustrates the difference between current spending plans and investments required in our infrastructure. It also forecasts the infrastructure gap over the next decade should the City maintain its current spending plans.

Table 3 - Current and Future Infrastructure Gap per Service Area

Program Area	Service Area	Replacement Value ($000's)	Infrastructure Gap	
			Current ($000's)	In 10 Years ($000's)
Water, Wastewater Services	Water	$2,734,373	$1,941	$37,800
	Wastewater - Sanitary	$2,043,409	$0	$21,802
	Stormwater	$1,993,151	$0	$973
Transportation Services	Roads & Structures	$1,832,115	$26,705	$236,165
	Traffic	$214,937	$6,856	$35,474
	Parking	$5,694	$0	$0
Environmental Services	Solid Waste	$64,237	$0	$5,142
Parks, Recreation & Neighbourhood Services	Recreation	$246,832	$0	$7,314
	Parks	$141,358	$4,990	$43,763
	Urban Forestry	$513,300	$637	$9,070
Protective Services	Fire	$66,156	$0	$0
Social and Health Services	Long Term Care	$45,593	$0	$2,562
Corporate, Operational & Council Services	Corporate Facilities	$149,532	$9,589	$55,199
	Culture Facilities	$31,471	$0	$0
	Fleet	$44,994	$0	$0
	Information Technology	$46,100	$1,342	$10,867
	Land	$751,890	$0	$0
Total		**$10,925,142**	**$52,060**	**$466,131**

The information in Table 3 shows that the largest infrastructure gap amounts are associated with areas having the highest replacement values such as Transportation Services. However, the results are not intended to suggest service areas with higher replacement value should have their needs prioritized over the needs of any other group. Rather, the City should maintain all of its assets in a condition that supports service delivery. For example, Information Technology (IT) Services has a lower total replacement value and infrastructure gap compared to the Water service area. This does not reflect the importance of either service area to the City as a whole. Both services have critical elements. Furthermore they are connected in the system where failure of either, impacts both. For example, a sink hole has the potential to affect road, water, sewer, IT and traffic, etc. assets. Deterioration of any of the assets within the City's asset network has potential to affect the performance of other assets and ultimately the services delivered.

Picture 3 Labatt Park

There are stories behind the infrastructure gap, or lack of infrastructure gap, in each service area. Table 4 discusses some of the key background elements behind the results.

Table 4 – Discussion on the 10 year infrastructure gap

Transportation Services	**$271,639,000**
This area has some of the strongest asset management tools and practices in the City which are used to meet the legislated and regulated Minimum Maintenance Standards for inspection. However this is also the service area with the highest infrastructure gap and potentially highest concern. The historical underfunding of Transportation has led to an overall decline of infrastructure and a significant accumulation of backlog works. This is in part due to inconsistencies in transfer funding from upper tier governments which strongly influence London's capital programs. This service area does not have a dedicated revenue source such as rates or fees which limits its ability to address sustainability needs. The City is looking at future opportunities to explore potential sources of Transportation funding. This infrastructure gap will become visible to Londoners through rough roads, potholes, increased vehicle damage claims, reduced road safety, poor pedestrian facilities, lighting and signal failures, bridge load restrictions, closures and increased operating costs. The Transportation service area has embarked on an initiative to enhance its services through the SmartMoves master planning exercise. London is also recognized (OMBI 2012) as having high levels of traffic congestion. Transportation has been directed by Council to develop a long term financial implementation strategy to address the infrastructure gap, growth, inflation and service improvement requirements.	
Corporate, Operational & Council Services	**$66,066,000**
This section of the report covers the assets of corporate and culture facilities, fleet, information technology and land. • Management of the facility assets falls to the Facilities Division. The infrastructure gap is primarily driven by the future investment requirements of City Hall and its parking garage. The facility infrastructure gap is based on data derived from the regular facilities condition assessment program with a maximum acceptable Facility Condition Index of 10%. • Fleet operates on the basis of reserve funding and internal rate transfers and does not have a current or future infrastructure gap. • The information technology infrastructure gap is driven by high turnover requirements of assets with short useful lives compared to the projected funding. • The Infrastructure gap analysis does not apply for Land assets. Allowing the Corporate, Operational & Council Services infrastructure gap to grow will result in localized reductions to service including increased maintenance costs, localized closures, relocations, inconvenience to staff, operational inefficiencies, inability to adapt to changing technology, decreased productivity, loss of data and communications, etc. Discussion surrounding the future of City Hall and its parking garage continue. Facilities asset management continues to evolve. Sound management practices allow Fleet Management Services to maintain the serviceability of their assets without generating an infrastructure gap. ITS has taken the first steps towards inventory management; the new Information Technology Asset Management program will result in more robust asset information in the future.	

Water, Wastewater Services	$60,575,000

Water and Wastewater infrastructure consists of pipe conveyance networks and treatment / pumping facilities. Renewal efforts have been deferred due to budget limitations for many years. The pipes infrastructure gap is driven by age and material (For example, water pipes installed in the 1930's through the 1970's are all failing. The 1950's through 70's pipe is failing at a much higher rate than those installed in the 1930's. Cast iron pipe is failing at a higher frequency every year. Lead service connections need to be replaced. Combined sewer overflows need to be separated).

The facilities infrastructure gap is driven by the requirements of individual processes and specific equipment based on their age and use. Compiling the data results in a finding that the infrastructure gap increases over the next decade.

This infrastructure gap will impact Londoners through localized reductions to service including potential reductions in water quality, increased break frequency, sewer backups, service outages, increased maintenance costs, etc.

This area receives its revenue primarily through utility rates. During the 2013 Water and Wastewater budget approval processes a new funding model (Rate Structure Review) was adopted. Administration recommended rate increases in 2013 through 2017. With these changes the Water and Wastewater Service Area intends to address the effects of declining consumption, increased wholesale water costs, inflation, non-revenue water loss and the addition of new revenue sources to reach financial and rate stability by 2018. Although the infrastructure gap initially increases over the next 10 years it is expected to decline over the next several decades by following the new funding model.

Parks Recreation & Neighbourhood Services	$60,147,000

Parks, Recreation & Neighbourhood Services assets in this report consist of facilities, multi-use pathways, parks (including their amenities) and trees. The infrastructure gap for Parks, Recreation & Neighbourhood Services is primarily driven by the requirements projected in the multi-use pathway system and numerous categories of park amenities. There is a projected annual shortfall of $4 Million for capital maintenance and renewal of the Thames Valley Parkway, multi-use pathway system and park amenities based on replacement value and estimated useful life. The facilities infrastructure gap is driven by condition and age; management of these assets falls to the Facilities Division who use sound asset management practices. The infrastructure gap for trees is driven by a long history of underfunding and loss of inventory. Aside from facilities, the lack of formal asset management practices in Parks, Recreation & Neighbourhood Services require the use of reactive field observations to respond to maintenance needs. Condition, age and maintenance history are not formally tracked and/or easily accessible. This makes predictions for future renewal requirements difficult.

This infrastructure gap will impact Londoners through localized reductions to service, global service reductions such as fewer parks per capita, visual signs of deterioration, potential closures of amenities, high maintenance costs, reduced operating hours, etc. For trees the infrastructure gap manifests itself in increased insect and disease damage, increased tree related damage, and a reduction to the number of trees along with the benefits they provide for air and water quality, habitat, and recreational uses. Ultimately the Parks, Recreation & Neighbourhood Services infrastructure gap leads to reduced quality of life and less recreation opportunities for the public.

Parks is in the process of developing computerized maintenance management and asset management processes. The improvements are expected to result in more robust information regarding their asset inventory, condition, investment requirements, etc. The City intends to complete the Urban Forest Strategy in 2014 which will support the Official Plan and identify tree cover targets, policies, guidelines

and practices that will govern the management of the urban forest for the next twenty years with the goal to reverse current trends.	
Social and Health Services	**$2,562,000**
Social and Health Services assets in this report include the Dearness Home. The infrastructure gap is primarily driven by the life cycle renewal needs of this facility. The infrastructure gap is low because the facility is relatively new. As the building ages and critical components start failing, a significant increase in maintenance investment will be required that is not currently in the budget forecast. Failure to address the Social and Health Services infrastructure gap will, in the long term, impact the quality of life for the residents at the Dearness Home; potentially resulting in the City failing to comply with regulations. Asset management at the Dearness Home is intended to improve through implementation of the Corporate Asset Management program.	
Environmental Services	**$5,142,000**
Environmental Services assets in this report include the W12A landfill, closed landfills, Material Recovery Facility, transfer stations and facilities. Funding levels are sufficient to maintain current operations; however additional investment will be needed to meet the Province's long-term waste reduction targets and provide landfill service beyond 2023. Failure to address the infrastructure gap would result in increased risk to public health. Solid Waste has covered the majority of their infrastructure requirements through prudent strategy of saving, via reserve funds, in advance of forecasted capital expenditures but still require an additional $5 Million over 10 years to address projected needs.	
Protective Services	**No Gap**
Protective Services assets in this report include fire stations, light & heavy vehicles and equipment. Funding levels are sufficient to maintain current operations. There is no current or forecasted infrastructure gap. Fire services utilize a dedicated reserve fund for their vehicles. Provided the existing plans are adhered to, Fire's assets are well positioned to support service delivery over the coming decade.	

There are no easy solutions to how the entire system works together to achieve an optimal delivery of services. Additional efforts are required to address the infrastructure gaps beyond what is currently planned. These efforts could include additional funding, level of service changes, etc. The City is developing a Corporate Asset Management program that is making progress towards optimizing asset management practises in London. As part of the Corporate Asset Management program and in response to provincial requirements a companion document to this State of Infrastructure Report called the Corporate Asset Management Plan is being drafted. This document will guide efforts of the City to address the needs of our infrastructure.

If taxation and utility rates were the only source of funding, eliminating the infrastructure gap would require each London household to contribute an additional $306 now to address the current $52.1 Million infrastructure gap or $207[1] each year for the next 10 years to address $466.1 Million infrastructure gap. This equates to a sacrifice of less than a cup of coffee a day.

[1] Assuming a 5% discount rate over 10 years with payments received at the beginning of each year.

As common terminology the word ‘gap’ is used in multiple contexts. A popular use that has been reported elsewhere by the City refers to total funding required to address operating and maintenance expenses as well as capital requirements. These funding requirements are used to develop budget projections. The *infrastructure gap* reported here deals strictly with current infrastructure assets but the information can be used to help support overall financial planning.

The concern over an infrastructure gap is not so much that it exists. In fact, maintaining a controlled “gap” is likely indicative of prudent financial management. A balance must exist between the amount of preventative and reactive measures used to address infrastructure concerns and how much risk of asset failure is tolerable. At the time of this writing, in Canada, there is no standard or guidance to evaluate what is, or is not, an acceptable municipal infrastructure gap. In London’s situation a $52.1 Million infrastructure gap compared to a $10.9 Billion asset base could be considered well managed. The City of London is widely regarded for its water quality, recreation facilities, network of parks, etc. Not to be overlooked the City of London has also received a Aaa credit rating for 37 consecutive years; an illustration of its prudent financial management practices. The concern with the analysis presented in this report is that the current infrastructure gap is projected to increase over the next 10 years; indicating that projected investment in asset life cycle initiatives does not sufficiently address the needs of our current infrastructure.

This report is presented from a conservative perspective. It does not forecast growth, service improvements, or the effects of inflation on our infrastructure base. Growth impacts are intended to be addressed by the City’s operating principle that ‘growth pays for growth’. Improvements and inflation are expected to be addressed by future rate changes.

Maintaining the status quo, or the “do nothing” option regarding projected investments will result in a projected infrastructure gap of $466.1 Million in ten years. Over 20 or 50 years this growth has the potential to escalate beyond our ability to manage effectively. As there is no intent to allow this to occur, further action is needed to address both the understanding and forecasted growth of the infrastructure gap.

Picture 4 London - The Forest City

Conclusions

The City of London owns infrastructure with a replacement value of $10.9 Billion. The condition of the infrastructure is overall in Fair to Good condition meaning that the infrastructure is adequate for now with some elements showing general signs of deterioration that require attention and some elements exhibiting significant deficiencies.

The City of London has a growing infrastructure gap currently estimated at $52.1 Million. This means we are $52.1 Million short of what we need to sustain our $10.9 Billion in assets based on age and condition for the year ending 2012. At current investment rates, the gap will continue to grow over the foreseeable future resulting into a projected infrastructure gap of $466.1 Million by year end 2022. This information is not new but reaffirms our understanding of our City. In the past, Council has made choices that have kept the current infrastructure gap at a low percentage (0.5%) of the total asset base allowing us to continue to deliver quality services to the London community. Projected growth of the infrastructure gap is the concern that must be addressed. Reserve fund levels have increased over the last five years. However, it should be clear that current balances are not sufficient to fund all life cycle projects required in the next ten years.

Table 5 summarizes the service area infrastructure gaps in a way that helps put future plans in context. The City can reduce both the current and projected infrastructure gaps by focusing efforts on those areas that contribute the largest portions of the projected 10 year infrastructure gap.

Table 5 - Asset Category by Contribution

Category	Contribution to the Infrastructure Gap	Service Areas
Major Contributors	This group have gaps of greater than $20 Million in the next 10 years.	Roads and Structures Corporate Facilities Parks Water Traffic Wastewater (Sanitary)
Minor Contributors	This group includes those areas estimated between $5 and $20 Million gap in 10 years.	IT Urban Forestry Recreation Solid Waste
Non-Contributors	These areas have less than an estimated $5 Million gap in 10 years.	Long Term Care Stormwater Parking Fire Culture Facilities Fleet

The findings of this report are based on best available information however they reflect weaknesses in the processes the City of London uses to collect asset data particularly with respect to asset condition and the time and resources required to compile the information. The City is improving its asset management practices to address these areas of weakness through the implementation of the Corporate Asset Management program.

Recommendations

This State of Infrastructure Report provides a current view of the City's infrastructure. While the issues facing the City are not insignificant, they are manageable through careful planning and a coordinated and sustained effort from all involved.

The following recommendations are intended to support the City's efforts to implement its Strategic Plan, meet service delivery requirements, manage asset risk and strengthen future financial plans. The findings of this report should be used to:

1. Examine current and future investment priorities and the delivery of services with a view towards mitigating growth of the infrastructure gap; including examination of the current reserve fund levels used for life cycle renewal activities.

2. Develop the companion document, the Corporate Asset Management Plan. The Plan is a new requirement for transfer funding applications made to upper tier governments.

3. Develop the Corporate Asset Management Program including the implementation of its administrative policy, strategies, practices and procedures.

4. Improve areas in need of better asset data management processes.

5. Engage the public and help lobby upper tier governments for infrastructure funding.

This report is the first collective asset review for the City of London. It is a snapshot in time that clearly illustrates the challenges facing London when planning for sustainable service delivery. This document helps us to understand the Corporation of the City of London's current infrastructure portfolio, asset condition and infrastructure funding gap to aid efforts focused on proactively managing the infrastructure gap into the future.

"The complexity of things — the things within things — just seems to be endless. I mean nothing is easy, nothing is simple." - Alice Munroe

Picture 5 Wellington Street Downtown

Picture 6 Springbank Park Entrance

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Picture 8 Springbank Gardens – Manicured Park Tree

Purpose

Across Canada and around the world, concern has been raised regarding the sustainability of municipal infrastructure. The purpose of infrastructure is to enable the delivery of services to our citizens. The purpose of this report is to establish a good understanding of the current state of London's $10.9 Billion worth of core infrastructure and the challenges London faces in order to deliver our services. Our municipal infrastructure challenges are shared by other municipalities across Canada and include increased demand for public services in a context of constrained budgets and rising costs, all while dealing with economic uncertainties. This report investigates whether the base infrastructure owned by the City is appropriately funded and whether service delivery is sustainable. This baseline snapshot of London's assets will help our decision-makers prioritize future investments thereby improving our ability to efficiently manage our assets and deliver services.

This preliminary State of Infrastructure Report (SOIR) is a key building block for London's future management of its infrastructure assets. The report is intended to provide the following information:

- Details of the Asset Inventory – *What do we own?*
- Valuation of the Asset Base (Replacement Value) – *What is it worth?*
- Condition/Performance of the Asset Base – *What Condition is it in?*
- Investment Profile –What do we spend and what should we be spending?
- Problem Identification – What is the gap and how do we move towards sustainable service delivery?

Picture 9 Sherman Tank - Victoria Park

This report is a companion document to the first City of London Corporate Asset Management Plan. The Plan is intended to set the stage for resolving the issues identified by this SOIR thereby aiding London on its journey toward implementing universally accepted asset management practices. This SOIR lays the foundation for ongoing assessment and benchmarking, and allows the City to communicate publicly on the current state of the City's infrastructure. In this first issue of the report, we have focussed on the **"Core infrastructure"**, described generally as the infrastructure owned and internally managed by the City. Future iterations of this report will hopefully include all assets directly and indirectly owned or managed by the City, including those of municipal boards and agencies.

Background

Since the mid-nineties, many proactive and forward thinking municipalities have prepared and published State of Infrastructure Reports summarizing local infrastructure issues and requirements. These documents have played a key role in communicating and sharing infrastructure information with Council and the public, and supporting responsible planning and decision making. Using basic measures and plain language these documents provide information on the state and liability posed by public infrastructure assets, answering key questions and serving as a catalyst for engagement and discussion.

Since the introduction of the new Public Sector Accounting Board (PSAB) 3150 legislation in 2009, Canadian local governments and public agencies have been required to report in their annual financial statements the historic cost, amortization, and net book value of their assets. Along with its conversion to service based budget practices, the City of London viewed this legislative change as an opportunity to enhance its asset management practices and put the City on a path to financial sustainability. In 2011, a Corporate Asset Management office was created and commenced the development of a corporate based asset management program. One of the steps in the development of this program is the generation of this State of Infrastructure Report.

Initiated as good asset management practice, the role of reporting on the state of infrastructure has evolved over time to support other key business requirements, driven by Provincial and Federal regulations. In 2012, Ontario's Ministry of Infrastructure introduced "Building Together", its strategy supporting the sustainment and growth of core municipal infrastructure within the Province. Under this initiative, municipalities seeking provincial capital funding are required to prepare and support a detailed Asset Management Plan (AMP), which includes a current summary of the state of local infrastructure under its jurisdiction. The information contained within this State of Infrastructure Report (SOIR) supports the development of London's companion document the comprehensive Corporate Asset Management Plan. Together these reports are intended to fulfill future requirements for transfer funding from upper tier governments in support of the infrastructure base.

Picture 10 Walter Blackburn Memorial Fountain

Approach

This section describes how the findings of the report were determined and presented. Further details by service area can be found in Appendix 1. These explanations cover condition analysis, infrastructure gap determination and the method by which data accuracy and reliability were rated and are intended to enhance the ability to understand the graphics used in this report.

Picture 11 Victoria Park North West Entrance

Asset Condition Rating

The condition of each asset group was evaluated to represent the current 'health' of the City's infrastructure. A five-point rating scale (Table 6) was used to align with that employed by the National Infrastructure Report Card produced by the Federation of Canadian Municipalities (FCM), the Canadian Society for Civil Engineering (CSCE), and the Canadian Construction Association (CCA). In addition to providing a sound basis for assessment, this will allow us to benchmark the results against the values presented in this document. Ratings range from 1 to 5, as described in the table below, reflecting each asset group's physical condition.

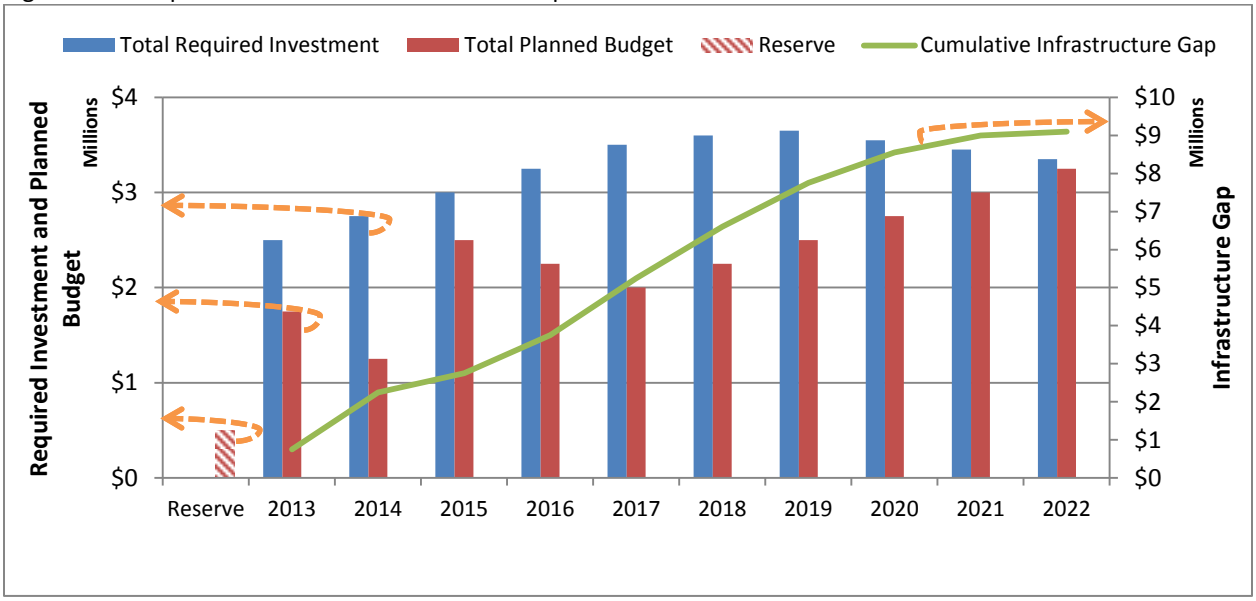
Table 6 - Condition Scale and Definitions

Grade	Summary	Definition
1	Very Good Fit for the future	The infrastructure in the system or network is generally in very good condition, typically new or recently rehabilitated. A few elements show general signs of deterioration that require attention.
2	Good Adequate for now	The infrastructure in the system or network is in good condition; some elements show general signs of deterioration that require attention. A few elements exhibit significant deficiencies.
3	Fair Requires attention	The infrastructure in the system or network is in fair condition; it shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies.
4	Poor At risk	The infrastructure in the system or network is in poor condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration.
5	Very Poor Unfit for sustained service	The infrastructure in the system or network is in unacceptable condition with widespread signs of advanced deterioration. Many components in the system exhibit signs of imminent failure, which is affecting service.

Infrastructure Investment Gap Chart

Each Service Area chapter includes an Infrastructure Investment Gap chart (Figure 4) indicating the annual required investments, the City's planned budget and the resultant infrastructure funding gap over the next decade; it being noted that any planned investments beyond 2013 are only forecasts that have not been approved and are subject to budget approval in their respective years via the City of London budget process. The chart highlights whether the past maintenance, rehabilitation, and replacement of these assets have been sufficient (the current gap), and whether projected planned investments are consistent with the anticipated infrastructure needs over the next decade (gap in 10 years).

Figure 4 - Example of Infrastructure Investment Gap Chart



The chart displays the following information:

- The *Reserve* red hatched bar represents the "savings" the City has accumulated to help offset investments required for infrastructure.
- The *Total Required Investment* blue bars represent the projected investments required to maintain our existing assets.
- The *Total Planned Budget* red bars represent the amount of investment the City currently forecasts spending on Life Cycle Renewal of its infrastructure.
- The *Cumulative Infrastructure Gap* green line is the sum total of the differences between the Total Required Investment and the Total Planned Budget (blue bar minus red bar).

Reserve Funds / **Reserves** are amounts set aside by the City through Council resolution or bylaw to save in advance of future expenditures. These funds can be used to invest in infrastructure. Some of the reserve funds are general purpose with the ability to help more than one service like the Federal Gas Tax Reserve Fund (Table 7). Others are earmarked for specific uses such as future investments required on the Dearness Home facility. Although reserve fund balances are not sufficient to fund all capital asset

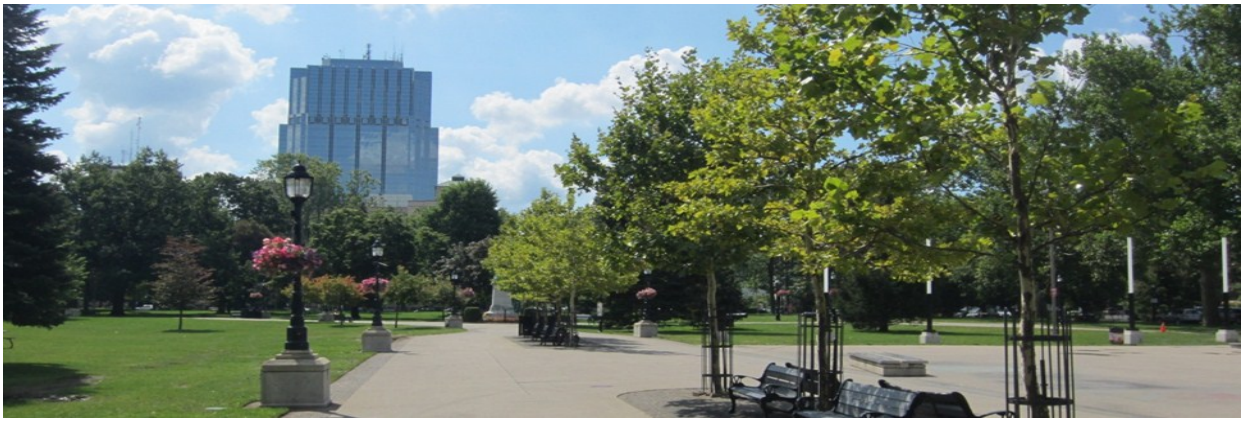
renewal and replacement projects required over the next ten years, this source of funding can be used as tool to reduce portions of the infrastructure gap. These specific Reserves/Reserve Funds, where they pertain, have been considered in the infrastructure gap analysis presented in each service area section. They are applied in the analysis under the conservative assumption that the total amount saved in the reserve fund is used to fund life cycle activities; in effect reducing the infrastructure gaps within specific service areas. In practice however, while some reserve funds are this specific in their application, other reserve funds assigned primarily for life cycle activities are in fact used to fund all types of activities (life cycle, growth and service improvement) within the City's capital budgets.

Table 7 - General Purpose Reserves (000's)

	Actual Balance 31-Dec-12	<----------Projected Balance ---------->				
		2013	2014	2015	2016	2017-2021
Facilities - City	$9,957	$15,656	$18,368	$20,287	$24,985	$44,874
Federal Gas Tax	$16,731	$13,254	$3,331	$3,398	$3,466	$7,780
TOTAL	**$26,688**	**$28,910**	**$21,699**	**$23,685**	**$28,451**	**$52,654**

Under the City's pay-as-you-go financial management practice it is necessary to accumulate savings in advance of making investments. This helps the City avoid increased borrowing rates, passing costs to future generations and not addressing the funding requirements of future liabilities. Failure to maintain stable financial performance has negative effects such as the potential loss of London's Aaa credit rating, which would lead to being charged higher interest rates on borrowing.

The Reserves and Reserve Funds included in this report are capital asset life cycle renewal and replacement reserve funds that can be applied to the specific service areas discussed in this report. They do not include Reserves or Reserve Funds that the City holds for purposes other than renewal such as obligatory reserves, growth reserves, or the contingencies/stabilization and risk management reserves.



Picture 12 Victoria Park

Data Reliability and Accuracy Rating

To aid interpretation, a Data Accuracy and Reliability rating is noted in the conclusion section of each service area chapter (Figure 5). The Data rating scales are defined below in Table 8.

Figure 5 - Reliability and Accuracy Scale

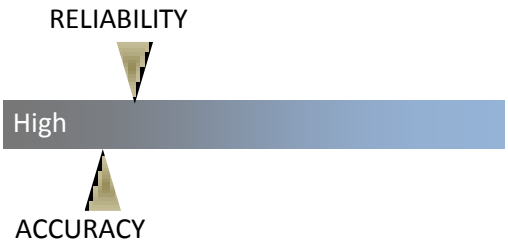


Table 8 - Reliability and Accuracy Scale and Definitions

Measure	Description	High	Moderate	Low
Reliability	Can be trusted to be accurate or to provide a correct result	Based upon sound records, procedures, or analyses that have been acceptably documented, and are recognized as the best method of assessment	Based upon known reasonable procedures, or analyses that have been acceptably documented	Based upon expert verbal opinion or cursory inspections/ observations
Accuracy	Probable difference between a recorded parameter and its true value	+/- 1%	+/- 20%	+/- 50%

Picture 13 Riverside Park Multi-use Pathway

Picture 14 Uplands Pedestrian Footbridge

Picture 15 - City Hall Northwest Corner and Steps to Reg Cooper Square

Current State of City of London Infrastructure Overall Results

Picture 16 King Street Pedestrian Bridge

City of London Infrastructure Summary			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$ 10.9 Billion		**$ 52.1 Million**	**$ 466.1 Million**

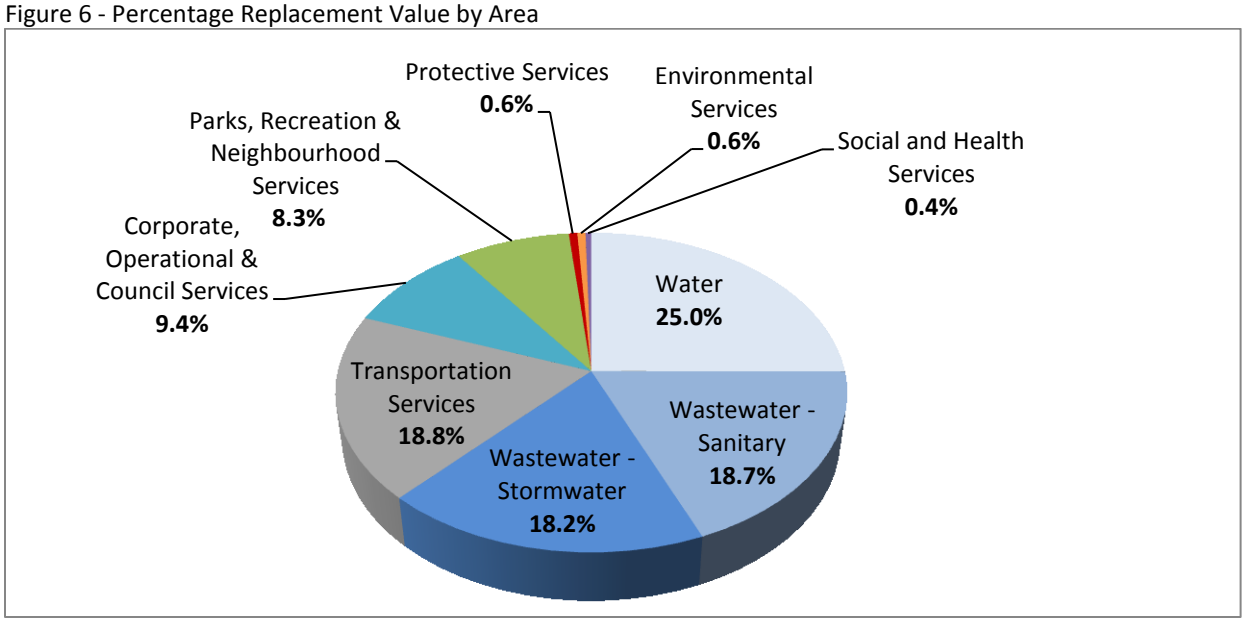
What Do We Own? What is it Worth?

This report addresses assets directly owned and operated (core infrastructure) by the City of London. These assets have a current replacement value estimated at **$10.9 Billion**. About 62% of this total comes from the value of the conveyance and treatment facilities required to deliver Water, Wastewater - Sanitary and Stormwater Services to the citizens (Figure 6). Transportation Services, which include roads, bridges, traffic lights & signals and parking account for about 19% of the total replacement value. Parks, Recreation & Neighbourhood Services, and Corporate, Operational & Council Services contribute approximately 17% of the total replacement value. Environmental Services (Solid Waste), Social and Health Services (Dearness) and Protective Services (Fire) account for less than 2% of the total replacement value. The asset values are reflective of the size of the asset base of each Service Area and do not represent the actual value of the services provided to the citizens, which are all important. The total replacement value presented does not include assets owned and operated by Boards and Agencies such as Police, Library, London Transit Commission, etc.

Table 9 - What do we own? - Highlights

Asset	Inventory	Unit
Water Main	1,570	Km
Sanitary Sewer	1,430	Km
Wastewater Treatment Plants	6	Ea.
Storm Sewer	1,304	Km
Stormwater Management Pond	75	Ea.
Road	3,717	Lane Km
Bridge	101	Ea.
Sidewalk	1,471	Km
Park Land & Natural Area	2,436	Ha
Pathway & Trail	206	Km
Trees (ROW, Park, Woodlot)	1,026,623	Ea.
Arena	11	Ea.
Aquatic Facility	40	Ea.
Community Centre	13	Ea.
Fire Station	14	Ea.

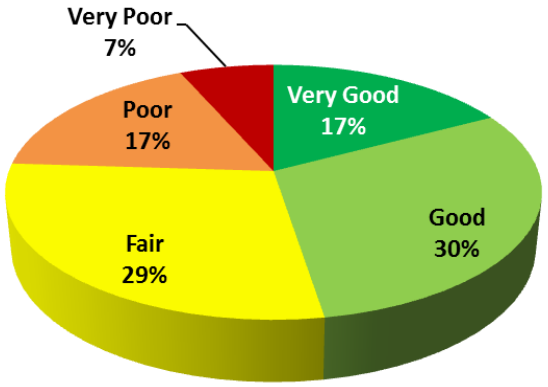
Figure 6 - Percentage Replacement Value by Area



What Condition is it in?

This report uses a combination of methods to determine the condition presented. Some assets undergo routine formal condition assessments. However for a large part of the asset base, condition has been derived from age and expected useful life information.

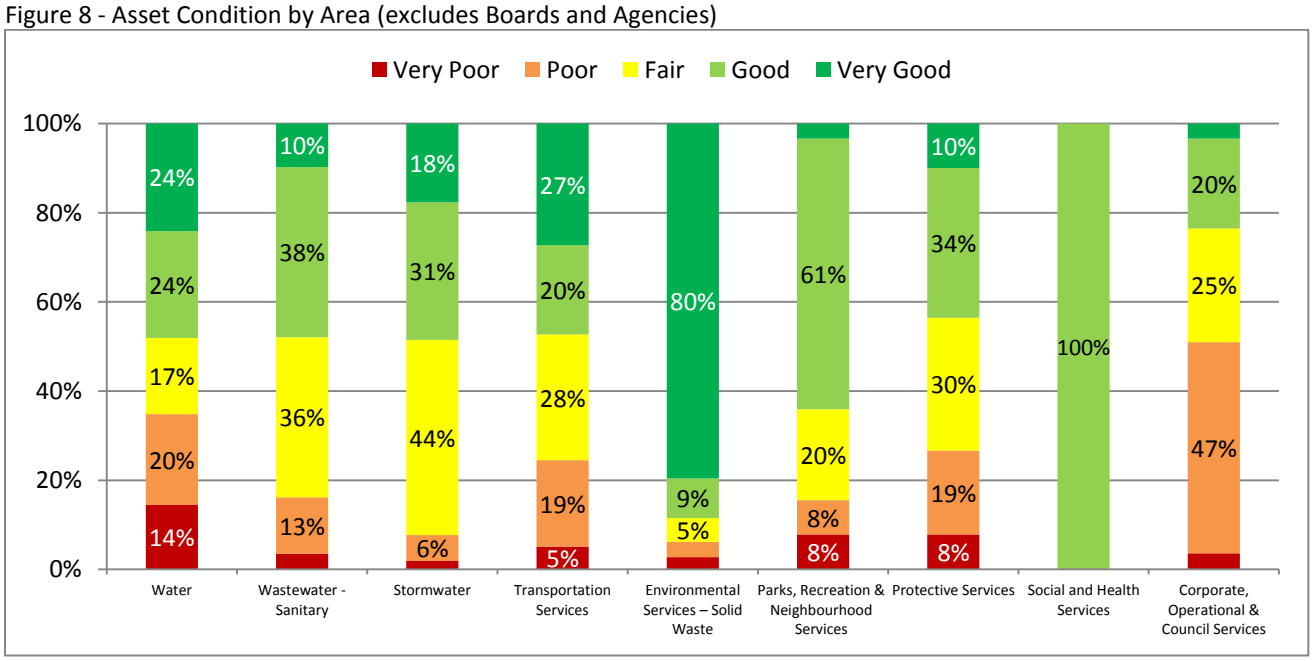
Figure 7 – Overall Asset Condition by Replacement Value



The overall condition of the City of London's core infrastructure is rated **Fair** to **Good** (Figure 7) indicating that some assets are showing general signs of deterioration and require attention. Some assets are exhibiting significant deficiencies that require more immediate intervention. Roughly 50% of the City's core infrastructure value is rated in Good to Very Good condition, fully functional and well placed to support service delivery into the future.

Illustrated in Figure 8, assets operated by Water, Wastewater – Sanitary and Stormwater Services are rated as Fair to Good. Transportation Services (Roads, Bridges, Traffic and Parking) and Protective Services (Fire) are overall in Fair condition. Parks, Recreation & Neighbourhood Services (Parks, Recreation and Urban Forestry) are rated Fair to Good. Assets operated by Environmental Services - Solid Waste (Solid Waste Collection, Disposal and Recycling) are in Good to Very Good Condition. Health & Social Services (Dearness Home) is also in Good Condition. Assets supporting Corporate, Operational and Council Services (Facilities, Fleet, ITS) are in Fair to Poor condition, largely due to the condition of City Hall which is rated in poor condition.

Figure 8 - Asset Condition by Area (excludes Boards and Agencies)



Attention should be focused on the bands of red and orange in Figure 8 which reflect the areas of greatest need. For example, at the end of 2012 19% of Transportation's assets were evaluated as being in Poor condition while 5% were shown to be in Very Poor condition. This reflects an area in need of investment. Roads are still open but risks are higher that Poor road condition will lead to increased potholes, vehicle damage, slower speeds, longer commute times, greater gas consumption, etc.

The findings in this report are consistent with the Canadian Infrastructure Report Card regarding municipal infrastructure across Canada meaning that in general, London shares the issues faced by the rest of the country (Table 10).

Table 10 - Infrastructure Condition - London Compared to the Canadian Infrastructure Report Card

Service Area	2012 Canadian Infrastructure Report Card	2012 London State of Infrastructure Report
Water	Good	Fair to Good
Wastewater - Sanitary	Good	Fair to Good
Stormwater	Very Good	Fair to Good
Roads	Fair	Fair

Picture 17 - Dingman Road Pump Station

What Do We Plan to Spend Versus What We Need to Spend? What is the Gap?

Over the next decade the City of London projects spending over $1 Billion[2] to address the life cycle needs of its core assets. This level of investment will result in an infrastructure investment gap of roughly **$466.1 Million** over the next decade (Table 11). This analysis reveals that the current infrastructure gap is approximately **$52.1 Million**. If taxation and utility rates were the only source of funding, eliminating the infrastructure gap would translate to each London household needing to contribute an additional $306 now to address the current $52.1 Million or $207[3] each year for the next 10 years to address the growth of the infrastructure gap. This equates to a sacrifice of less than a cup of coffee a day. These amounts would also be reduced through use of other funding sources such as increased user fees, debt and transfers from upper tier governments or changing service levels to match available funding.

Table 11 - Current and Future Infrastructure Gap

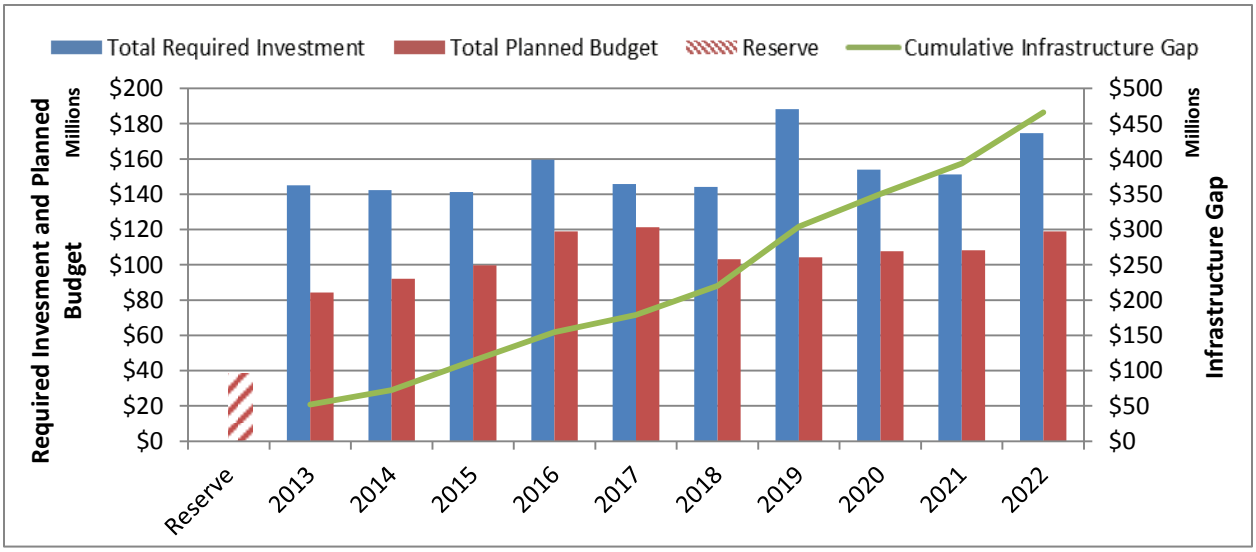
Program Area	Service Area	Replacement Value ($000's)	Infrastructure Gap	
			Current ($000's)	In 10 Years ($000's)
Water, Wastewater Services	Water	$2,734,373	$1,941	$37,800
	Wastewater - Sanitary	$2,043,409	$0	$21,802
	Stormwater	$1,993,151	$0	$973
Transportation Services	Roads & Structures	$1,832,115	$26,705	$236,165
	Traffic	$214,937	$6,856	$35,474
	Parking	$5,694	$0	$0
Environmental Services	Solid Waste	$64,237	$0	$5,142
Parks, Recreation & Neighbourhood Services	Recreation	$246,832	$0	$7,314
	Parks	$141,358	$4,990	$43,763
	Urban Forestry	$513,300	$637	$9,070
Protective Services	Fire	$66,156	$0	$0
Social and Health Services	Long Term Care	$45,593	$0	$2,562
Corporate, Operational & Council Services	Corporate Facilities	$149,532	$9,589	$55,199
	Culture Facilities	$31,471	$0	$0
	Fleet	$44,994	$0	$0
	Information Technology	$46,100	$1,342	$10,867
	Land	$751,890	$0	$0
Total		**$10,925,142**	**$52,060**	**$466,131**

The infrastructure gap (Figure 9) represents the amount of investment today that would be required to address the risk represented by assets nearing the end of their estimated useful lives. These needs do

[2] Approved 2013 Water, Wastewater and General capital budgets
[3] Assuming a 5% discount rate over 10 years with payments received at the beginning of each year.

not include allowances for growth, inflation or service improvements. Based on current funding plans the infrastructure gap is projected to grow steadily over the next decade. The major contributors to this increasing infrastructure gap are insufficient planned investments in the Roads and Structures, Corporate Facilities, Parks, Water, Traffic and Wastewater-Sanitary service areas.

Figure 9 - City of London Infrastructure Gap Projection



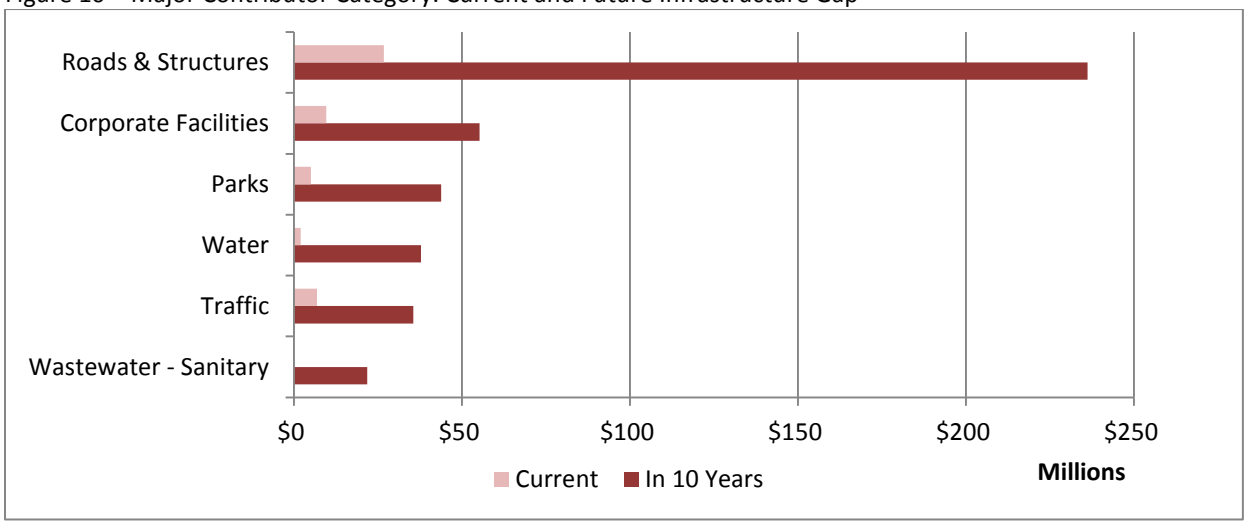
The City can attempt to address both the current and projected infrastructure gaps by focusing efforts on areas that contribute the largest portions of the projected 10 year infrastructure gap. Table 12 summarizes service area infrastructure gaps by dividing the service areas into three separate categories that reflect their contribution to the projected 10 year infrastructure gap in order of significance.

Table 12 – Infrastructure Gap Contribution Categories

Category	Contribution to the Infrastructure Gap	Service Areas
Major Contributors	This group have gaps of greater than $20 Million in the next 10 years.	Roads and Structures Corporate Facilities Parks Water Traffic Wastewater (Sanitary)
Minor Contributors	This group includes those areas estimated between $5 and $20 Million gap in 10 years.	IT Urban Forestry Recreation Solid Waste
Non- Contributors	These areas have less than an estimated $5 Million gap in 10 years.	Long Term Care Stormwater Parking Fire Culture Facilities Fleet

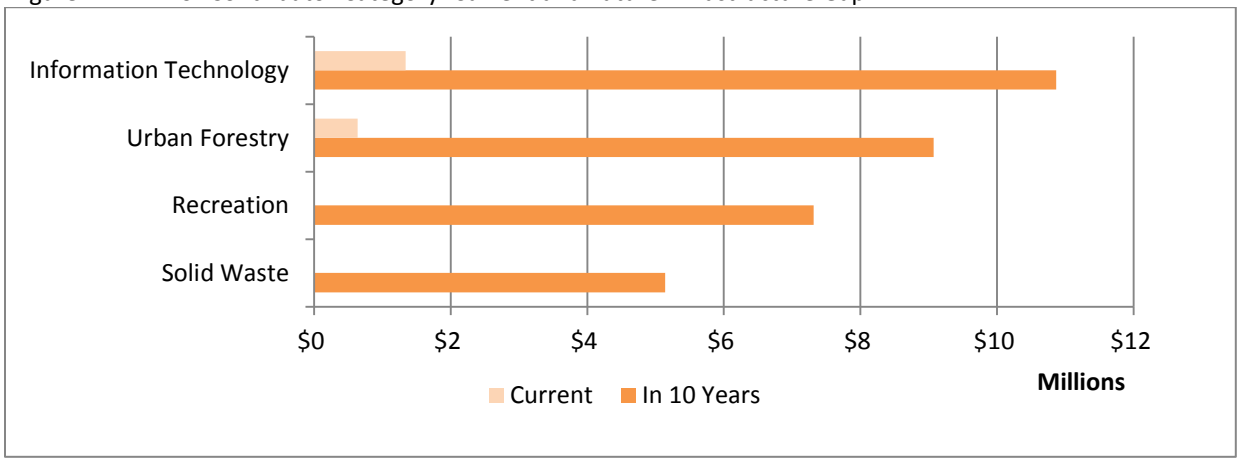
The Major Contributor category includes service areas having projected infrastructure gaps greater than $20 Million (Figure 10). They contribute approximately 92% ($430 Million) of the total 10 year infrastructure gap. The largest single service area infrastructure gap is attributed to Roads and Structures which constitutes over 50% of the 10 year total. According to current budget projections and without specific measures put in place or additional funding, these service areas will experience severe funding shortages that will impact their asset base, likely resulting in degradation of the services delivered to the citizens, and may become unmanageable or extremely costly to address. Further details on impact of the infrastructure gaps can be found in the service area sections.

Figure 10 – Major Contributor Category: Current and Future Infrastructure Gap



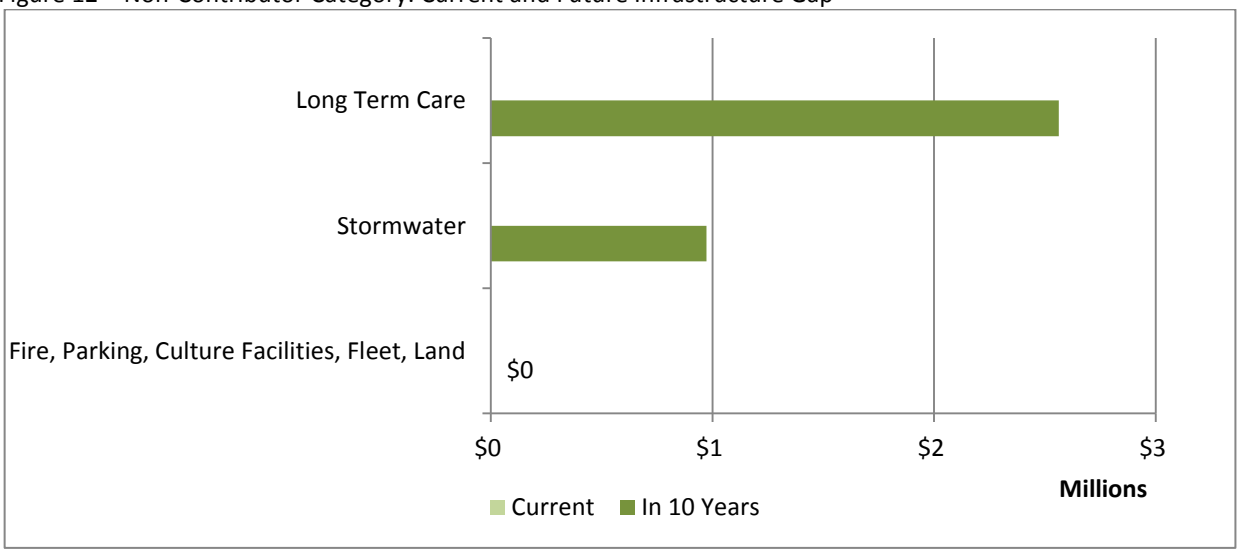
The Minor Contributor category includes service areas having projected infrastructure gaps between $5 Million and $20 Million (Figure 11). They contribute approximately 7% ($32 Million) of the total 10 year infrastructure gap. While these Service Areas will have funding shortages according to current budget projections, the smaller gaps are more easily mitigated and make it possible to limit impacts on the quality and reliability of the assets used to deliver services to the citizens.

Figure 11 – Minor Contributor Category: Current and Future Infrastructure Gap



The Non-Contributor category includes service areas having projected infrastructure gaps less than $5 Million (Figure 12). They contribute approximately 1% ($4 Million) of the total 10 year infrastructure gap. According to current budget projections these service areas will experience minimal or no infrastructure gap over the next decade illustrating that their asset needs are adequately funded.

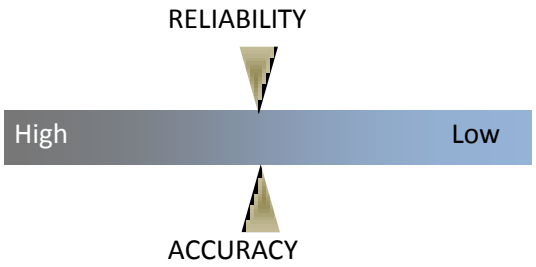
Figure 12 – Non-Contributor Category: Current and Future Infrastructure Gap



Data Reliability & Accuracy

Although the City generally has good information on its asset inventory this report uses estimates and assumptions where necessary particularly regarding condition information. Conservatively the overall reliability and accuracy (Figure 13) of the data presented in this first State of Infrastructure Report is assessed as **Moderate** (+/-20%). This means the actual current infrastructure gap likely falls between $42 and $62 Million while the actual 10 year infrastructure gap likely falls between $373 and $559 Million.

Figure 13 – Overall Reliability & Accuracy Results



This report represents the accumulation of best available data prior to the implementation of the Corporate Asset Management Program. At the current time, asset management practices throughout the City vary greatly in terms of their maturity. Due to the variety of practices surrounding management of the City's infrastructure and the data quality that supports these management efforts, the findings of this report are not immune to limitations. Much of the data accumulated to produce this report is based upon reasonable, acceptably documented, procedures and the City's major data repositories in JD Edwards and GeoDatabase. Where data was not available expert opinion of City staff was used; primarily in the production of condition ratings but also to some extent in the inventories presented. Details on individual service area data reliability and accuracy assessments can be found in Appendix 2.

Summary

The concern over an infrastructure gap is not so much that it exists. In fact, maintaining a controlled "gap" is likely indicative of prudent financial management. The City of London's infrastructure was assessed overall as being in **Fair** to **Good** condition. A balance must exist between the amount of preventative and reactive measures used to address infrastructure concerns and how much risk of asset failure is tolerable. At the time of this writing, in Canada, there is no standard or guidance to evaluate what is, or is not, an acceptable municipal infrastructure gap. In London's situation a $52.1 Million infrastructure gap compared to a $10.9 Billion asset base could be considered well managed. The City of London is widely regarded for its water quality, recreation facilities, inter-connected network of parks, etc. Not to be overlooked the City of London has also received a Aaa credit rating for 37 consecutive years; an illustration of its prudent financial management practices. The concern with the analysis presented in this report is that the current infrastructure gap is projected to significantly increase over the next 10 years; indicating that projected investment in asset life cycle initiatives does not sufficiently address the needs of our current infrastructure.

Picture 18 - Springbank Park Wooden Stairs

Service Area Results

Section 1: Water and Wastewater Services

Picture 19 Southeast Reservoir Construction

Picture 20 Greenway WWTP Section 1 Final Clarification 2

Section 1: Water and Wastewater Services

Water

The City of London supplies safe, clean, high-quality water to the residents and businesses of London. This involves managing a reliable water system capable of providing sufficient quality, flow and pressure to satisfy drinking, recreational, irrigation, sanitary, fire protection, and business needs. Treated drinking water is purchased from the Lake Huron and Elgin Area Water Supply Systems which draw water from Lake Huron and Lake Erie respectively. Drinking quality water is pumped from the treatment plants at each lake into the City where it is distributed and metered to all the water customers while meeting pressure, flow and quality standards. This requires an extensive network of infrastructure valued at approximately $2.7 Billion which is operated and maintained by the City of London.

LONDON DELIVERS ENOUGH WATER THROUGH THE TAPS THAT EVERY SINGLE ONE OF OUR OVER **360,000** LONDONERS COULD MAKE MORE THAN **200** BOXES OF KRAFT DINNER EACH AND EVERY DAY…

Asset Inventory & Valuation – Water

Table 13 - Asset Inventory & Valuation – Water[4]

Asset Type	Asset		Inventory	Unit	Replacement Value ($000's)
LINEAR	Transmission Mains (> 450 mm)		206	km	$1,946,540
	Distribution Mains (< 450 mm)		1,364	km	
	Appurtenances	Service Connections	110,944	Ea.	$277,360
		Valves	11,057	Ea.	$164,410
		Hydrants	8,637	Ea.	$91,421
		Chambers	695	Ea.	$44,027
		PRV	10	Ea.	$2,024
	Water Meters		110,944	Ea.	$ 33,110
FACILITIES	Pump Stations (incl. Re-chlorination)		7	Ea.	$ 61,576
	Storage Reservoirs		3	Ea.	$ 58,800
	Wells		7	Ea.	$ 105
Facilities Under Construction	SE Reservoir		1	Ea.	$ 55,000
	SE Pumping Station		1	Ea.	
TOTAL					$2,734,373

[4] Note that administrative, maintenance and storage buildings are maintained by the City's Facilities group. Fleet and associated equipment is provided and serviced by Fleet Management Services and are dealt with in the Fleet section. Land is also excluded from this asset pool and dealt with in the Land section.

The water infrastructure is grouped into Water Linear (pipes, appurtenances and meters) and Water Facilities. Water assets are managed and maintained to meet provincial drinking water quality requirements. Along with City of London technical targets for performance and reliability, the utility adheres to its accreditation requirements through the Council-endorsed Drinking Water Quality Management Standard - Operational Plan.

Water Linear assets are the largest of the inventory categories and include the pipes, appurtenances like valves, chambers, fire hydrants and meters. Continual preventative maintenance programs are performed on the water distribution network, with watermain renewal targeted based on break rate.

Special programs exist to deal with specific water situations, like the failure of the cast iron pipe inventory. Internal cleaning and lining, optimized water chemistry, and external corrosion mitigation methods are used to minimize failures. By following the 20 Year Water Financial Plan, the majority of the cast iron water mains will be renewed by the mid to late 2030's and cast iron breaks will be substantially eliminated.

Picture 21 Fire Hydrant Removal

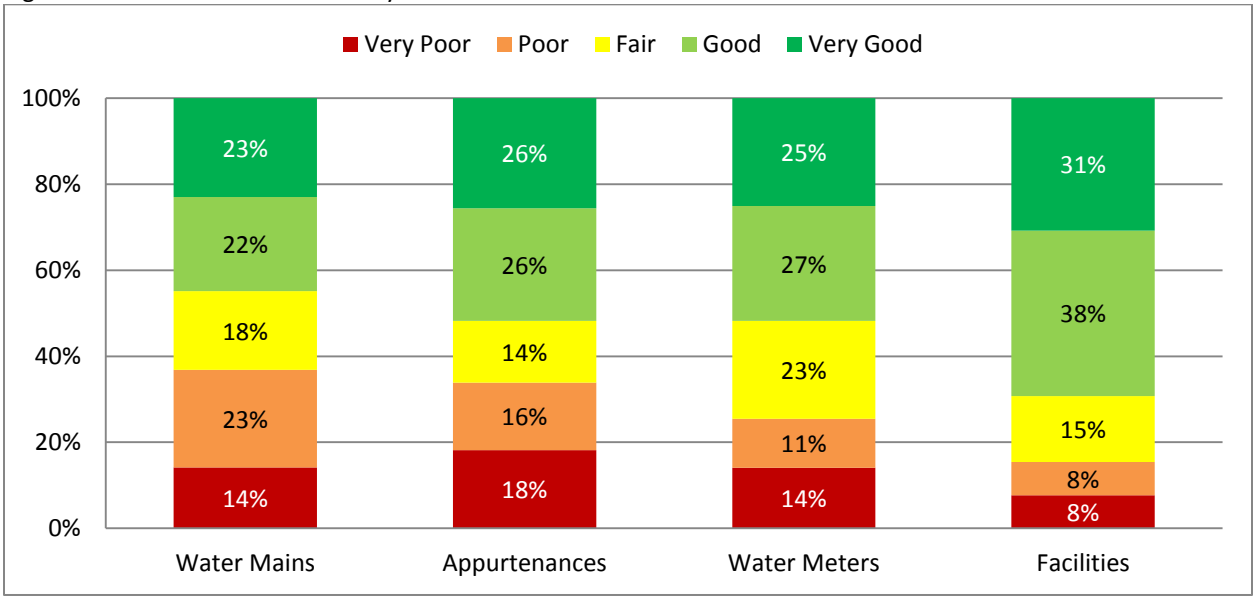
London maintains an annual cleaning and lining program based on need and available resources. A pipe will be replaced when it can no longer be rehabilitated, has met the end of its useful life, has a repetitive break history, does not have capacity to support revitalization/growth, or has been included in a capital works improvement wherein a compilation of other prioritized needs are identified. London uses a variety of monitoring techniques including sound studies to check for leaks, an on-line permanent monitoring system of large diameter concrete pipe to provide pre-emptive warning of potential catastrophic pipe failure, and a fully alarmed Supervisory Control and Data Acquisition (SCADA) system to continually monitor the distribution system's performance.

Water Meters are planned for replacement through an accelerated program at approximately 12,000 meters per year in order to eliminate the backlog of meters that have exceeded their useful life, and achieve a level of sustainability. The inventory of remote reading meters is relatively young but ever-increasing, recently becoming standard installation hardware. They are checked, recalibrated, and/or replaced based on manufacturer recommendations.

Water Facilities include pump stations, storage reservoirs and a few backup wells. These facilities are assessed on an individual and planned basis through a mix of normal maintenance and engineering studies. This asset group includes the new Southeast Reservoir and Pump Station that is nearing completion.

Asset Condition – Water

Figure 14- Asset Condition Summary – Water [5]



Asset conditions have been established using data from the City's Tangible Capital Asset database for age and expected useful life, the 2013 RVA Water Main Renewal Plan and expert opinion.

Over 60% of the City's linear **Water Main** assets are in **Fair** to **Very Good** condition, with the remainder approaching the end of their expected useful lives, indicating a need for investment in the short to medium term. The 2013 RVA Water Main Renewal Plan suggests that continuing focus on the renewal of cast iron mains is necessary to meet the City's service goals.

Appurtenances are in slightly better condition with a similar investment requirement timeline.

The bulk of the City's **Water Meters**, 75%, is in **Fair** or better condition and managed to ensure integrity and sustainability of the billing process.

Based on a combination of expert opinion and historical capital investments, over 80% of the **Water Facilities** (pump stations, storage reservoirs and wells) are rated in **Fair** to **Very Good** condition. The Springbank Reservoir complex is assessed every five years with the latest results reflecting the reservoir in Good condition. Four of the City's seven Pumping Stations have been constructed since the year 2000 while older stations have received significant improvements. In the short term the Arva and

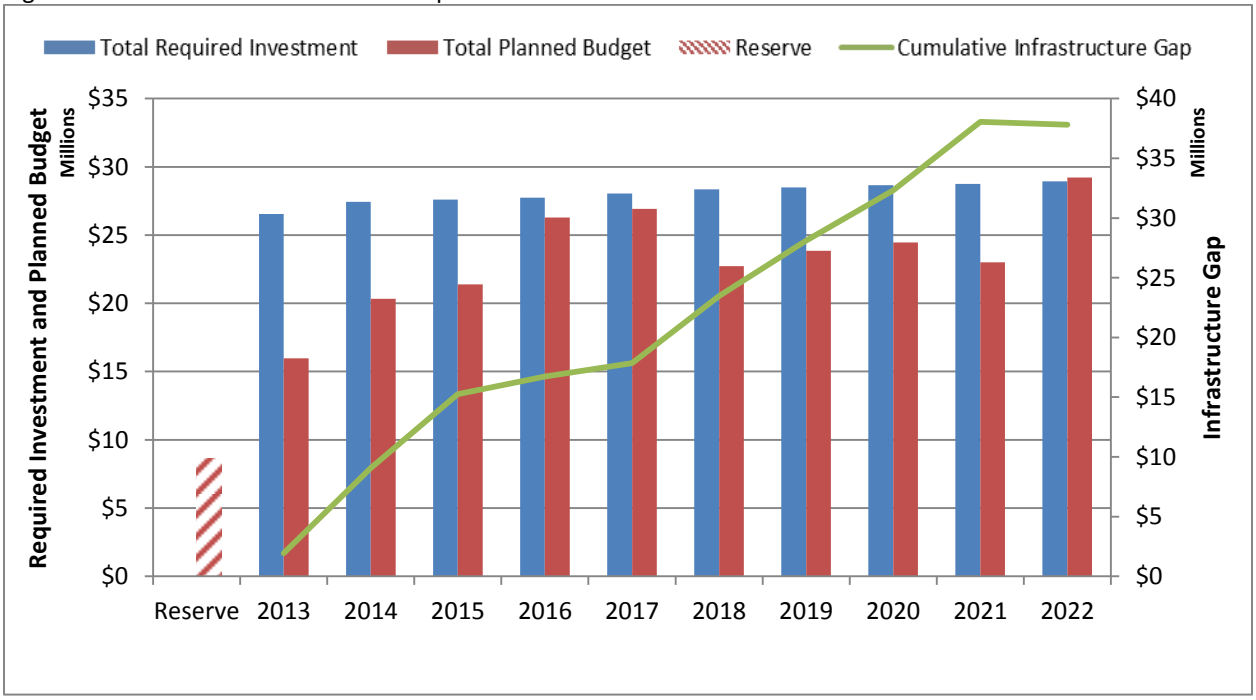
Picture 22 Co-existence of Trees & Water Infrastructure

[5] The infrastructure is rated per Kilometer of main and per unit in the remaining categories.

Springbank Pumping Stations may need attention due to their currently high use. Age is not a good indicator of condition for pumping stations as it does not reflect their complexities, which allow staff to repair or replace components without renewing the entire facility. A more thorough assessment and a long-term management strategy are required to improve our understanding, and level of detail, surrounding the condition and future needs of pumping stations.

Forecasted Infrastructure Gap – Water

Figure 15 - Forecasted Infrastructure Gap – Water



Evaluating planned budget vs. required investment shows that the Water infrastructure gap will steadily increase to approximately $38 Million over the next decade. Total required investment represents the costs to renew and maintain the existing assets so services can continue to be delivered. The estimate does not account for any costs to improve service (e.g. water pressure, reliability, aesthetics), accommodate growth or expand service to new areas or customers.

The largest portions of the infrastructure gap in Water are represented by future requirements in pipes and service connections. The required investment for pipes with the exception of service connections in the ten year period is derived from the 2013 RVA Water Main Renewal Plan. The required investment for service connections and facilities assumes that assets identified as being in poor or very poor condition will need renewal over the next 20 years. The infrastructure gap increases over time due to ductile iron replacement needs and other pipe groups reaching the end of their expected useful lives. For example, water pipes installed in the 1930's through the 1970's are all failing. The 1950's through 70's pipe is failing at a much higher rate than those installed in the 1930's. Cast iron pipe is failing at a higher frequency every year. Lead service connections need to be replaced. The City has already implemented proactive management techniques like targeted renewal, acoustic fibre optic monitoring,

condition assessment, lining, cathodic protection, etc. to optimize management of the water assets. Further use of these technologies will help mitigate the gap over the long term.

During the 2013 Water budget approval process a new "Value of Water" funding model (Rate Structure Review) was initiated. Administration recommended 8% rate increases in 2013 through 2015, 7% in 2016, 6.75% in 2017, and a return to the rate of inflation thereafter. With these changes the Water Service Area intends to address the effects of declining consumption, increased wholesale water costs, inflation, non-revenue water loss and the addition of new revenues sources to reach financial and rate stability by 2018. This is consistent with the principles of the 20 Year Water Financial Plan that confirms a commitment to full cost recovery, financial stability and closing the water infrastructure gap (not necessarily in the ten year period), while achieving sustainability of the system in the years to come. The plan is a commitment to continue renewing infrastructure as it approaches the end of its useful life, prior to failure, thereby minimizing maintenance and repair costs, social disruption and water loss. The future projected rate increases will be used to address infrastructure that requires significant renewal (replacement and rehabilitation) work to close the infrastructure gap ensuring that future generations and businesses are not faced with a water system that is failing, unreliable and expensive to maintain. The 20 Year Water Financial Plan includes allowances for growth and inflation while closing the infrastructure gap over several decades. This State of Infrastructure Report uses a 10 year period to study the infrastructure gap. The results of this report reflect an initial increase in the Water infrastructure gap which the 20 year plan resolves over several decades.

Financial stability should not be confused with infrastructure sustainability. The Water service area hopes to achieve financial and rate stability by 2018. The City has a historic practice of deferring renewal efforts due to budget limitations contributing to the infrastructure gap. Success of the 20 Year Water Financial Plan will be determined through monitoring. However the plan will also need to be flexible to address the myriad of changes that will occur over time.

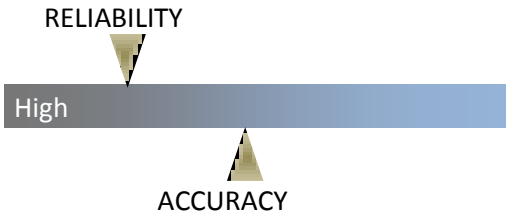
This State of Infrastructure Report assumes two Water reserve funds currently used for life cycle renewal projects are dedicated in their entirety to mitigate the infrastructure gap. In reality, these reserve funds are also used to smooth fluctuations resulting from actual revenues/expenditures, fund growth and service improvement projects, as well as protect against emergencies and other unplanned events.

Picture 23 Sunningdale Water Pumping Station

Conclusion – Water

Valued at roughly $2.7 Billion, the City's water assets are overall in **Fair** to **Good** condition, indicating that they meet current needs, but are aging. Failure to address the infrastructure gap could result in localized reductions to service. These may include increased break frequency, localized service outages, increased maintenance costs on assets past their optimal life, increased water quality concerns due to changes in flow patterns, etc. The infrastructure gap suggests that condition and funding need to be monitored and asset requirements addressed in order to continue to deliver high quality service to the London community. The 20 Year Water Financial Plan demonstrates an existing commitment to continue renewing infrastructure as it approaches the end of its useful life.

City of London Water Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$ 2,734,373,000		**$ 1,941,000**	**$ 37,800,000**



Picture 24 Historic Wooden Watermain

Regional Water

The City of London receives its water from two regional water systems over which the City plays a significant management role. The City is the largest single customer on each regional water system, has been designated as the "Administering Municipality" under the direction of the respective Board of Management for the regional water system, and is entitled to appoint members to sit on each of the Regional Water Boards:

- Elgin Area Primary Water Supply System Board of Management
- Lake Huron Primary Water Supply System Board of Management

The Boards each govern their respective water treatment and transmission system that serve approximately 460,000 people across 5,000 square kilometers of the greater London area of south western Ontario; from Bayfield, Grand Bend and Ipperwash along Lake Huron, to Iona, Port Stanley, and Port Burwell on Lake Erie, and most areas in between. The water systems are currently operated and maintained by the Ontario Clean Water Agency (OCWA) under contract to the respective Board. The Boards maintain overall ownership and control over the assets, capital construction, system growth, and the long-term development of the system. As the Boards' assets are not owned by the City of London, they and any associated infrastructure gap are not reported on in this report.

The Lake Huron Primary Water Supply System services the municipalities of London, Lambton Shores, North Middlesex, South Huron, Bluewater, Middlesex Centre, Lucan-Biddulph and Strathroy-Caradoc from a water treatment plant located north of the village of Grand Bend in South Huron. The plant has a current rated treatment capacity of 340 Million litres per day (75 Million Imperial gallons per day) and serves a population of approximately 350,000 people.

The Elgin Area Primary Water Supply System services the municipalities of St. Thomas, London, Aylmer, Bayham, Central Elgin, Malahide and Southwold from a water treatment plant located east of the village of Port Stanley in Central Elgin. The plant has a current rated treatment capacity of 91 Million litres per day (20 Million Imperial gallons per day) and serves a population of approximately 112,000 people.

Because the two area water systems are inter-connected through the City of London, the Lake Huron Water Supply System can supply water to the Elgin Area Water Supply System in the event of an emergency. However, the connecting piping within the City boundaries is directly owned and managed by the City of London and included in the Water section of this report.

Picture 25 Regional Water System Map

Picture 26 Adelaide Wastewater Treatment Pumps

Section 1: Water and Wastewater Services

Wastewater – Sanitary

The City of London protects its citizens and the natural and built environments through the management and treatment of the City's sanitary sewage. The sanitary system is designed to collect and treat residential, commercial and industrial wastewater. Sanitary sewers carry wastewater from homes, commercial buildings and industrial sources to one of six wastewater treatment plants designed and operated to meet strict provincial standards. Treated water outlets to the Thames River.

IF THE CITY TRUCKED OUR YEARLY VOLUME OF SEWAGE USING THE LARGEST TANK TRUCKS AVAILABLE, THE BUMPER TO BUMPER CONVOY WOULD REACH FROM LONDON THREE QUARTERS OF THE WAY AROUND THE WORLD…

Asset Inventory & Valuation – Sanitary

Sanitary assets are managed and maintained to meet provincially issued system and facility operating permits, as well as City of London technical targets for performance and reliability. Valued at over $2.0 Billion, this extensive network of assets can be grouped into two categories; collection and treatment and further divided into five categories, ranging from local sewers to wastewater treatment plants.

Table 14- Asset Inventory & Valuation – Wastewater – Sanitary [6]

Asset Type	Asset	Inventory	Unit	Replacement Value ($000's)
COLLECTION	**Local Sewers** (< 600mm)	1,268	km	$876,000
	Trunk Sewers (600 - 1200mm)	151	km	$332,816
	Trunk Sewers (> 1200mm)	11	km	$50,892
TREATMENT	**Wastewater Treatment Plants** (Incl. Equipment)	6	Ea.	$702,232
	Pump Stations (Incl. Equipment)	34	Ea.	$81,469
TOTAL				**$2,043,409**

[6] Note that administrative, maintenance and storage buildings are maintained by the City's Facilities group. Fleet and associated equipment is provided and serviced by Fleet Management Services and are dealt with in the Fleet section. Land is also excluded from this asset pool and dealt with in the Land section.

Picture 27 Vauxhall Wastewater Treatment Plant

Collection assets represent the largest component of the wastewater system inventory, and include pipes, manholes, fittings and related equipment. These undergo regular maintenance and inspection. Video inspections (CCTV) identify problems and blockages. Where possible, existing assets are rehabilitated using trenchless technologies at a fraction of the cost of traditional practices. This also reduces social impact. Aside from extending service life by a minimum of 50 years, trenchless technology also reinstates initial design functionality and capacity. Re-lining, a trenchless technology, is planned for all applicable City sanitary pipes older than 100 years by the end of 2013.

Treatment assets include the City's six water **Wastewater Treatment Plants**, and their related equipment, including treatment train components (e.g. screens, clarifiers, disinfection units, etc.). Also included in the treatment category are wastewater **Pumping Stations**, which although they do not treat sewage, share many similar equipment type assets, and are operated and maintained by the plants. Pumping stations are fixed facilities dispersed throughout the collection system. Treatment assets and equipment undergo extensive operations and maintenance regimes to sustain their reliable operation. Investment needs are identified and coordinated with normal operations to minimize disruptions to service. Major replacements are planned and accommodated using system redundancy and changes to operations, in order to maintain service. It is critical to maintain sanitary service in order to protect public health and the environment. Technology and requirements change rapidly in the treatment industry. For example, the City plans to implement centrifuge technology for its bio-solids management in an effort to extend the capacity of the sludge incinerator beyond 2017.

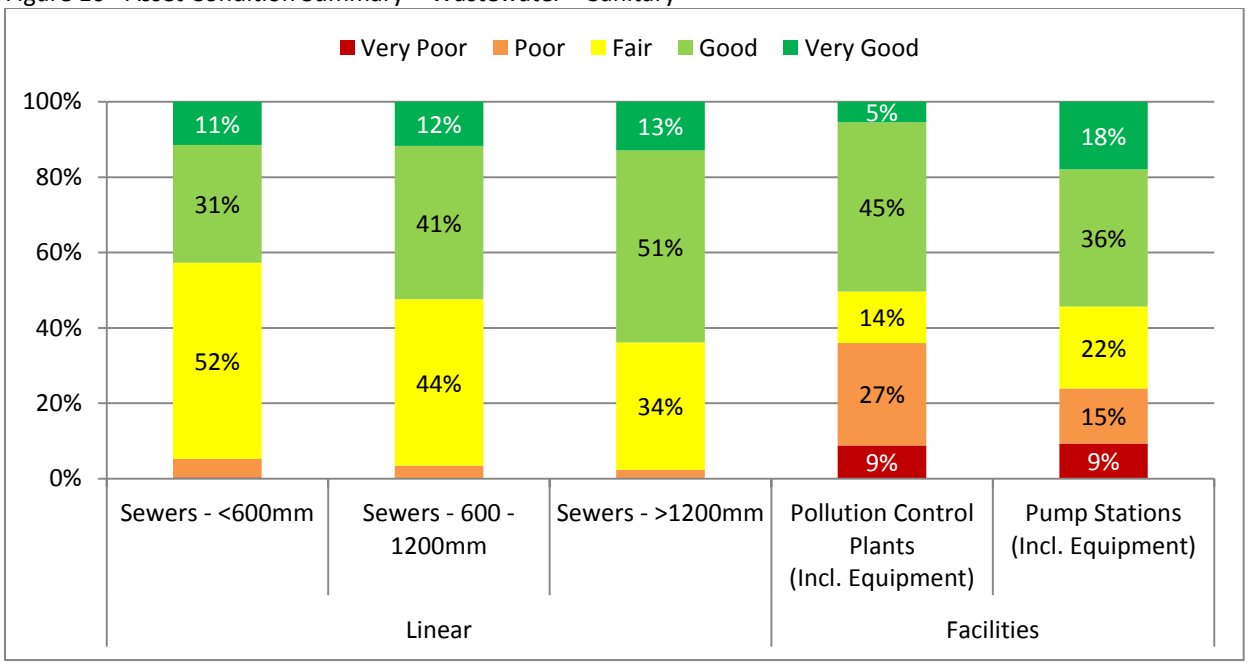
A number of factors will influence the sanitary asset base in the coming years. London is challenged by the need to discharge its treated waters to the Thames River rather than a larger body of water. The limited capacity of the river means that discharge criteria are stringent making treatment requirements more rigorous than for many peer communities in Ontario. Criteria are expected to become even tighter in the future, triggering the

Picture 28 Greenway Section 1 – Crumbling Concrete

need for new ways to treat our sewage. Consumers of water are making progress at minimizing water use in the City which lowers flows to the treatment plants. At the same time, the impacts of climate change may result in varying effects to peak and low flow conditions. Although this report does not address growth, it is noteworthy to remind ourselves that the City itself is also not static and can be expected to grow and need additional sanitary assets. Wastewater treatment plant expansion plans are underway for Greenway. Upgrades are approved for Vauxhall, Adelaide and Pottersburg.

Asset Condition – Sanitary

Figure 16 - Asset Condition Summary – Wastewater – Sanitary

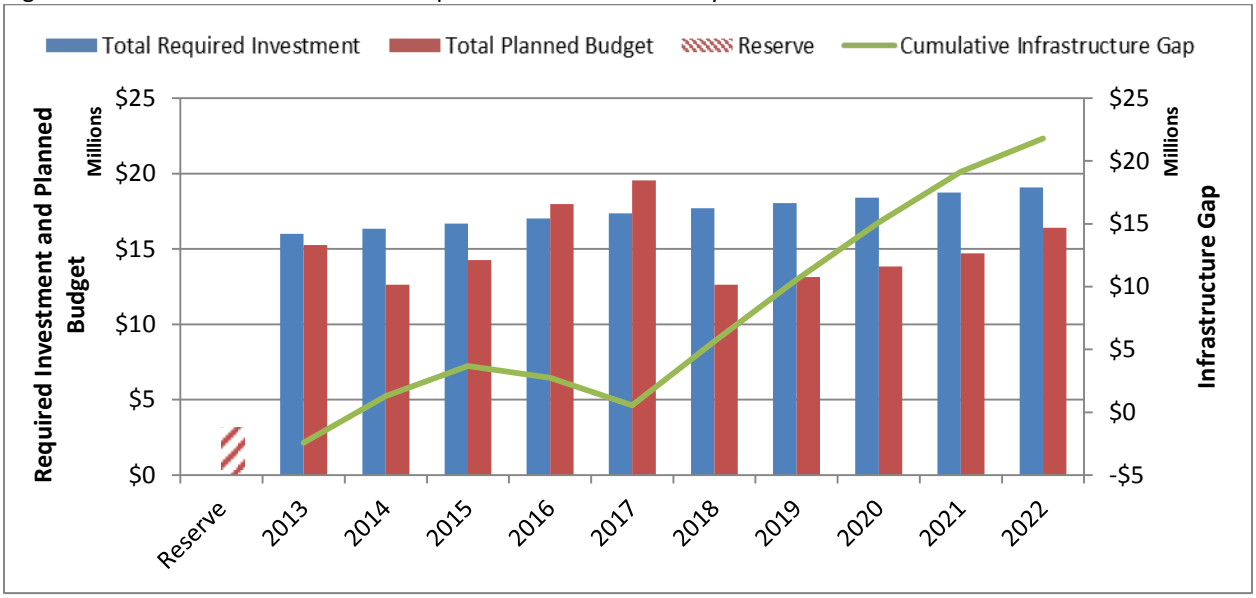


Sewers represent the bulk of the value of the sanitary asset base and are rated in **Fair** to **Good** condition based on information collected from the City's sewer inspection program. Sewers are inspected on a rotating basis and evaluated using a standardized rating system to evaluate the risk of failure and anticipated investment needs. Generally, condition improves with the size of pipe, which is reflective of the longer service life of larger diameter sewers. In 2005, the City published a 20-Year Sewer System Plan which was updated in 2011 and has been used to guide budget development.

Wastewater Treatment Plants and Pump Stations are in **Fair** to **Good** condition based on age and expected useful life. Condition data is not available. However, with respect to capacity, the majority of the treatment plants are currently being operated at the limit of their capabilities. The 2008 Development Charges study update, while targeting growth needs, gives a thorough assessment and long-term management strategies. It could be used to create a framework for improving the understanding, and level of detail, of the treatment plants asset condition and future needs.

Forecasted Infrastructure Gap – Sanitary

Figure 17 - Forecasted Infrastructure Gap – Wastewater – Sanitary



Evaluating planned budget vs. required investments shows that the Wastewater infrastructure gap will grow to nearly $22 Million over the next decade. Total required investment represents the costs to renew and maintain the existing assets so services can continue to be delivered. The estimate does not account for any costs to improve service (e.g. new treatment technology), accommodate growth or expand service to new areas or customers. The trend is equally influenced by collection and treatment assets nearing the end of their expected useful lives over the next 20 years.

For collection and trunk sewer systems the City is addressing its infrastructure needs having implemented proactive management techniques like targeted renewal, regular inspection, condition assessment and the use of trenchless technologies. Further use of these technologies will help control the gap over the long term. For major Wastewater treatment equipment, the infrastructure gap is based on age and expected useful life. The gap increases over time due to replacement needs in major wastewater process equipment and plant facilities as they reach the end of their expected useful lives.

During the 2013 Wastewater budget approval process Administration recommended 7% rate increases in 2013 through 2016, a 4% increase in 2017, and a return to the rate of inflation thereafter. These rate adjustments would enable the sewer system to reach financial and rate stability by 2018; consistent with the principles of the 20 Year Sewer System Plan and coincident with the principles of the 20 Year Water

Picture 29 Wet Well at Sunninghill Pumping Station – Scheduled for Decommissioning in 2013

Financial Plan. With these changes the Wastewater Service Area intends to use the effects of reduced water consumption generating less flow and the future projected rate increases to address infrastructure that requires significant renewal. The 2013 wastewater capital budget addresses needs which have been identified through the sewer inspection program and engineering studies such as the Sanitary and Storm Sewerage Master Plan updates and the 20 Year Sewer System Plan. This 20 Year Sewer System Plan works within the constraints of the debt servicing ratio, gradually increasing the pay-as-you-go funding for life cycle replacement, and slowly growing the reserve funds.

Financial stability should not be confused with infrastructure sustainability. The Wastewater service area hopes to achieve financial and rate stability by 2018. The City has a historic practice of deferring renewal efforts due to budget limitations contributing to the infrastructure gap. Success of the 20 Year Sewer System Plan will be determined through monitoring. The City is also developing a Pollution Prevention and Control Plan to provide a "road map" for the phased implementation of infrastructure projects that will mitigate the impacts of combined sewer overflows and bypasses on the Thames River. This will align with the City's commitment to environmental stewardship and the protection of water resources.

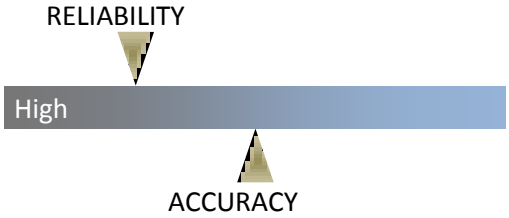
This State of Infrastructure Report assumes the wastewater reserve fund that is currently used for life cycle renewal projects is dedicated in its entirety to mitigate the infrastructure gap. In reality, this reserve fund is also used to smooth fluctuations resulting from actual revenues/expenditures, fund growth and service improvement projects, as well as protect against emergencies and other unplanned events.

Picture 30 Greenway Wastewater Treatment Plant

Conclusion – Sanitary

Valued at over $2 Billion, the City's Wastewater assets are overall in **Fair** to **Good** condition, indicating that they are meeting the City's immediate needs. However detailed condition data is generally limited for sanitary services. Failure to address the infrastructure gap could result in localized and or global reductions to service. These may include blockages, sewer backups, basement flooding, localized service outages, increased maintenance costs on assets past their optimal life, poor quality effluent, damage to the natural environment, fines, etc. The 20 Year Wastewater Financial Plan demonstrates an existing commitment to continue renewing infrastructure as it approaches the end of its useful life.

City of London Wastewater Sanitary Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$ 2,043,409,000		**No Gap**	**$ 21,802,000**



Section 1: Water and Wastewater Services

Wastewater – Stormwater

The City of London protects its citizens and the natural and built environments through the management and treatment of stormwater and drainage. The City's stormwater system aids in preventing flooding by draining rain water away from buildings and roads and controlling the rate of discharge to rivers and streams. The majority of the run-off water from areas developed in recent decades is treated to help remove sediment and pollutants before it outlets to the natural environment. The City also works to protect groundwater aquifers through managing infiltration and being compliant with source water protection laws when considering development approvals.

On average London receives enough precipitation in a year to bury the entire downtown in water to about four times the height of our tallest building, One London Place…

An extensive network of infrastructure and equipment is operated and maintained by the City in order to manage stormwater. Valued at approximately $2.0 Billion, the stormwater infrastructure is broken into two categories, conveyance and management.

The conveyance network divides between closed systems (sewers) where the bulk of the stormwater inventory value lies, and open conveyance such as water courses, municipal drains, channels, dykes. The storm sewers include appurtenances such as catch basins and maintenance holes.

The stormwater management category is divided between facilities (primarily stormwater ponds in London) and smaller treatment equipment such as oil/grit separators and biofilters.

Picture 31 Thames River in Flood Condition

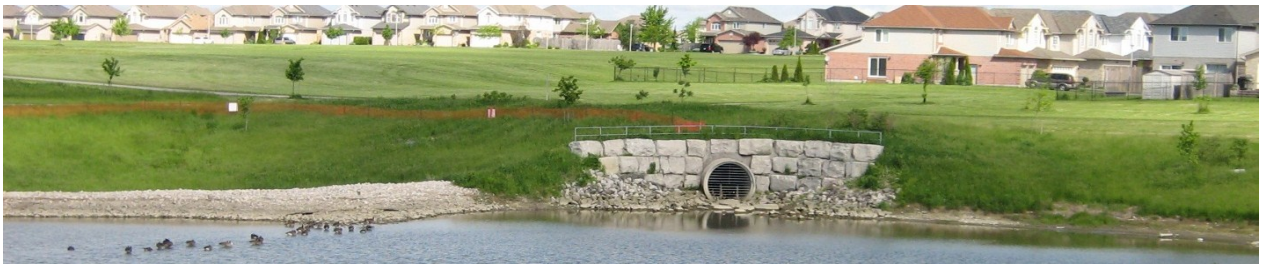
Asset Inventory & Valuation – Stormwater

Table 15 – Asset Inventory and Valuation – Stormwater

Asset Type	Asset	Inventory	Unit	Replacement Value ($000's)
STORMWATER CONVEYANCE SYSTEM	**Storm Sewers**	1,304	km	$1,640,441
	Open Conveyance (Drains, Channels, Dykes)	26	Ea.	$157,552
STORMWATER MANAGEMENT	**Stormwater Management Facilities** (Ponds)	75	Ea.	$193,024
	Minor Treatment (Oil/Grit Separators and Biofilters)	18	Ea.	$2,134
TOTAL				**$1,993,151**

Stormwater Conveyance assets undergo regular maintenance and inspection, which identify proactive and reactive investment requirements. Inspections include a limited use of CCTV inspection where different small portions of the underground network are viewed annually, and periodic visual observations by staff for open conveyance systems. Inspections also occur in response to complaints. Where possible, existing sewers are rehabilitated using trenchless technologies, which extend their lives at a fraction of the cost of replacement.

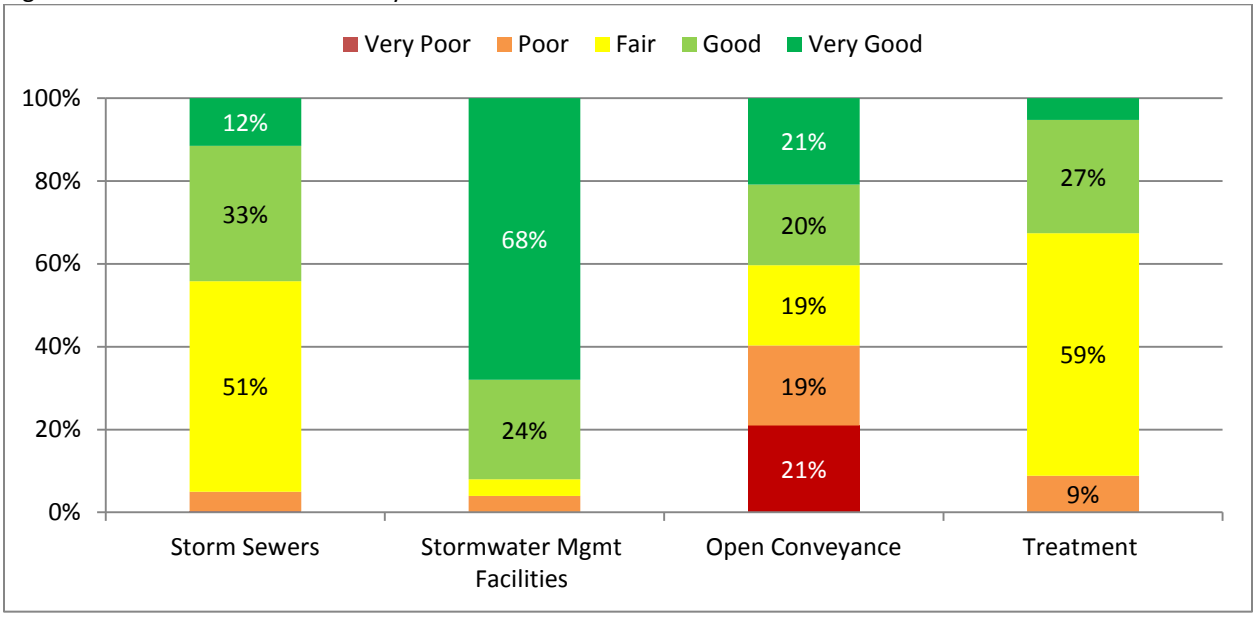
Stormwater Management assets include Storm Water Management Facilities (the ponds, dykes and dam), and their related equipment. The ponds provide water quantity, quality and erosion control for the majority of recently developed areas. The ponds are relatively new technology (first one built in 1981) and are expected to have long lives. Stormwater management assets also include some smaller treatment facilities such as separators, biofilters, etc., which are strategically placed where needed in the City. Storm Water Management assets undergo regular inspection to identify proactive and reactive investment requirements. One exception is Springbank dam, which is an asset owned by the City for recreational purpose rather than stormwater management. Therefore it is not included in this stormwater inventory section. The dam is currently off line and will need to be addressed in future reports.



Picture 32 Summerside Stormwater Pond

Asset Condition – Stormwater

Figure 18 - Asset Condition Summary – Stormwater



Storm Sewer assets are the highest value stormwater asset type and are shown to be in **Fair** to **Good** condition based on information collected from the City's limited sewer inspection program. Sewers are inspected on a rotating basis and evaluated using a standardized rating system to evaluate the risk of failure and anticipated investment needs. The fraction of total storm sewers inspected annually is small which weakens the overall integrity of the condition data for this inventory class.

Detailed condition data is unavailable for **Open Conveyance** assets. Condition presented is based on age and estimated useful life information. Failures (blockage) could result in flooding requiring immediate response. Proactive remediation is undertaken based on routine staff observations and annual planned programs. To date, this strategy has been generally adequate to protect against flooding. For the purpose of this assessment, in the absence of data, assets have been distributed based on age recorded in the TCA data noting that age is not a good methodology to gauge condition of open conveyance systems. However it is the best available method. Storm channel maintenance occurs as part of the annual planned program and work rotates through the assets depending on

Picture 33 Broken and Removed Stormwater Grates

available time and resource. Investments requirements are determined based on staff observations and public inquiries and complaints.

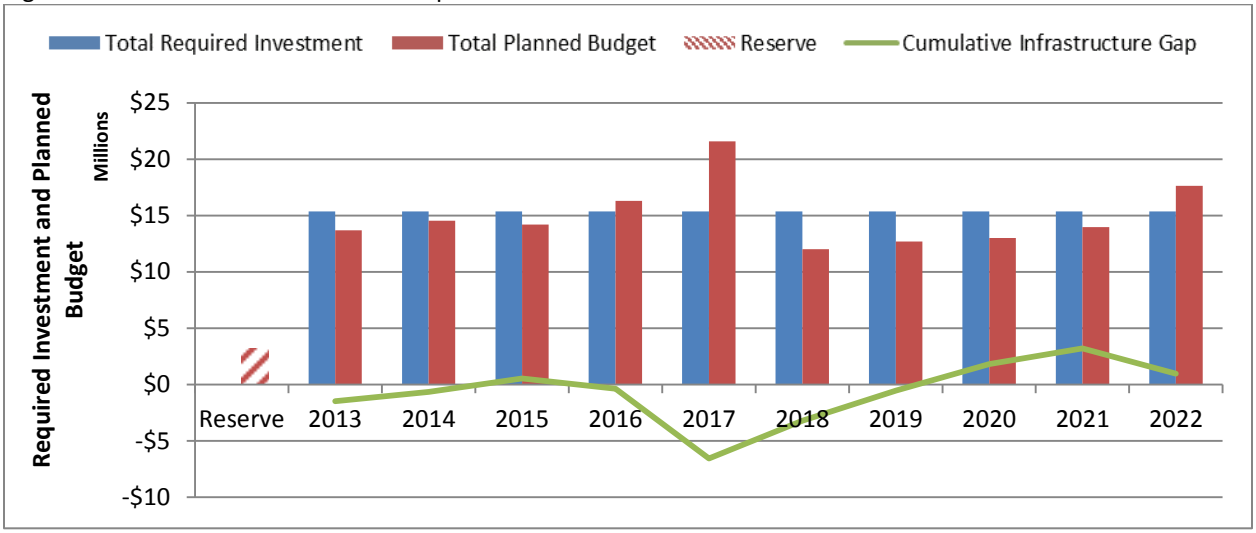
Formal condition data has been collected through a recent study (2012) by AECOM for **Stormwater Management Facility** assets in London reflecting the condition of the ponds generally as **Good** to **Very Good**. There are some major maintenance needs identified over the next twenty years. Recently the City has taken over construction of the ponds and adopted a stringent monitoring program. Due to the static nature of ponds, they are expected to last indefinitely provided they receive proper cleaning and maintenance. The ponds do need to be cleaned more frequently when heavy construction is undertaken within the drainage area feeding a pond. Ponds are managed on a proactive basis, with work performed recorded and analyzed for each location. Unplanned work is also undertaken based on staff observations of issues and public inquiries and complaints.

Stormwater Treatment assets (oil/grit separators and biofilters) are a minor part of the asset base and are considered in **Fair** to **Good** condition, based on age and expected useful life. These assets are maintained regularly, but capital renewal is performed reactively based on staff observations and public inquiries and complaints.

Picture 34 Heard Drain in Fox Hollow

Forecasted Infrastructure Gap – Stormwater

Figure 19 - Forecasted Infrastructure Gap – Stormwater



Evaluating planned budget vs. required investments shows that the Stormwater infrastructure gap is minor, growing to an estimated $1 Million over the next decade. Total required investment represents the costs to renew and maintain the existing assets so services can continue to be delivered. The infrastructure gap trend is primarily driven by renewal requirements for stormwater pipe. The Stormwater service area shares the same 20 Year Sewer System Plan as the Wastewater – Sanitary service area. The 2013 budget rate adjustments are intended to enable the entire wastewater system to reach financial and rate stability by 2018. With these changes the Stormwater service area intends to meet stormwater infrastructure renewal needs over the long term; including the infrastructure gap.

This estimate of the infrastructure gap does not account for any costs to improve service (e.g. new treatment technology), accommodate growth or expand service to new areas or customers. Required investment values presented are based on estimates of age and expected useful life noting that inventory and condition information in the Stormwater service area is limited. Furthermore, Stormwater is an evolving service where major process changes are possible. While still in its early stages, the use of low-impact-design philosophies and technology is growing within the stormwater management field. Costs associated with implementing innovative stormwater management practices must be considered in addition to those needed to maintain base infrastructure.

The expanding role of regulation in stormwater management may also play a role in the City's long-term investment requirements. While still in its infancy, many US jurisdictions are implementing stringent requirements governing the discharge of stormwater into natural waterways. Further study is needed to identify and evaluate the impacts associated with potential legislation on the City's needs.

There is some impetus to develop more privately owned and operated systems rather than be dependent on municipal infrastructure. To date this is a minor element in the London landscape.

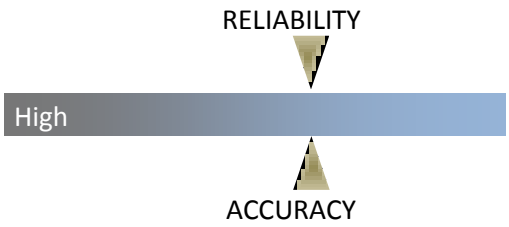
The other looming influence on stormwater infrastructure is the impact of climate change. Some London information has been advanced through studies by the University of Western Ontario. However the full impacts of this topic have not been determined for the City of London asset inventory as yet.

This State of Infrastructure Report assumes the wastewater reserve fund that is currently used for life cycle renewal projects is dedicated in its entirety to mitigate the infrastructure gap for both Stormwater and Sanitary. In reality, this reserve fund is also used to smooth fluctuations resulting from actual revenues/expenditures, fund growth and service improvement projects, as well as protect against emergencies and other unplanned events.

Conclusion – Stormwater

Valued at roughly $2 Billion, the City's Stormwater assets are overall in **Fair** to **Good** condition, indicating that they are meeting the City's immediate needs. However detailed condition data is generally limited for Stormwater services. Although the projected infrastructure gap is small, loss of Stormwater services can result in localized and/or global reductions to service. These may include significant impacts such as surface flooding, erosion, blockages, storm sewer backups, poor quality effluent, damage to the natural environment, etc. Further investment and planning will also be needed to accommodate advances in new technology and climate change. The 20 Year Sewer System Plan demonstrates an existing commitment to continue renewing infrastructure as it approaches the end of its useful life.

City of London Stormwater Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$ 1,993,151,000		**No Gap**	**$ 973,373**



Section 2: Transportation Services

Picture 35 Wellington Street Extending into Downtown

Section 2: Transportation Services

Roads & Structures

Transportation infrastructure is such a crucial part of our lives that we often take it for granted. If you leave your home, you use the transportation service. Good roads and structures promote business, create employment, provide social opportunities, create markets, and save lives. When the transportation infrastructure is deficient, business suffers, accident frequency increases, wear and tear on vehicles increases, emergency response deteriorates, the environment is negatively impacted, congestion increases and opportunities are lost.

London owns enough roads to reach from London to Las Vegas and enough sidewalks to walk from London to Myrtle Beach...

The importance of efficient transportation is essential to building a strong economy and improving the quality of life for our citizens. The City contributes to the local economy and quality of life by supporting the safe and efficient movement of people and goods using transportation infrastructure while managing the growing cost of transportation. The City of London operates and maintains roadway, bridge and sidewalk infrastructure thus enabling safe and effective travel.

Asset Inventory and Valuation – Roads and Structures

The value of the City's extensive road network is slightly less than $2 Billion. The Roads & Structures section includes assets ranging from roads, sidewalks and other City assets on right-of-way lands, to vehicular and pedestrian bridges. Assets associated with Lighting and Parking are addressed separately in this report. Two provincial freeways, the 401 and 402 pass through London but fall under the ownership and control of the Province. Similarly, rail and air transportation modes are not owned or managed by London.

Picture 36 Dufferin Avenue

Assets falling under the Roads category include Local streets, Primary and Secondary Collectors, Arterials, and City owned Expressways and Freeways. These assets include road base, asphalt, curb and gutter, islands, street furniture, etc. Manholes belong to their respective utilities. Street trees belong to Forestry.

Assets falling under the Structures category are broken out based on purpose. Bridges and Major Culverts are vehicle crossing structures; Footbridges are major pedestrian crossings at highways or waterways; Pedestrian Tunnels are underground structures that support pedestrian movement between buildings or under roadways; Noise Walls are vertical structures used to attenuate traffic noise from major routes;

and Major Retaining Walls are engineered structures used to stabilize embankments. Bridges and Major Culverts are inspected and maintained to Provincial Bridge Standards. The remaining structures are assessed and renewed on a planned basis according to the findings of Engineering Studies.

Table 16 – Asset Inventory & Valuation – Roads & Structures [7]

Asset Type	Asset		Inventory	Unit	Replacement Value ($000's)
ROADWAYS	Roads	Local	1,750	Lane.km	$630,255
		Secondary Collector	507	Lane.km	$206,672
		Primary Collector	135	Lane.km	$56,166
		Arterial	1,264	Lane.km	$455,004
		Freeway	22	Lane.km	$8,360
		Expressway	39	Lane.km	$13,503
	Sidewalks		1,471	km	$78,309
STRUCTURES	Bridges		101	Ea.	$271,507
	Major Culverts (> 3m in diameter)		94	Ea.	$56,393
	Footbridge		4	Ea.	$10,448
	Pedestrian Tunnel		7	Ea.	$7,149
	Noise Wall		44	Ea.	$29,289
	Major Retaining Walls		13	Ea.	$9,061
TOTAL					**$1,832,115**

Asset Condition – Roads and Structures

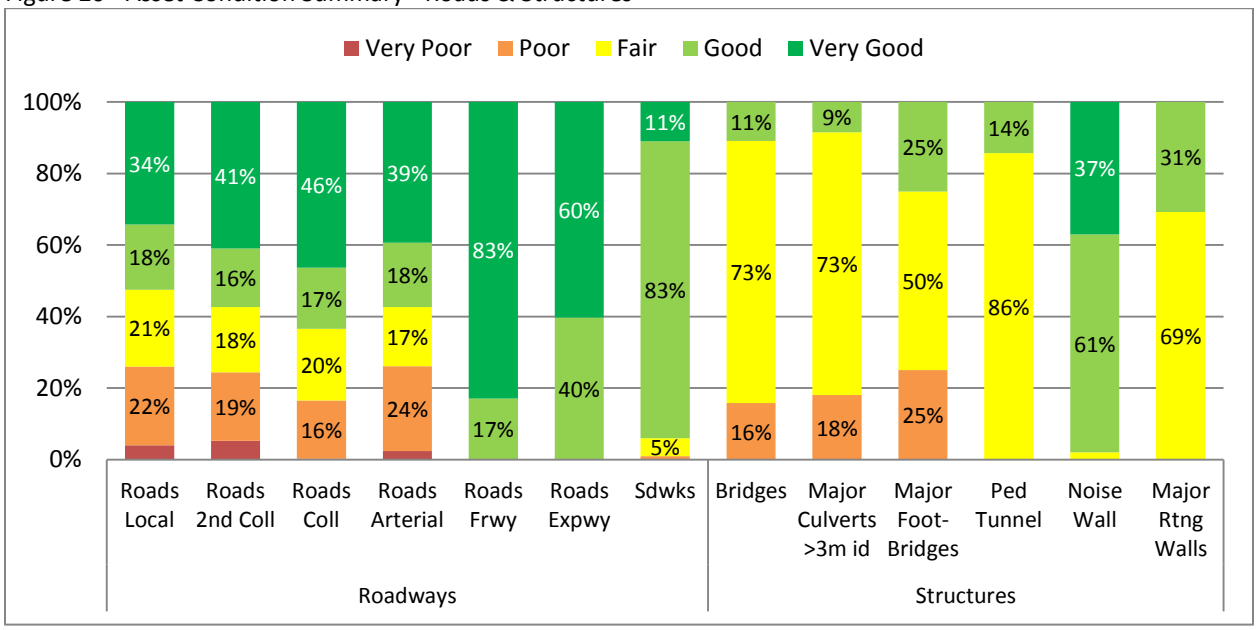
The condition of our Roads and Sidewalks are evaluated on a regular basis using varying condition assessment techniques. Paved Roads are assessed on a 4 year cycle based on testing the outer lane of the width using a combination of visual rating with surface distress and longitudinal profile (wheel path roughness) data collection. Visual Rating is used for curb type and condition. Results are analyzed and used to establish the pavement quality for each road segment in the City measured against road criteria known as the Pavement Quality Index (PQI). Road sections that are at an optimal time for specific rehabilitation treatments are placed on a list for rehabilitation. The highest priority roads are rehabilitated dependent on budget availability. The roads that are not repaired join the list for future budgets. Staff and public observations also result in spot repairs as needed, i.e. potholes.

Picture 37 Fanshawe Park Rd. Sidewalk and Bike Path

[7] Note that administrative, maintenance and storage buildings are maintained by the City's Facilities group. Fleet and associated equipment is provided and serviced by Fleet and are dealt with in the Fleet section. Land is also excluded from this asset pool and dealt with in the Land section.

In London, gravel roads generally represent a small rural portion of the London road network and are visually inspected and repaired reactively. Sidewalks are annually walked and rated visually to identify trip hazards and major deficiencies. Sidewalk repairs are made based on the assessment results or feedback from the public and staff. Temporary sidewalk repairs are made quickly until full repairs can be made. The sidewalk maintenance program is losing ground against budget cutbacks. Visual observations and public feedback are the primary triggers for repair for any remaining roads assets such as furniture.

Figure 20 - Asset Condition Summary - Roads & Structures [8]



The City Roads network is broken into six categories based on traffic loading and characteristics. Local roads are managed to a network average PQI target of 50, while secondary collectors are managed to a PQI target of 55; which correspond to fair condition and allows for some localized pavement distress. Primary Collectors and Arterials, are managed to a network average PQI target of 60, while City owned Expressways and Freeways are managed to a PQI target of 65; which correspond to good condition and only allows for minor deficiencies. Generally speaking road assets are maintained on a lifecycle basis through the selection of the optimal treatment based on their current condition and projected deterioration. Treatments range from patching and sealing, to resurfacing, to total reconstruction, and are selected to minimize the lifecycle cost of operating each asset within its target state. The majority of the network, **Local Roads**, **Primary and Secondary Collectors** and **Arterial Roads** are rated in **Fair** condition with approximately 20% of each road class being poor to very poor and requiring near-term rehabilitation. **Expressways** and **Freeways** are generally rated in **Very Good** condition.

City **Sidewalks** are managed proactively so as to address trip hazards and safety concerns. Sidewalks are walked annually, and those having major issues scheduled for immediate repair. Sidewalks are also

[8] This analysis is done for roads on a Kilometer basis and for structures on a unit basis.

evaluated and renewed as part of neighbourhood renewal and redevelopment activities, where replacement of assets is coordinated with other construction works. Sidewalks are primarily in **Good** condition indicating that they are free of trip hazards and major damage. This rating is expected to drop as the repair backlog increases.

City owned **Bridges** and **Major Culverts** are managed to Provincial Bridge Standards. Assets are inspected using the Provincial Bridge Rating System on a rotating basis to identify structural issues and concerns. Deficiencies are noted and combined with other service requirements in planning corrective action. Three quarters of City bridges are in **Fair** condition, indicating that most current structures are operational and free of urgent deficiency and requiring rehabilitation in the medium term. Assets in Poor condition are in need of some type of attention over the short to mid-term.

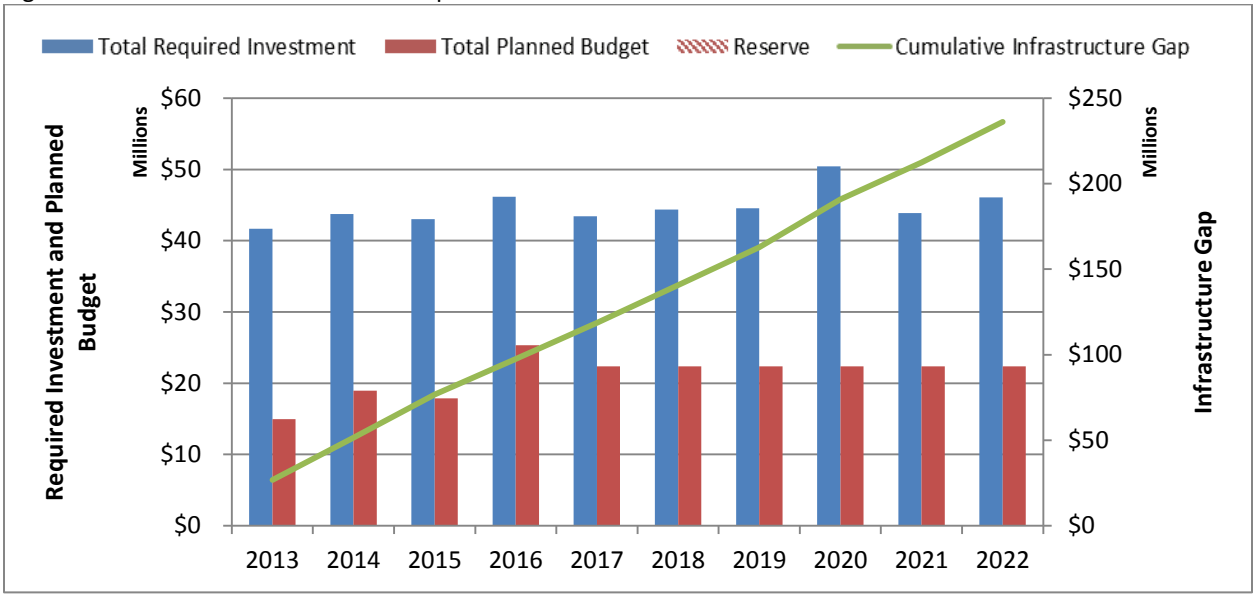
Footbridges and **Pedestrian Tunnels** are managed for safety to Provincial Bridge Standards and City aesthetic standards. Assets are monitored by City crews and evaluated regularly using engineering studies. Needs are prioritized based on urgency and addressed as needed through capital renewal. Overall the City's major Footbridge and Pedestrian Tunnel assets are in **Fair** condition indicating that most are operational and free of urgent deficiency. One footbridge is currently undergoing reconstruction.

Picture 38 Springbank Pedestrian Bridge

Noise Walls and **Major Retaining Walls** are managed to meet safety and City aesthetic standards. Assets are monitored by City crews and evaluated regularly using engineering studies. Needs are prioritized based on urgency and addressed as needed through capital renewal. Noise Walls are currently in **Good** to **Very Good** condition, indicating that they are free of significant defects. Major Retaining Walls are in **Fair** condition indicating that that they are operational and free of urgent deficiencies.

Forecasted Infrastructure Gap – Roads & Structures

Figure 21 - Forecasted Infrastructure Gap – Roads & Structures



Total required investment represents the costs to renew and maintain the existing assets so services can continue to be delivered. The forecast does not account for any costs to improve service, accommodate growth or expand service to new areas or customers.

Evaluating the required investment forecast for **Roads** and **Sidewalks** shows that, at current funding levels, the infrastructure gap would grow to approximately $200 Million over the next decade. Trends presented are primarily driven by the Main Roads renewal, which accounts for roughly 70% of this deficit. Local roads, while still under funded make up approximately 25% of the projected gap, however this may decrease as performance targets are lower for these routes. Sidewalks make up only 5% of the projected funding gap noting that sidewalk investment is not generally broken out within the City's capital budget. Overall the gap continues to increase projecting a general decline in the condition of roads in the City of London. This infrastructure gap will become visible to Londoners through rough roads, potholes, increased vehicle damage claims, reduced road safety, poor pedestrian facilities and increased operating costs.

Evaluating the required investment forecast for **Bridges** and **Structures** shows that, at current funding levels, the infrastructure gap would grow to over $30 Million over the next decade. Trends presented

are primarily driven by the approval of the requested budget. This infrastructure gap will manifest itself with bridge load restrictions, potential closures and reduced safety.

Also excluded from the forecast are costs associated with addressing the number of Major Roads over traffic capacity. A new road expansion plan was produced with the SmartMoves Transportation Master Plan, which was completed in 2013. It is expected that the new Master Plan will be integrated into the budget forecast in 2015. Without an expanded growth program, congestion is expected to increase.

The funding of transportation infrastructure from a lifecycle perspective has varied over the last decade with increases to the base transportation funding primarily provided through external government grants and stimulus programs. It is noteworthy that the capital budget approval was less than requested by $3.6 Million which effectively increases the gap over the total presented by the 2012 perspective. In October 2013, Council directed Administration to develop a long term Financial Implementation Strategy to address the Transportation Infrastructure Gap.

Conclusion – Roads & Structures

Valued at nearly $2 Billion, the City's Roads and Bridges infrastructure assets are currently in overall **Fair** physical condition provided congestion is not considered. Funding shortfalls in all asset groups will result in a degradation of Roads and Structures over the next decade, particularly for the City's Arterial Roads. The infrastructure gap will become visible to Londoners through rough roads, potholes, increased vehicle damage claims, reduced road safety, poor pedestrian facilities and increased operating costs, bridge load restrictions, potential closures and reduced safety. Civic Administration intends to deal with the infrastructure gap through long term strategic planning and continued efforts to lobby senior levels of government for infrastructure funding.

City of London Roads & Structures Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$ 1,832,115,000		**$ 26,705,000**	**$ 236,165,000**

Picture 39 Wellington Street Bridge - SoHo

Picture 40 Pedestrian Tunnel at South London Community Centre

Section 2: Transportation Services

Traffic

Traffic assets are used to support reliable, efficient and safe transportation through pedestrian/vehicular traffic control, appropriate lighting, signage and pavement markings. The City's Roadway Lighting and Traffic Control group is responsible for planning and operating this critical infrastructure.

We could make a million cups of coffee using the energy burned in our street lights every year…

Asset Inventory & Valuation – Traffic

To meet transportation needs, the City owns and operates an extensive inventory of static, electrical and electronic infrastructure valued at over $200 Million. Assets range from street lighting units, to vehicular and pedestrian signals, to regulatory and informative signage, and road line markings.

Table 17 – Asset Inventory & Valuation –Traffic [9]

Asset	Inventory	Unit	Replacement Value ($000's)
Lighting	33,444	Units	$120,000
Signals	388	Locations	$93,200
Signage	8,687	Units	$1,737
TOTAL			**$214,937**

Traffic infrastructure is broken into three categories: Lighting, Signals, and Signage. Maintenance and upkeep of Lighting and Signals assets are contracted out to a third party. However design and operating activities are undertaken by City staff. The contracts and Provincial standards govern asset performance and the timing of work. The City also maintains road signage and line markings. Major and minor regulatory signage is governed by the Highway Traffic Act, and local bylaws, respectively. Guide or Information signs are posted according to City policy and as defined in the Ontario Traffic Manual.

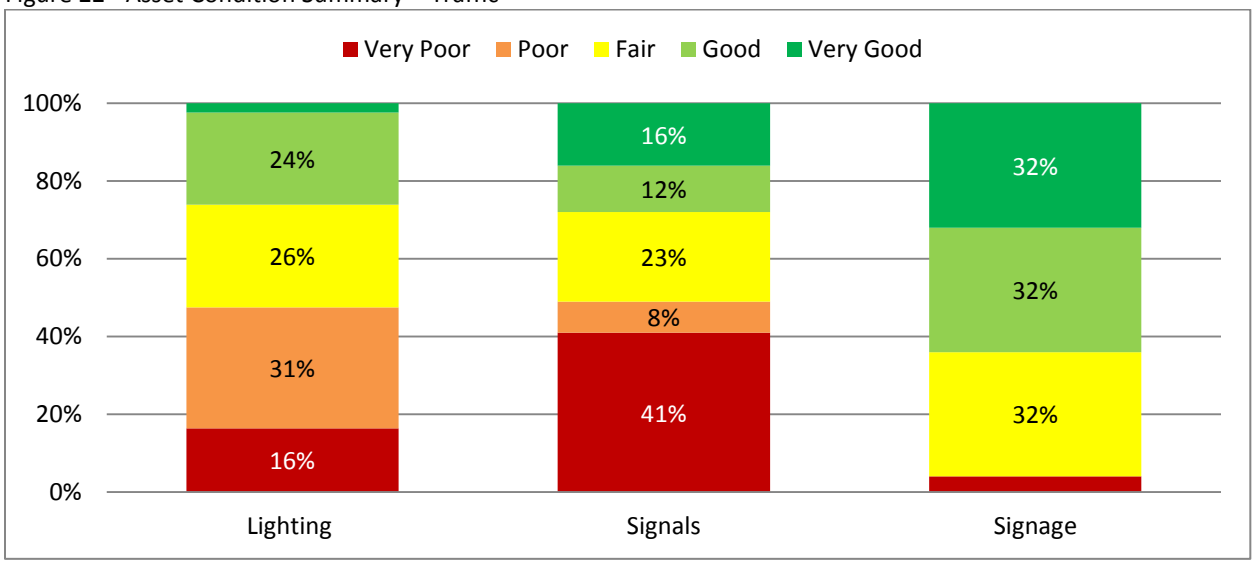
Picture 41 Dufferin Ave & Wellington St Intersection

[9] Data limitations prevent the inclusion of line markings in the inventory or condition ratings presented in this report.

Lighting is a significant consumer of energy. Future trends in the asset base are likely to be technological advancements like conversion to LED sources. The City is also likely to pursue traffic efficiencies through new and smarter technology.

Asset Condition – Traffic

Figure 22 - Asset Condition Summary – Traffic



Maintenance of **Lighting and Signals** infrastructure is contracted out. The nature and frequency of re-lamping and pole maintenance are based on best practices and requirements in the contracts. The City is directly responsible for signal timing and operation. Overall lighting infrastructure is in **Poor** to **Fair** condition, based on age and expected useful life. Electrical equipment tends to have a shorter useful life than other types of City infrastructure.

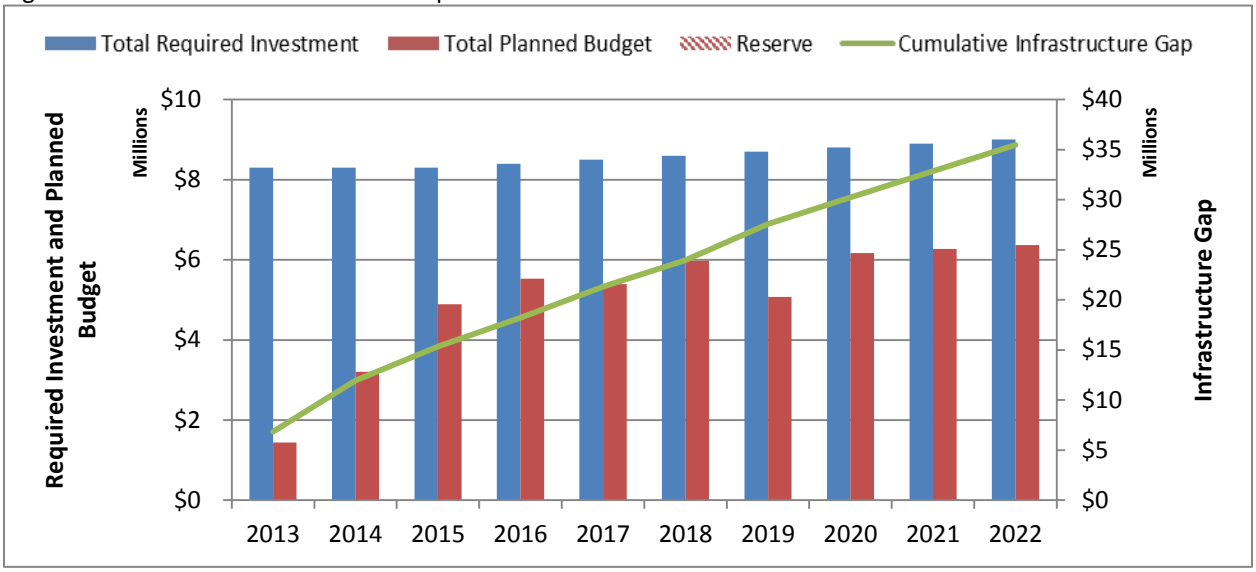
Picture 42 Downtown Decorative Street Light

Signage and line marking are maintained by City crews. Major regulatory signs (e.g. Stop Signs) are tested for reflectivity on a rotating basis and maintained based on the evaluation results. Minor regulatory (e.g. No Parking) and Guide/Information signs are managed reactively based on citizen inquiries and staff observations. Major regulatory signage is largely in **Good** to **Very Good** condition, with few variances from reflectivity and condition standards. The condition of Minor Regulatory and Guide / Information signs is not currently tracked.

Line markings on major routes are reapplied semi-annually. The condition of the line markings vary throughout the year based on traffic, type of marking and time since reapplication. There are 1271 km of line markings not including intersections.

Forecasted Infrastructure Gap – Traffic

Figure 23 - Forecasted Infrastructure Gap – Traffic



Evaluating the required investment forecast for Lighting and Signals shows that given current investment, the infrastructure gap will grow to approximately $35 Million over the next decade. Total required investment represents the costs to renew and maintain the existing assets so services can continue to be delivered. The forecast does not account for any costs to improve service, accommodate growth or expand service to new areas or customers. The Traffic infrastructure gap is driven primarily by the continued use of infrastructure that has surpassed the end of its estimated useful life; 47% of Lighting and 49% of Signals were rated to be in Poor or Very Poor condition. Better condition information on Lighting and Signals assets would improve the accuracy of this finding. Age may not be the best indicator for condition of the asset. Streetlight outages, electrical failures, increased liability, reduced network signal coordination and reduced safety will be some of the outcomes of this growing infrastructure gap.

Picture 43 Pedestrian Signal

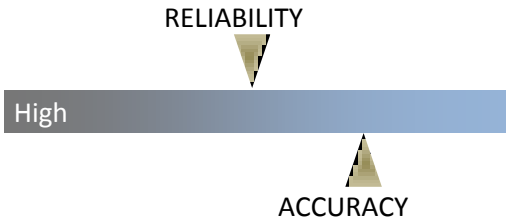
There is no infrastructure gap for line markings as they are completely renewed twice per year. Signage and line markings are not significant contributors to the Traffic infrastructure gap.

The historical underfunding of transportation infrastructure has led to an overall decline of infrastructure and an accumulation of a backlog of required works.

Conclusion – Traffic

Valued at approximately $200 Million, the City's Traffic infrastructure assets are overall in **Fair** condition. However this service area continues to be underfunded against the projected need. Without further investment, this will result in a degradation of service over the next decade. Streetlight outages, electrical failures, increased liability, reduced network signal coordination and reduced safety will be some of the outcomes of this gap. Without additional capital funds to re-build infrastructure, the maintenance costs will increase. Civic Administration intends to deal with the infrastructure gap through long term strategic planning in conjunction with roads and structures.

City of London Traffic Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap in 10 Years
$ 214,937,000		**$ 6,856,000**	**$ 35,474,000**



Section 2: Transportation Services

Parking

Parking in the City of London is a complex business not unlike most other municipalities. The City owns both parking lots and on-street parking stalls; some of which are user pay and some of which are free for public use. There is significant competition in the downtown where private user pay parking facilities outnumber municipal lots and garages significantly. The City of London, as a non-profit corporation, provides controlled rate parking to citizens and visitors through convenient short-term on-street parking and long-term off-street parking. This supply supports businesses, commercial and institutional facilities and entertainment venues. This involves balancing the general need to provide access to convenient parking, while ensuring traffic flows, emergency vehicles access and accessibility parking is available for permitted users. A significant task for the City is ensuring compliance with Parking rules that exist to protect the public interest.

IN 2012 LONDON ISSUED 1,211 TICKETS TO PEOPLE WHO ABUSED WHEEL CHAIR PARKING.

Picture 44 Horton at Ridout Parking Lot

Asset Inventory & Valuation – Parking

To meet London's parking needs, the City maintains an inventory of 1,570 on-street and 1,430 off-street parking stalls, along with other supporting infrastructure including enforcement assets. Valued at over $5 Million, the parking asset base is made up of a mixture of infrastructure (pavement, curbs, etc.[10]), land, and equipment (meters and pay stations).

Table 18 – Asset Inventory & Valuation – Parking [11]

Asset	Inventory	Unit	Replacement Value ($000's)
Pay Stations	65	Ea.	$715
Parking Meters[12]	1,483	Ea.	$1,631
Surface Lots[13]	11	No. of Lots	$3,348
	1,116	No. of Stalls	
TOTAL			**$5,694**

City crews operate and maintain meters and pay stations. Basic inspections are performed daily in conjunction with the collection of payments. Issues are flagged and combined with call-centre inquiries into a reactive work list. Lots are maintained through contracts with external providers for routine maintenance like snow, litter and minor repairs.

Picture 45 Dundas Street Pay Station


Picture 46 On-street Parking Meter

[10] On-street infrastructure replacement value captured in Roads Section.

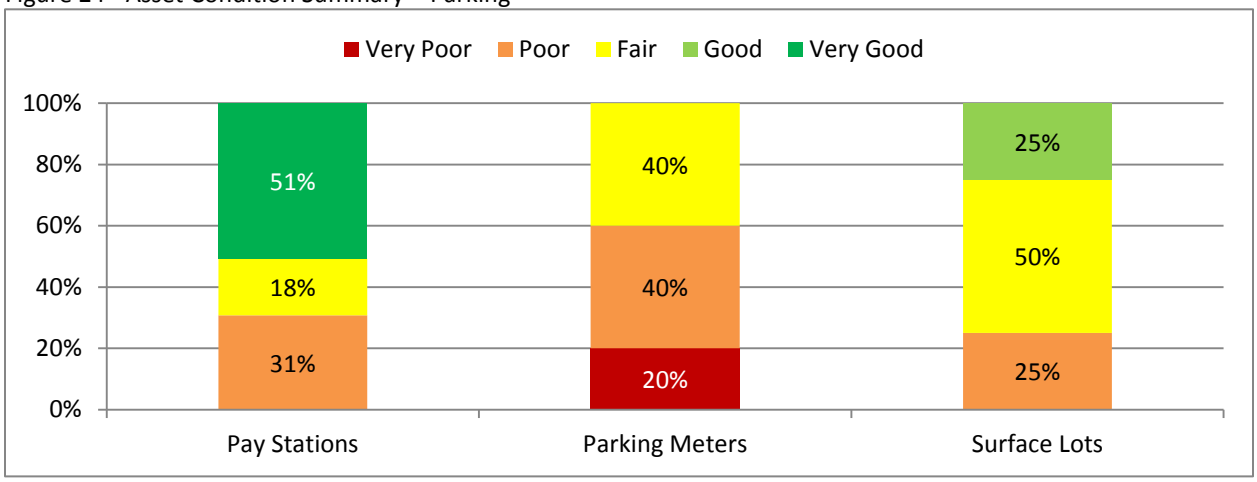
[11] Note that the City Hall parking garage, parking administrative, maintenance and storage buildings are maintained by the City's Facilities group and reported in the Facilities section. Fleet and associated equipment is provided and serviced by Fleet Management Services and are dealt with in the Fleet section. Land is also excluded from this asset pool and dealt with in the Land section.

[12] Value based on current City of London program to replace, on average, 10 old individual meters with 1 new pay-and-display station.

[13] The lots include one lot owned by both the PUC and the City at Ridout and Horton.

Asset Condition – Parking

Figure 24 - Asset Condition Summary – Parking [14]



The **Pay Stations** asset group is or will soon be in **Very Good** condition. A parking program is currently underway in the City to transition from antiquated mechanical single/double meters to solar powered digital pay stations that cover an average of 10 on-street parking stalls as well as entire/partial parking lots. The new equipment increases the efficiency and effectiveness of managing municipal parking. All scheduled replacements of coin operated meters are expected to be completed within the next five years.

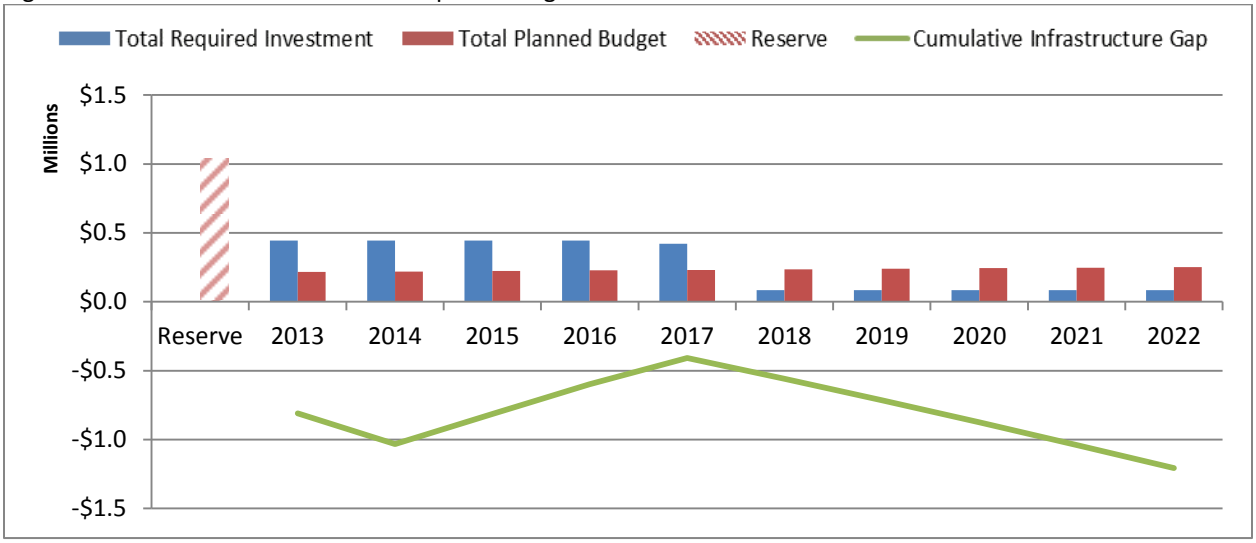
The **Parking Meter** asset group will be virtually eliminated by the change to pay stations. Individual meters will only be used in isolated circumstances where only a few parking spots are available that do not warrant the investment to install a full pay station. During the course of the changeover operating meters will be kept functional with spare meters/parts from the inventory of decommissioned meters kept by the Parking service. Current Parking meters are generally in **Poor** condition.

Surface lots are generally in **Fair** condition with three lots in **Poor** condition. They require further study to detail their condition. The Parking service area has plans underway to complete a condition study for surface lots and address any concerns that are raised. Meanwhile, maintenance is reactive responding to observations by staff and feedback from the public.

[14] Condition of pay stations and parking meters is on a per unit basis. Condition of surface lots is provided on a per lot basis.

Forecasted Infrastructure Gap – Parking

Figure 25 - Forecasted Infrastructure Gap – Parking



Total required investment represents the costs to renew and maintain the existing assets so services can continue to be delivered. The forecast does not account for any costs to improve service, accommodate growth or expand service to new areas or customers.

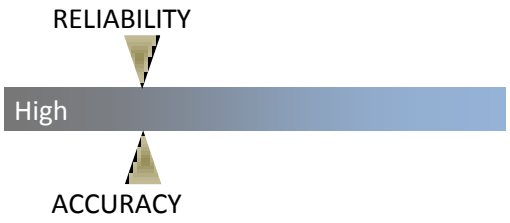
Provided the required investment and planned budget remain unchanged, the Parking infrastructure will remain stable over the next decade. Proactive financial planning and the use of reserve funding strategies, as well as the revenue received from Parking operations, has resulted in no current or projected infrastructure gap in the Parking service area. The City will need to plan for the replacement of the entire pay station inventory which will reach the end of their useful lives at roughly the same time requiring adequate reserve funds be in place.

It should be noted that the City of London has undertaken parking studies that show the City offers less municipal parking than peer municipalities. Parking assets may need to increase or change. Changes in technology can have a significant impact on the Parking service. Several visions exist as to the direction of vehicular travel such as electrical charging needs and greater reliance on public transit. The City is well placed to address these parking challenges.

Conclusion – Parking

Valued at nearly $5.7 Million, the City's Parking infrastructure assets are overall in **Fair** condition. However current investment plans indicate the service is sustainable over the next decade. The Parking service area has adequate funding to address their immediate needs including upgrading the current meter inventory to pay stations. If this circumstance were to change, lack of parking lot and meter maintenance would result in reduced revenue and increased service complaints. Loss of use of Parking would negatively impact businesses and residents. It is important that the funding plans for Parking continue in order to preserve its sustainable status. Parking is well situated to address future infrastructure requirements.

City of London Parking Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$ 5,694,000		**No Gap**	**No Gap**



Picture 47 City Hall Parking Entrance

Section 3: Environmental Services

Picture 48 W12A Leachate Tower

Section 3: Environmental Services

Solid Waste

The City contributes to the health of the environment and its citizens through appropriate collection and management of garbage, recyclables, yard materials, household special waste, and other designated waste materials. This involves providing pick-up and drop-off services within the City of London, processing and creating products of value from compostable/ recyclable/reusable materials; and disposing of garbage in an environmentally responsible manner, including the ongoing monitoring and management of closed landfills and other sites producing methane.

IN 2012, 50% OF CURBSIDE RESIDENTIAL WASTE AND 20% OF MULTI-RESIDENTIAL (I.E., APARTMENTS) WAS DIVERTED (REDUCED, RECYCLED OR COMPOSTED) FROM DISPOSAL.

Asset Inventory & Valuation – Solid Waste

Table 19 - Asset Inventory & Valuation – Solid Waste

Asset Type	Asset	Inventory	Unit	Replacement Value ($000's)
DIVERSION	Material Recovery Facility & Equipment	1	Facility	$22,373
	EnviroDepot	3	Ea.	$2,884
	Household Special Waste Depot	1	Ea.	$418
DISPOSAL	Collection Equipment - Containers	940	Ea.	$611
	W12A Buildings (Incl. Site Works & Equipment)	4	Ea.	$6,891
	W12A Leachate Collection System[15]	92	Ha	$14,101
	W12A Landfill Gas Collection System[16]	50	Ha	$2,867
	W12A SWM Ponds	4	Ea.	$1,561
	W12A Land and On-Site Buffer	142	Ha	$3,834
	W12A Off-Site Buffer Land	221	Ha	$5,967
	Closed Landfill Equipment[17]	29	Ea.	$2,730
TOTAL				$64,237

[15] The size of the Leachate Collection system reflects the area of capture common to this type of system.
[16] The size of the Gas Collection system reflects the area of capture common to this type of system.
[17] This represents the value of leachate and gas collection equipment at closed landfill sites. The value of land at these sites has been captured in the Land chapter of this report.

To support these services the City owns and operates an array of Solid Waste disposal and diversion assets valued at over $64 Million. These range from public waste and recycling bins, to drop off depots and one active (W12A) and many closed landfill sites. Note that the City of London's fleet of garbage trucks are not included in the Solid Waste inventory but rather are addressed under the Fleet section of this report. Fleet manages and maintains the trucks. Solid Waste operates the trucks.

Picture 49 Household Recycling Bins

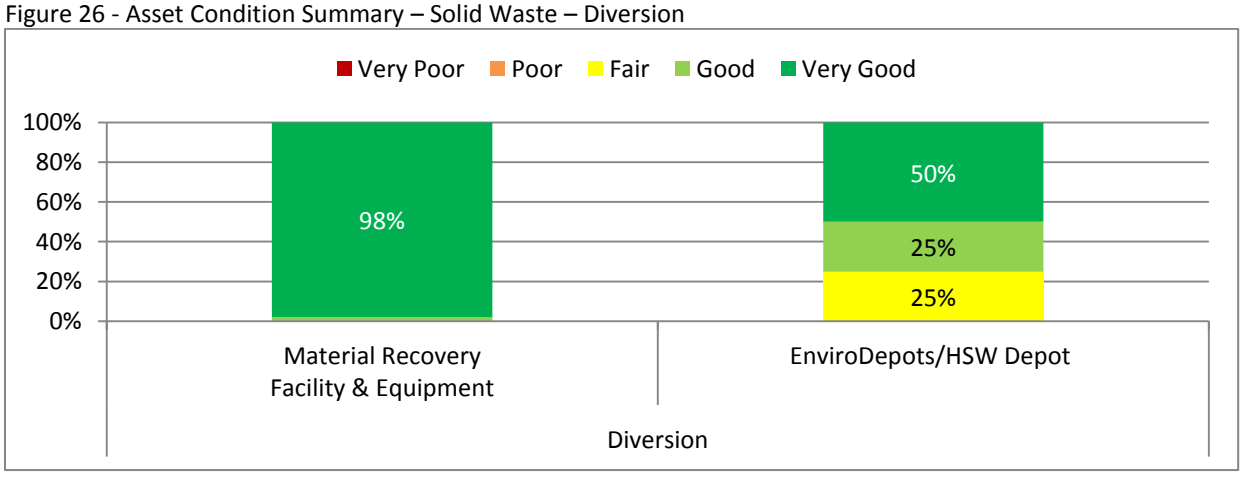
The City also owns a centralized Material Recovery Facility (MRF) which provides recycling services to London and several neighbouring communities.

General household waste is collected by the City while recycling pick-up and processing services are contracted out. Drop off locations are provided for special wastes including household special waste, yard materials, electronics, scrap metal, tires, roofing, etc.

The Solid Waste assets are broken into ten categories for which the condition was evaluated based on expert opinion from staff. Solid Waste is responsible for maintaining these assets in serviceable condition between replacement cycles, ensuring compliance with Provincial regulations and maintaining the continuity of solid waste services to the citizens of London and other customers.

Asset Condition – Solid Waste

Figure 26 - Asset Condition Summary – Solid Waste – Diversion



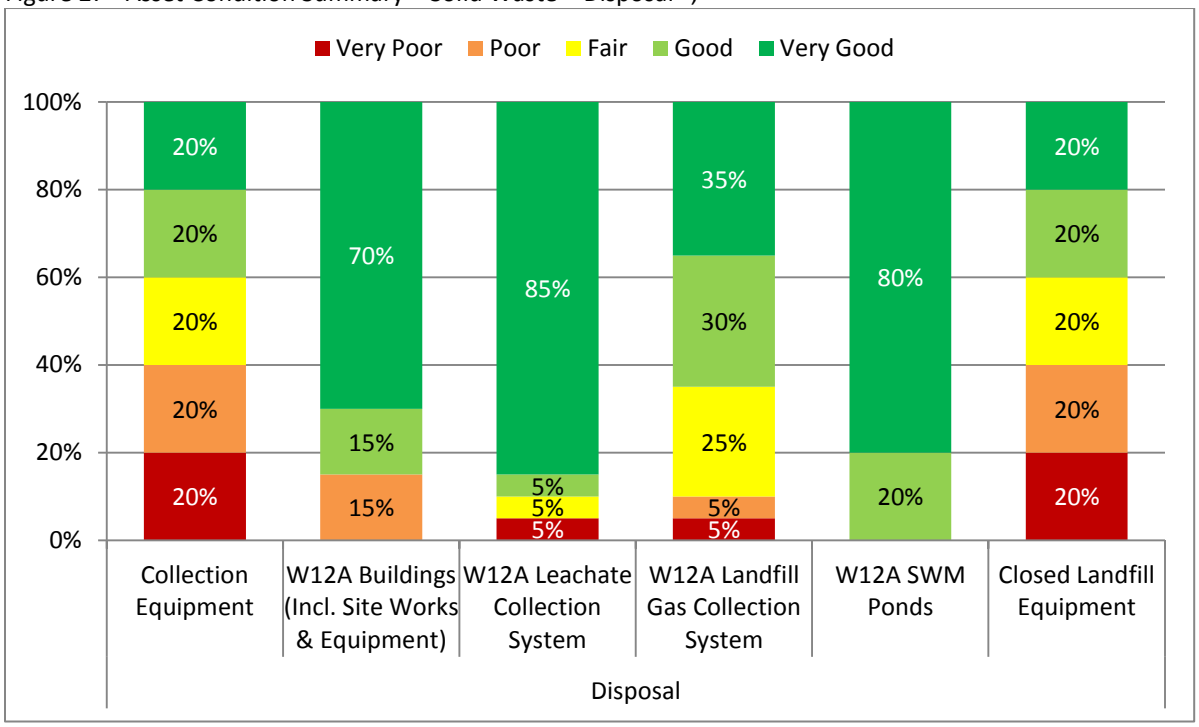
The **Materials Recovery Facility (MRF) and Equipment** shown in are in **Very Good** condition. This facility was newly constructed in 2011 and is operated and maintained by an outside contractor. Planned and reactive maintenance of the facility is the responsibility of the MRF operator by contract.

EnviroDepots and HSW Depot consist of depots where residents can drop off solid waste and/or recyclables. Facilities are currently serviceable but demand is increasing beyond the capabilities of the

existing facilities. The condition of the EnviroDepots and HSW Depot infrastructure is variable with 75% noted to be in **Good** to **Very Good** condition.

Solid Waste **Collection Equipment (Containers)** identified in consists mainly of disposal bins. The condition of the bins varies widely and is noted as being in **Fair** condition on average. The containers are maintained in serviceable condition, with replacement occurring on a planned basis as assets reach the end of their useful lives.

Figure 27 - Asset Condition Summary – Solid Waste – Disposal[18],[19]



The W12A Landfill consists of a number of assets including landfill cells, buildings, leachate and gas collection systems and stormwater maintenance ponds. This facility operates within its Operation Plan, with additional disposal cells being brought online to accommodate waste in accordance with its Environmental Compliance Approval. Based on projected use, the current landfill will reach capacity in about 2023, at which point it will require an expansion (or other long term disposal solution) to provide the city with the space needed to meet its future needs. Any

Picture 50 Landfill Exhaust Fans

[18] City owned Fleet and associated equipment is provided and serviced by Fleet Management Services and are dealt with in the Fleet section.

[19] City owned Fleet and associated equipment is provided and serviced by Fleet Management Services and are dealt with in the Fleet section.

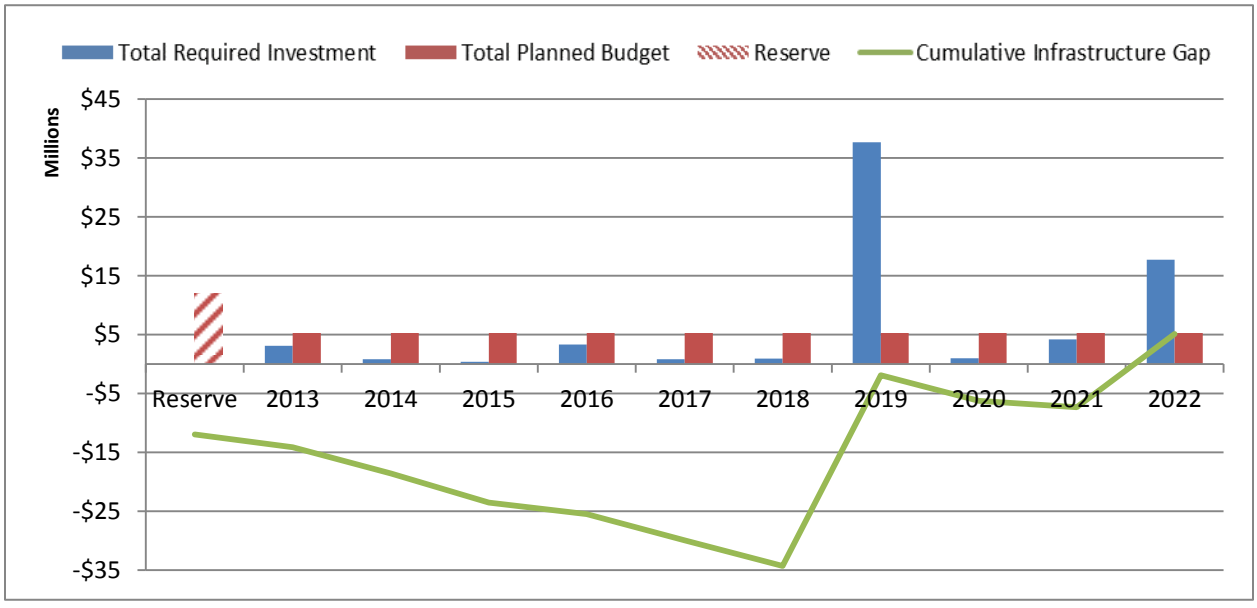
expansion or examination of alternatives will be undertaken as per the requirements of the Environmental Assessment Act. The **W12A Land and On-Site Buffer** and **W12A Off-Site Buffer** lands are not rated on a condition scale. Buffer land is comprised of City owned land adjacent or near the W12A Landfill that has been acquired to provide an appropriate buffer from existing operations and to provide buffering for possible future landfill expansion and resource recovery facilities. It is expected that additional land will be acquired for these purposes over the next several years.

The **W12A Buildings (Incl. Site Works & Equipment)** are generally in **Very Good** condition. This includes the roads, curbs and landscaping as well as the administration, maintenance and scale house buildings. The **W12A Leachate Collection System** collects and conveys leachate for treatment. This system is also generally in **Very Good** condition and capable of meeting the current City's needs and is expanded as new disposal cells are constructed. The **Landfill Gas Collection System** collects and conveys landfill gas to the on-site landfill gas flare for destruction. This system is in **Fair** to **Very Good** condition and capable of meeting current City's needs and is expanded as new disposal cells are constructed. On-site W12A **Stormwater Management Ponds** and site drainage infrastructure collect and treat surface runoff from snow and rain that impact the site. These assets are in **Good** to **Very Good** condition and capable of meeting current and future needs. Maintenance occurs on a planned basis, with investments identified through regular inspections.

Closed Landfills have generally been converted to parkland or other passive uses. Some sites have engineering controls (e.g. leachate collection systems, landfill gas collection systems and monitoring wells). The condition of the **Closed Landfill Equipment** on average is **Fair**. The equipment is maintained in serviceable condition, with replacement occurring on a planned basis as assets reach the end of their useful lives or as identified through regular inspections.

Forecasted Infrastructure Gap – Solid Waste

Figure 28 - Forecasted Infrastructure Gap – Solid Waste



Picture 51 W12A Landfill Entrance

Evaluating required investment versus planned budget shows that the Solid Waste infrastructure gap does not manifest until 2022. This trend is driven by Solid Waste's prudent strategy of saving in advance of forecasted capital expenditures (Sanitary Landfill Reserve Fund and Waste Diversion Reserve Fund). Total required investment represents the costs to renew and maintain the existing assets so services can continue to be delivered. The forecast does not account for any costs to improve service, accommodate growth or expand service to new areas or customers. Significant expenditures are forecasted in 2019 to address the need for increased diversion capacity and 2022 to expand the current landfill. Appropriate funding sources have also been identified over the next 10 years to ensure that the impact on taxpayers is minimized. Should the currently forecasted funding sources not be available, the infrastructure gap will rise significantly. Failure to adequately provide this service would result in risk to public health.

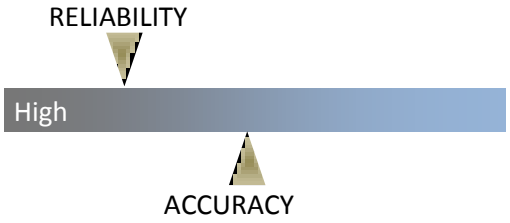
The expected life of a landfill cell is approximately two to three years. As these cells are filled, they are capped and new cells established to accommodate waste. While the current landfill footprint will remain constant for a number of years, the landfill will go through three cell replacement cycles over the next ten to eleven year period at which time the landfill is expected to be full and a new landfill or expansion of footprint will be required.

Over the past decade, the City has made significant efforts to reduce the amount of solid waste entering its landfill. While it has managed to divert 44% of waste produced, this is still short of the current Provincial target of 60%. Several options for further improvement are currently under consideration, including the expansion of existing programs, source separated organics ("Green Bin") service and other resource recovery options. The exact nature and timing of further action has yet to be determined, along with its impact on required spending. For budgeting purposes it has been assumed significant investment ($34.5 Million) in waste diversion will occur in 2019.

Conclusion – Solid Waste

Valued at approximately $64 Million, the City's Solid Waste diversion and disposal assets are overall in **Good** to **Very Good** condition. Investments in waste diversion and the construction of a new MRF have helped to extend the life of the current landfill to about 2023. Funding levels are sufficient to maintain current operations; however additional investment will be needed to meet the Province's long-term waste reduction targets and provide landfill service beyond 2023. Bearing in mind that expenditures for design, approval and construction will need to occur well in advance of 2023.

City of London Solid Waste Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$ 64,237,000		**No Gap**	**$ 5,142,000**



Section 4: Parks, Recreation & Neighbourhood Services

Picture 52 Labatt Park Scoreboard

Picture 53 Carling Heights Optimist Community Centre Skate Park

Section 4: Parks, Recreation & Neighbourhood Services

Recreation

Recreation assets help us 'make London one of the greatest places to live, work, play and visit'. The City aims to provide affordable, accessible recreation opportunities promoting a safe, healthy and fun life style. Recreation is the section of Parks, Recreation & Neighbourhood Services that primarily deals with indoor activities like the services offered in arenas and indoor pools, but also manages important outdoor facilities like outdoor pools, golf courses and Storybook Gardens.

IF EVERY CHILD IN LONDON BETWEEN THE AGE OF 10 AND 14 SWAM ONE LAP AT THE CANADA GAMES AQUATIC CENTRE, THEY WOULD HAVE SWAM ROUGHLY THE LENGTH OF THE ST. LAWRENCE RIVER...

Asset Inventory & Valuation – Recreation

The replacement value of the City of London's recreation facilities is nearly $247 Million. These facilities enable a wide range of recreational and competitive summer and winter activities including skating, hockey, swimming and diving, various community based clubs and events, CPGA sanctioned municipal golf courses and special attractions.

Table 20 – Asset Inventory & Valuation – Recreation [20]

Asset Type	Asset	Inventory	Unit	Replacement Value ($000's)
ARENA & EQUIP	Arena	11	Ea.	$103,820
	Outdoor Ice Pad	2	Ea.	
AQUATICS & EQUIP	Community Pool	15	Ea.	$50,526
	Wading Pool	13	Ea.	
	Spray Pad	12	Ea.	
COMMUNITY CENTRE & EQUIP	Community Centre	13	Ea.	$49,473
	Other	2	Ea.	
GOLF	Course (18 Holes)	4.5	Ea.	$15,605
	Clubhouse	3	Ea.	
ATTRACTION	Storybook Gardens[21]	1	Ea.	$16,444
SENIOR CENTRE & EQUIP	Senior Centre	2	Ea.	$10,964
TOTAL				$246,832

[20] Note that administrative, maintenance and storage buildings are maintained by the City's Facilities group. Fleet and associated equipment is provided and serviced by Fleet Management Services and are dealt with in the Fleet section. Land is also excluded from this asset pool and dealt with in the Land section.
[21] Includes site works and facilities

Nearly half of the value of Recreation can be attributed to **Arenas**, which include 11 arena facilities and 2 outdoor ice pads. Arenas serve organized sports leagues by providing opportunities to participate in ringette, hockey, figure skating, special events, ball hockey, inline hockey, shuffleboard, day camps and lacrosse. Arenas also serve participants in public recreational skating, pick up shinny hockey, senior's skates and tots skates.

Picture 54 Medway Arena - Summer

The City's 3 indoor and 37 outdoor **Aquatics Facilities** are used by thousands of Londoners from infants to seniors. Facilities support community based recreation and learn-to-swim programs, as well as training and competition both at the development level and national level.

Picture 55 Carling Heights Optimist Community Centre Indoor Pool

The City's 13 **Community Centers** and 2 **Seniors Centres** provide accessible, quality, welcoming spaces for community recreation programs, activities, rentals/events and neighbourhood gatherings in support of strong neighbourhoods.

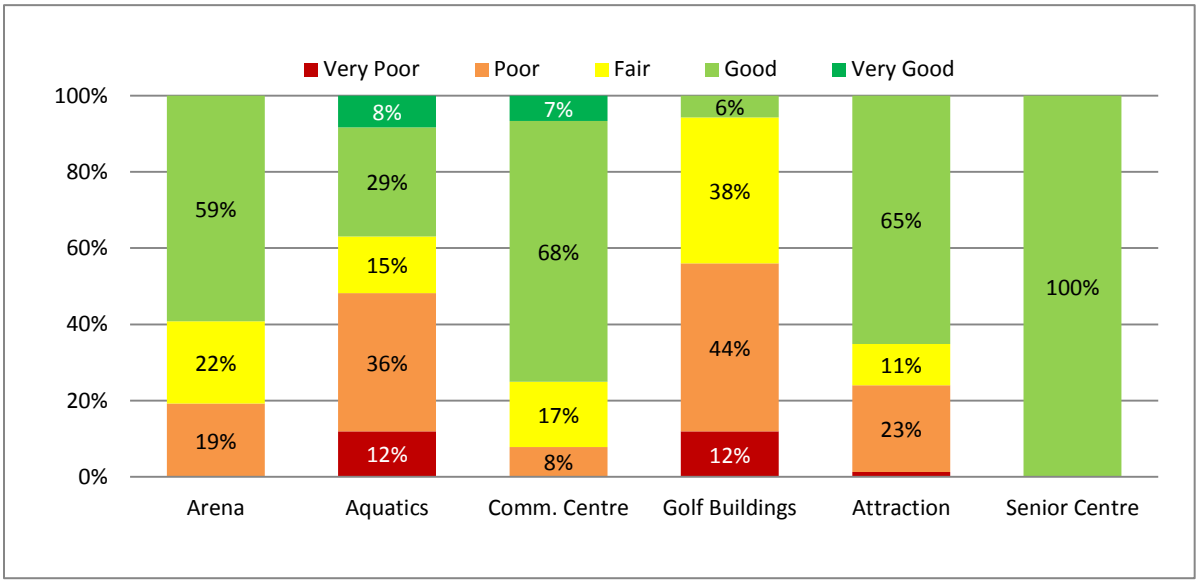
The City of London owns and operates the 9 hole Hickory Course located at Thames Valley Golf Course and four 18 hole **Golf Courses** (Thames Valley, Fanshawe Traditional, Fanshawe Quarry and River Road), which include three Clubhouses, and several maintenance buildings providing affordable golf opportunities to residents and visitors.

The Recreation area manages one of London's biggest children's attractions, the famous **Storybook Gardens**, a village of imagination offering year round activities for the children of London and visitors to our great City.

Asset Condition – Recreation

The condition of the structures used for Recreation activities is regularly evaluated through comprehensive condition assessments using an industry-standard Facility Condition Index (FCI) that accurately reflects the overall condition of the facilities (building envelope, mechanical and electrical systems, etc.). Similar programs do not exist for the recreational equipment inside the facilities. However the recreational equipment is a minor component of the total Recreation asset value albeit critical to the function of the service. Equipment is monitored and problems addressed when triggered by staff observations and public feedback. The Facility Condition Index is also not used for golf courses, just for the clubhouses and other buildings.

Figure 29 - Asset Condition Summary – Recreation



The **Recreation Facilities** are overall in **Fair** to **Good** condition, showing that the City has carefully maintained and upgraded its Recreation assets to accommodate the current needs of its Citizens. Generally speaking, this means that Recreation Facilities reflect only minor signs of wear and deterioration and operate reliably meeting current and short to mid-term needs.

Arenas fall in the **Fair** to **Good** condition category and represent the largest single portion of the total replacement value. The oldest operating arenas are Farquharson and Argyle both opening in 1954, the

majority of the remaining arenas were opened in the 1960's; most have received significant upgrades over the past decade.

A significant portion of **Aquatics** facilities fall within the **Very Poor** to **Fair** categories. This result is driven by the existence of a number of older Wading Pools in Poor condition and a select number of outdoor community pools in Poor to Fair condition. There is a general trend towards replacing wading pools with splash pads. Indoor Community Pools and Spray Pads are noted as generally being in Good to Very Good condition.

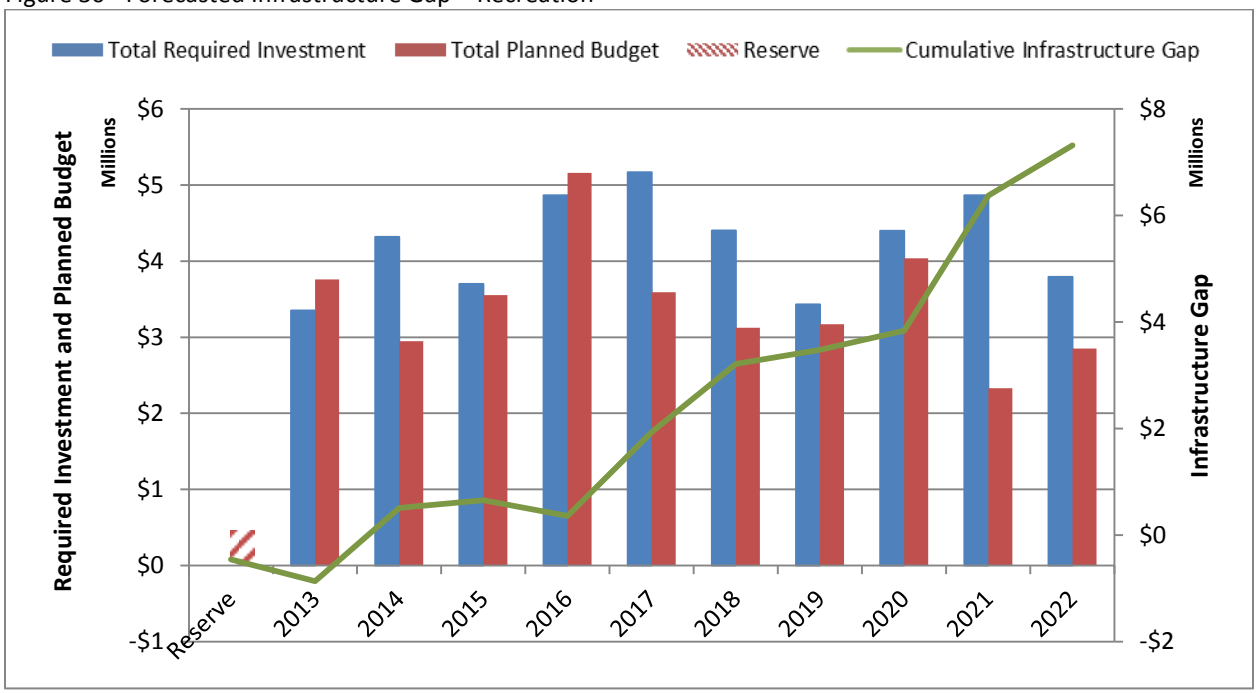
Picture 56 Fanshawe Municipal Golf Course

Community Centres fall in the **Good** condition category. The community centre are multi-purpose facilities providing rooms for rent for meetings, birthday parties, special events, tournaments, receptions and training events, bridal showers or seasonal parties. There are also gymnasiums for basketball, volleyball and a fitness centre with cardio and strength equipment. Some community centres have roller skating, indoor tennis courts and squash courts. Community centres are often associated with other recreation facilities such as arenas and aquatics.

Golf courses are generally maintained in **Good** to **Very Good** condition as required for playability. Golf buildings, including clubhouses and other on course facilities like washrooms, concessions and maintenance buildings, have less priority than the golf courses and are predominantly in **Fair** to **Very Poor** condition.

Forecasted Infrastructure Gap – Recreation

Figure 30 - Forecasted Infrastructure Gap – Recreation

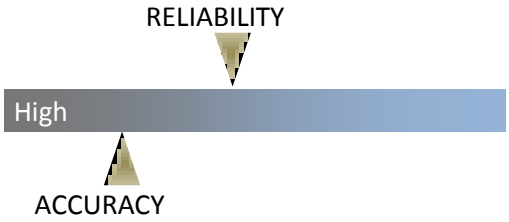


Projecting the condition of Recreation assets into the future, an analysis of the required investment vs. planned budget shows that the Recreation infrastructure gap will fluctuate around zero and grow to about $7.3 Million over the latter half of the next decade, driven mainly by the need to renew select Aquatics and major capital equipment. Total required investment represents the costs to renew and maintain the existing assets so services can continue to be delivered. The forecast does not account for any costs to improve service, accommodate growth or expand service to new areas or customers. While this provides a clear indicator that the gap is growing, further inventory and condition information regarding Recreation assets beyond the structures is needed to establish an accurate picture of the required investment.

Conclusion – Recreation

Valued at nearly $247 Million, the City's Recreation assets are overall in **Fair** to **Good** condition, indicating that sufficient investments have been made over the past decades to maintain these facilities. Maintaining current investment will result in a $7.3 Million infrastructure gap over the next decade. Continued growth of the recreation infrastructure gap will lead to reductions in the level of service likely through restricted hours of operation, reduced service offerings and/or closure of facilities. Ultimately this leads to reduced quality of life and less recreation opportunities for the public. Council adopted the 2009 Parks and Recreation Strategic Master Plan which identified a number of gaps in the level of service provided by Parks and Recreation and offered a plan to eliminate these gaps. Further investment is needed to implement the plan as well as address the future life cycle needs of the current Recreation infrastructure.

City of London Recreation Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$246,832,000		**No Gap**	**$ 7,314,000**



Section 4: Parks, Recreation & Neighbourhood Services

Parks

Parks assets help us 'make London one of the greatest places to live, work, play and visit'. In accordance with the Parks and Recreation Strategic Master Plan (November 2009), 'by investing in neighbourhoods, the City is able to help develop leaders, support families, and build community capacity. In this way, downstream costs and impacts (such as crime, reliance on the social safety net, and poverty) are deterred and positive outcomes (such as increased literacy rates, improved health and physical activity levels, and enhanced quality of life) are strengthened.' Parks is the section of Parks, Recreation & Neighbourhood Services that primarily deals with outdoors activities and natural areas.

THE CITY OF LONDON HAS 1 PLAY STRUCTURE PER 270 CHILDREN IN THE 5 TO 14 AGE GROUP.

Asset Inventory & Valuation – Parks

The City's Parks service area is responsible for operating and maintaining a network of parks, paths and facilities valued at nearly $141 Million not including land. Parks provide a range of amenities that include a large network of trails and pathways, gardens and natural areas, a variety of sports fields and playground equipment, and a variety of public facilities including 'arguably' the oldest baseball field in the world, entertainment venues, public concessions and washrooms. The true asset value of the natural areas and open space is difficult to assess. For the purpose of this report, the 'natural areas and open space' value is assumed to consist largely of land which is reported separately in the Land section and trees which are reported in the Forestry section.

Picture 58 Canada Games Aquatic Centre

Picture 57 Storybook Gardens Entrance

Table 21 - Asset Inventory & Valuation – Parks Linear Assets

Asset Type	Asset	Inventory	Unit	Replacement Value ($000's)
PARKS LINEAR ASSETS	Thames Valley Parkway	41	km	$22,644
	Multi-use Pathways	107	km	$37,450
	Park Road	1	km	$1,000
	Hiking Trail	58	km	$1,450

Table 22 – Asset Inventory & Valuation – Parks Amenity, Facility and Other Assets [22]

Asset Type	Asset	Inventory	Unit	Replacement Value ($000's)
PARKS AMENITY ASSETS	Play Structures	161	Ea.	$15,220
	Soccer Fields	103	Ea.	$10,558
	Baseball Diamonds	79	Ea.	$6,330
	Parks & Recreation Parking	6,138	Spaces	$5,161
	Tennis Courts	64	Ea.	$3,840
	Synthetic Turf Football Fields	2	Ea.	$3,000
	Skate Boarding Facility	12	Ea.	$2,325
	Basketball Courts	43	Ea.	$1,290
	Swing Sets	130	Ea.	$813
	Multi-use Pads	7	Ea.	$525
	Off-leash Dog Park	3	Ea.	$450
	Community Gardens	15	Ea.	$150
PARKS FACILITY ASSETS	Bandshells	3	Ea.	$2,807
	Building, Clubhouse	7	Ea.	$6,122
	Pavilions	2	Ea.	$1,150
	Shelters	3	Ea.	$200
	Stadium	1	Ea.	$ 3,691
	Washrooms	21	Ea.	$5,250
	Washrooms & Concessions	4	Ea.	$1,400
OTHER ASSETS[23]	Tangible Parks Assets	Not Specified - Mix		$8,533
TOTAL				$141,358

[22] Note that administrative, maintenance and storage buildings are maintained by the City's Facilities group. Fleet and associated equipment is provided and serviced by Fleet Management Services and are dealt with in the Fleet section. Land is also excluded from this asset pool and dealt with in the Land section.

[23] This is a calculated value that aligns the TCA financial value and the value of Parks assets. It is assumed to include all other Parks assets not separately identified above e.g. monuments, furniture, lighting, signage, general equipment, landscaping, etc.

Parks infrastructure is broken into four categories: Parks Linear Assets, Parks Amenity Assets, Park Facility Assets and Other Assets.

The City owns and maintains approximately 207 kilometres of **Parks Linear Assets**, consisting of multi-use pathways (including the Thames Valley Parkway), park roads, and hiking trails.

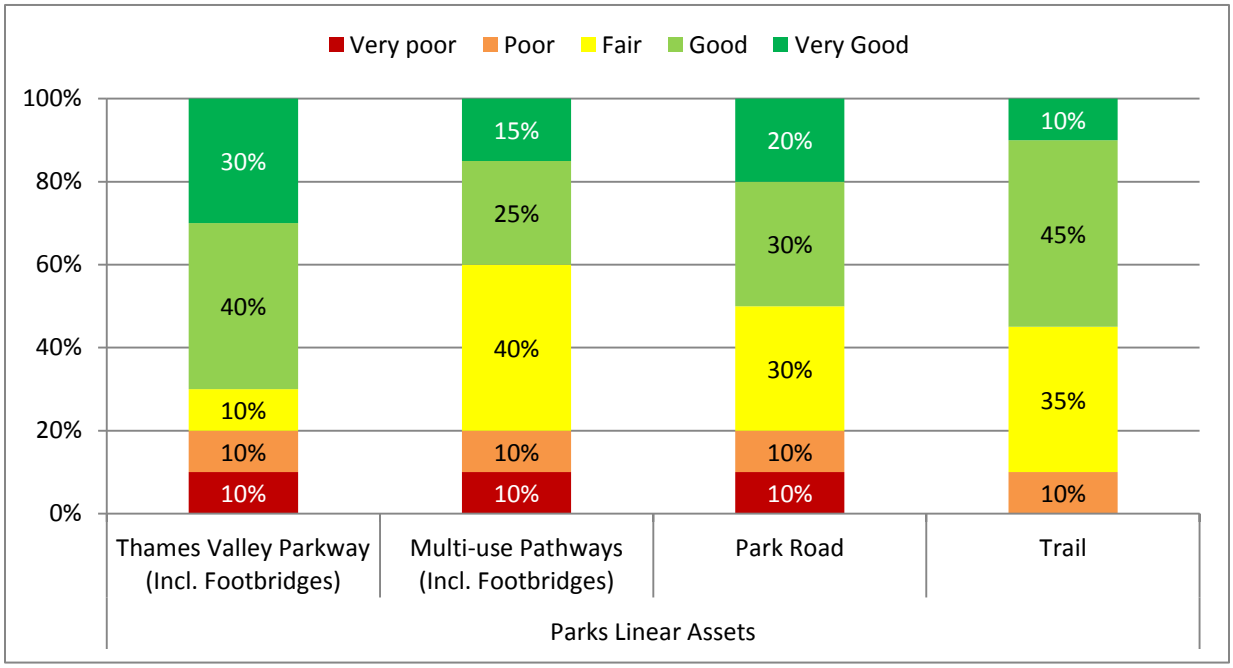
The **Parks Amenity Assets** are the highest value asset type in Parks; allowing the citizens of London to participate in and enjoy a wide range of sports and outdoor activities. These include a collection of over 600 sport fields and playgrounds such as football, basketball, baseball, soccer, skate boarding, tennis, children's playgrounds, manicured public gardens and off-leash dog parks. The City also owns and operates 41 **Park Facilities** (structures), including bandshells, clubhouses/buildings, a stadium, shelters, pavilions, washrooms and concessions. Many of the parks are equipped with miscellaneous accessory equipment such as benches, trash receptacles, lighting, water fountains, signage, monuments and decorative art. These are grouped under **Other Assets**.

Picture 59 Victoria Park Bandshell

Asset Condition – Parks

Parks does not currently have computerized asset management or maintenance management capability although work has been initiated to implement a computerized maintenance management system. Currently data on the condition of most of the assets is not formally collected and recorded. Regular visual safety inspections are conducted as part of maintenance and grounds keeping activities. All significant safety issues are addressed immediately. Maintenance issues, along with concerns identified by staff and the public are prioritized and addressed based on need. Parks facilities (structures) are formally assessed as part of the City's Facilities program, with issues resolved operationally or as part of capital improvements. Other assets are informally evaluated and needs addressed reactively.

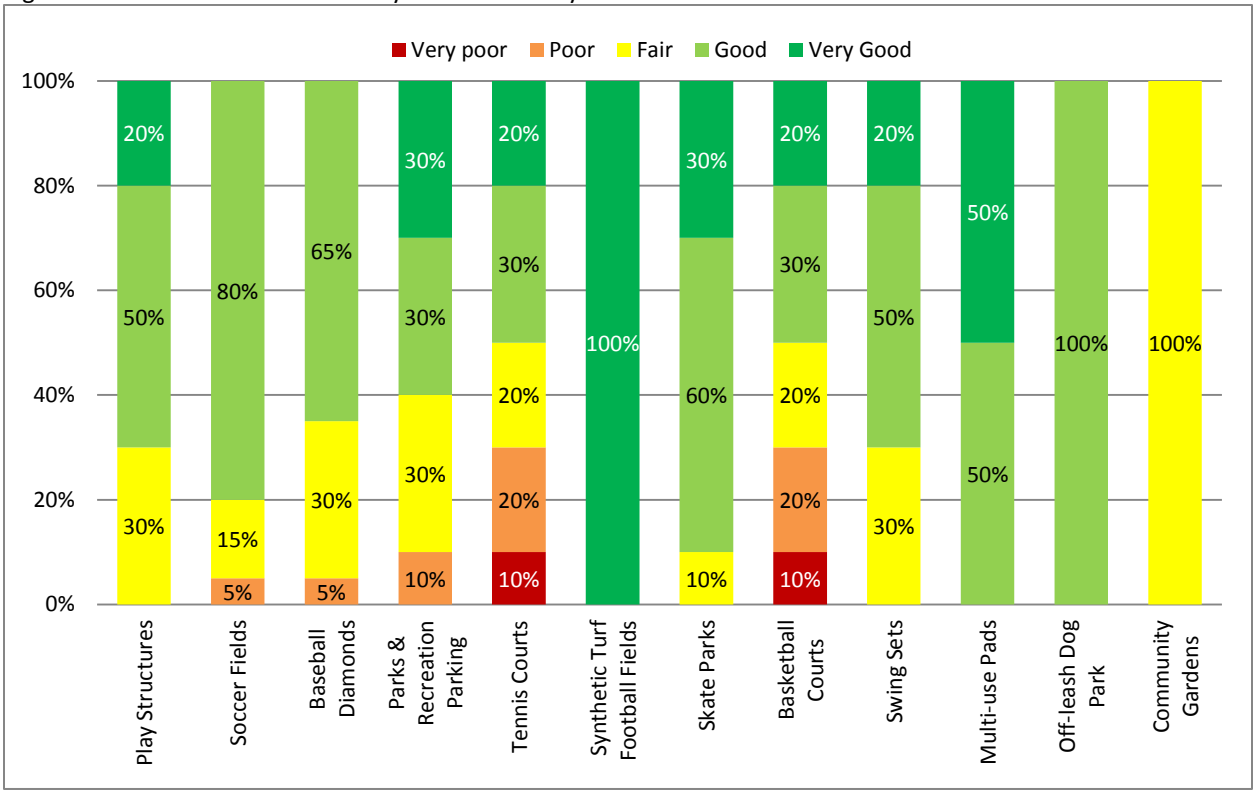
Figure 31 - Asset Condition Summary – Parks Linear Assets



Linear Assets including roadways, trails and multi-use pathways, are in **Fair** to **Good** condition, based on expert opinion from staff. Paved roads are evaluated as part of the City's pavement management program, with issues identified and prioritized for replacement under the Parks capital program. Trails and pathways, while not formally evaluated, are assessed for safety and trip hazards as part of normal maintenance activities indicating that surfaces are functional and show few signs of deterioration or reduced service. Known issues are prioritized and addressed reactively through operations or capital projects.

Picture 60 Multi-use Pathway in Greenway Park

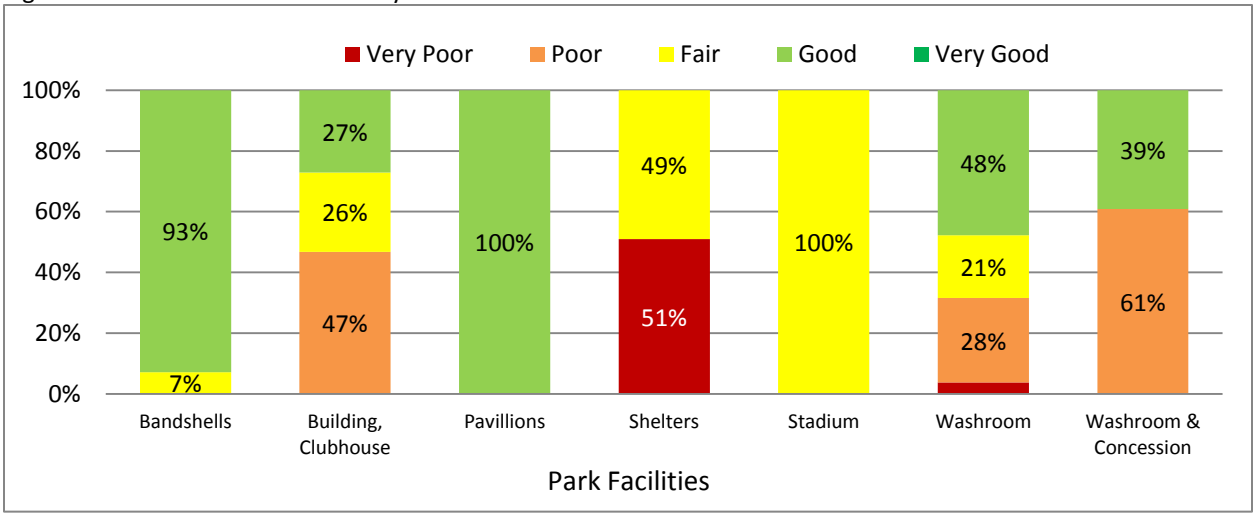
Figure 32 - Asset Condition Summary - Parks Amenity Assets



While **Activity Assets** do not undergo formal assessment, they are evaluated regularly for safety, with urgent issues flagged and targeted for resolution by operations staff. Over 80% of **Activity Assets** are felt to be in **Fair** or better condition, based on staff input, indicating that they are functional, but subject to superficial deterioration and intermittent closures for maintenance and repair. Parks would benefit greatly from a more formal condition assessment and monitoring system to help manage these key assets.

Picture 61 Trooper Mark Wilson Park Play Structure

Figure 33 - Asset Condition Summary – Park Facilities

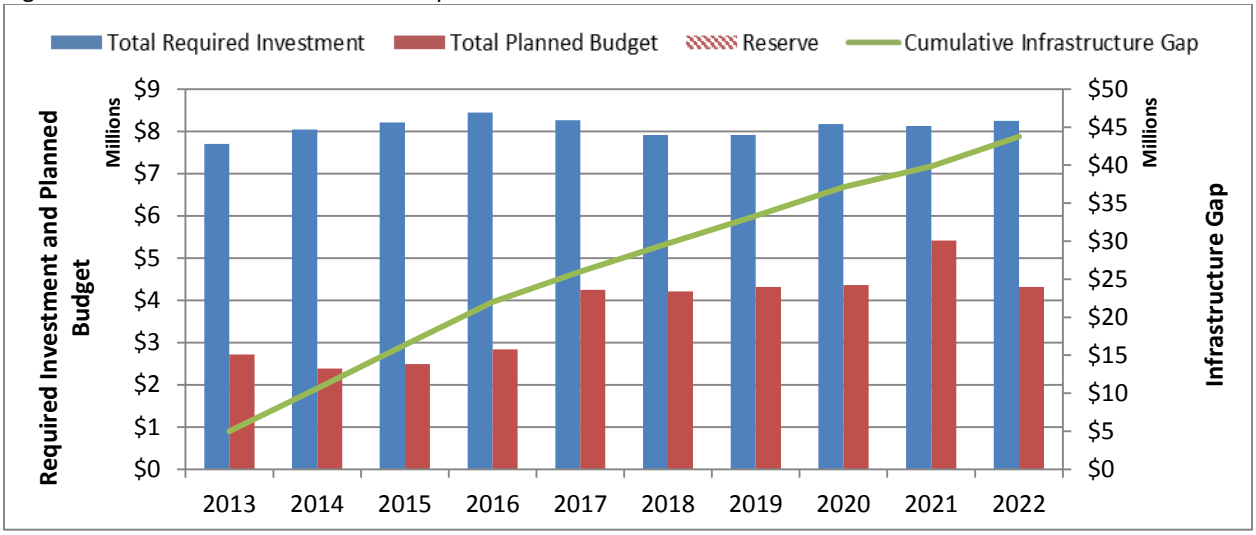


Park Facilities are evaluated through the City's facility assessment program. Bandstands, Pavilions and Washroom facilities are noted as being in **Fair** to **Good** Condition, indicating that they are functional and perform reliably based on current need.

Other Assets are noted as being in **Fair** to **Good** condition based on expert opinion, indicating that while they are largely functional, many show some signs of aging but are functional and adequately address current needs.

Forecasted Infrastructure Gap – Parks

Figure 34 - Forecasted Infrastructure Gap – Parks



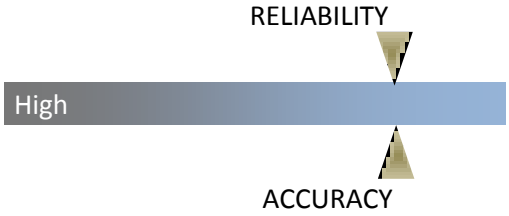
Parks has a $5 Million infrastructure gap growing significantly to $44 Million over the next decade largely driven by the needs of the Thames Valley Parkway, multi-use pathway systems and park amenities. There is a projected annual shortfall of $4 Million for capital maintenance and renewal of the Thames Valley Parkway, multi-use pathway system and park amenities based on estimated useful life.

Total required investment represents the costs to renew and maintain the existing assets so services can continue to be delivered. The forecast does not account for any costs to improve service, accommodate growth or expand service to new areas or customers. The estimates for the Parks infrastructure gap are based on anticipated useful lives and replacement values derived from expert opinion. Reliability and accuracy are rated as low. Expanded condition assessment would lead to better information for planning the renewal needs for parks and the pathways in particular. Historically Parks has relied on field observations as the trigger for work but is now in the process of developing computerized maintenance management and asset management processes which can be expected to provide more robust information regarding their infrastructure gap.

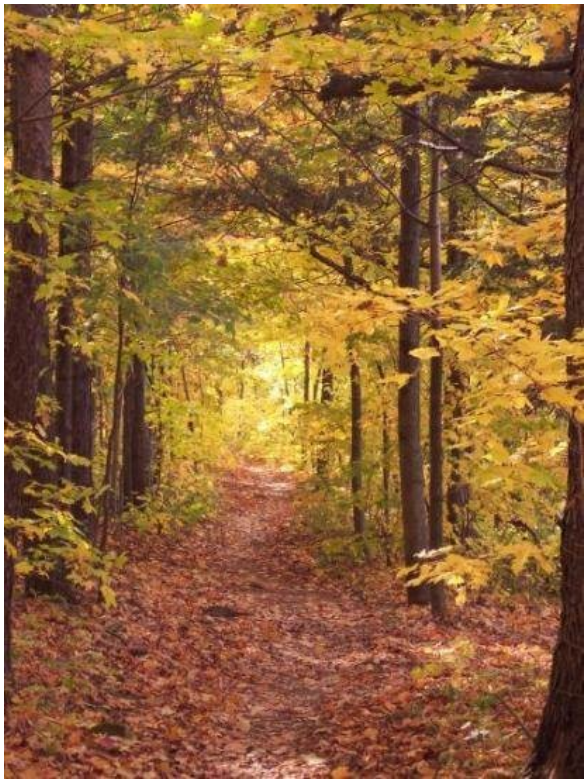
Conclusion – Parks

Valued at approximately $141 Million, the City's Parks assets are overall in **Fair** condition, indicating that assets are functional but showing signs of deterioration. Maintaining current investment will result in an infrastructure gap of approximately $44 Million over the next decade. Failure to address the infrastructure gap could result in localized reductions to service, such as visual signs of deterioration, potential closure of amenities, high maintenance costs or global service reductions such as fewer parks per capita, reductions to operating hours, etc. Additional effort in the evaluation of asset condition and long-term investment requirements is needed to verify these findings. Council adopted the 2009 Parks and Recreation Strategic Master Plan which identified a number of gaps in the level of service provided by Parks and Recreation. Further investment is needed to implement the plan as well as address the future life cycle needs of the current Parks infrastructure.

City of London Parks Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$ 141,358,000		**$ 4,990,000**	**$ 43,763,000**



Picture 62 Victoria Park Southeast Corner



Picture 63 Woodland

Section 4: Parks, Recreation and Neighbourhood Services

Urban Forestry

The City of London takes pride in being known as "The Forest City." Our urban forest is recognized both as an asset and a vital component of our green infrastructure, natural heritage system and our quality of life. Unlike our other assets, trees are living and increase in value with age for most of their life cycle. The condition of a tree relates primarily to its health unlike other assets which focus on age and 'wear and tear.' Our urban forest is at risk from insect, disease, weather damage and development pressures. In the past, there has been a reactive approach to managing these issues. The development of proactive and timely asset management practices is critical to sustain a healthy urban forest.

SOME CITIES IN CALIFORNIA MANDATE 50% CANOPY COVER ON PARKING LOTS TO REDUCE VEHICLE EMISSIONS AND EXTEND ASPHALT LIFE THROUGH REDUCED TEMPERATURE

Asset Inventory and Valuation – Urban Forestry

The current value of the urban forest owned by the City is approximately $513 Million. The inventory does not include privately owned trees. Management and operation of the City's urban forest is under the expert care and custody of the Urban Forestry section of the Planning Division with operational aspects of management shared with the Forestry Operations section of Environmental and Engineering Services.

The Forest inventory is divided into three types of trees; woodland or wooded parkland trees, manicured parkland trees and urban road allowance trees.

Table 23 - Asset Inventory & Valuation – Forestry

Asset	Inventory	Unit	Replacement Value ($000's)
Trees in woodlands or wooded portions of parks (700 hectares)	869,400	Ea.	$434,700
Urban trees within road allowance	121,600	Ea.	$60,800
Trees in manicured portions of parks (1,970 hectares)	35,623	Ea.	$17,800
TOTAL			**$513,300**

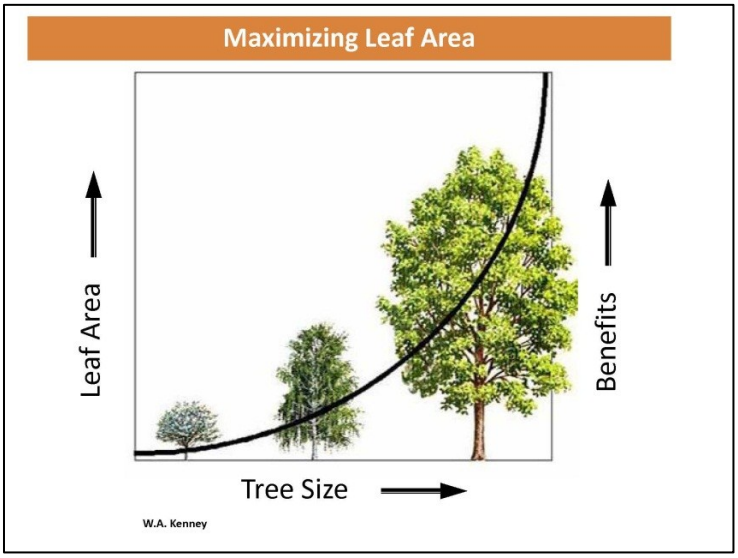
Trees in woodlands or wooded portions of parks are not counted individually but rather on an average number of 1,242 trees per hectare. This factor was adopted from a 2008 UFORE (**U**rban **For**est **E**ffects) analysis which studied total tree species across London whether private or public.

An initial inventory of urban road allowance trees as well as those found in portions of manicured parks was completed in 2002. Some effort has been made to update the early inventory with the updated data reflected in this report. Further work is needed to improve the integrity of this continually

changing inventory. Currently, reporting capability for various inventory attributes is limited. The current computer program to manage the tree inventory is in the process of being replaced and should be functional in the fall of 2014.

Replacement values for trees are treated differently than for typical City assets like pumps, simply because trees grow. The environmental and other benefits of trees increase exponentially with size, age and health. This relationship is shown in the diagram below modified from the UFORE analysis. A tree that is 50 centimetres in diameter provides more than twice as many environmental benefits (such as amount of pollution removed from the air, amount of oxygen released into the air, etc.) than a tree 25 centimetres in diameter. Since it is not feasible to replace a tree 100 centimetres in diameter with another tree 100 centimetres in diameter the City recommendation for the replacement of trees is to plant an equivalent diameter of trunk compared to the tree that had to be removed. When the recommendation is followed, the net impact is more trees planted than removed which with time could increase the inventory provided the City complies with the recommendation. Current practises do not replace all tree losses. An Urban Forest Strategy and implementation plan are being developed which will set tree cover canopy targets and which will govern the management of trees and wooded areas for the next 20 years

Figure 35 - Incremental Benefit of Mature Trees

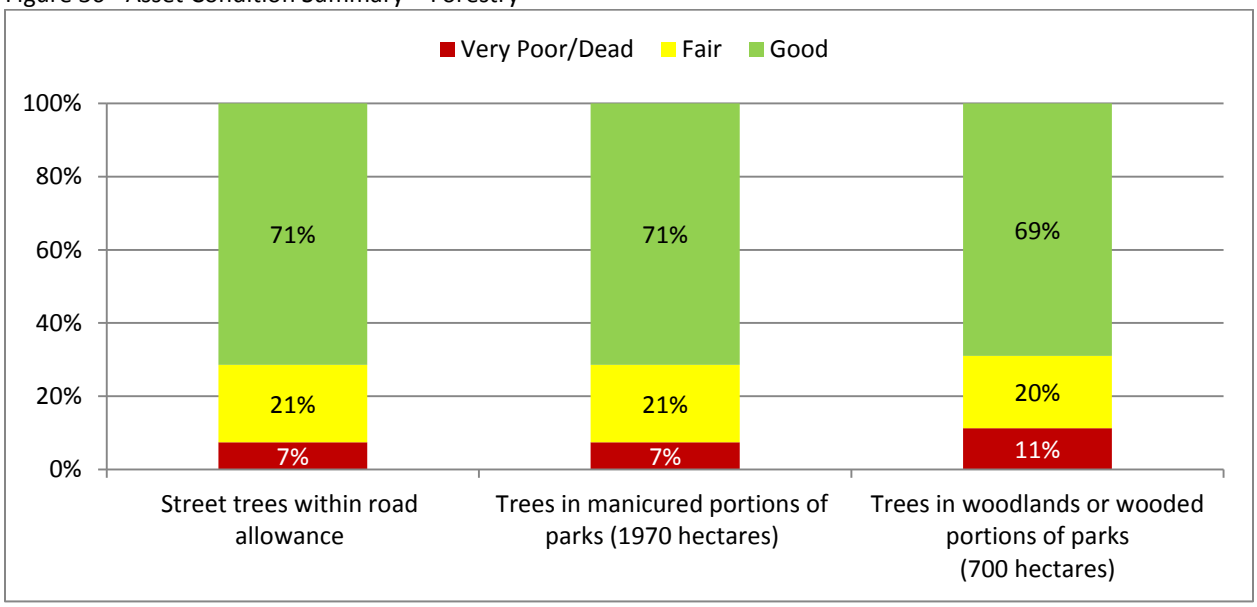


Asset Condition – Urban Forestry

The condition ratings for street and manicured portions of parks are derived from the 2002 tree inventory. The condition ratings for trees in woodlands and wooded portions of parks are derived from the 2008 UFORE analysis. In general the total number and condition of the trees is decreasing with respect to the older trees and some species such as ash which are being devastated by Emerald Ash Borer. Removal of larger trees from boulevards is often due to ongoing replacement of aging infrastructure, increased urban intensification and development pressure, poor historical maintenance practices and environmental factors such as storms and old age. Manicured park trees are often impacted by the level of use and management practices while woodland trees are impacted more by

environmental factors such as invasive species, disease and adjacent development. Ash species make up 10% of all the trees in London and often represent the most numerous trees in woodlands. The full impact of Emerald Ash Borer has yet to be realized and may significantly impact the condition assessment and gap identified in this report section.

Figure 36 - Asset Condition Summary – Forestry [24]



Trees that die or are removed in woodlands are often not replanted allowing invasive species such as buckthorn to take up the space. The current failure to replant will result in a future forest with less tree canopy cover due to fewer and smaller trees. The number of trees in boulevards and on private property is also being reduced as development occurs. New lots typically have smaller dimensions with little topsoil to replace the historical number of trees and ultimate size at maturity.

Trees often attain ages greater than 100 years (e.g. silver maples in Old North, or in woodlands) if they are the right tree for the right place, if their condition is monitored regularly, if they are maintained proactively and protected from development or other activities. Many can attain sizes greater than a metre in diameter and reach heights greater than 20 metres. Over the course of their lives

Picture 64 Uplands Street Tree

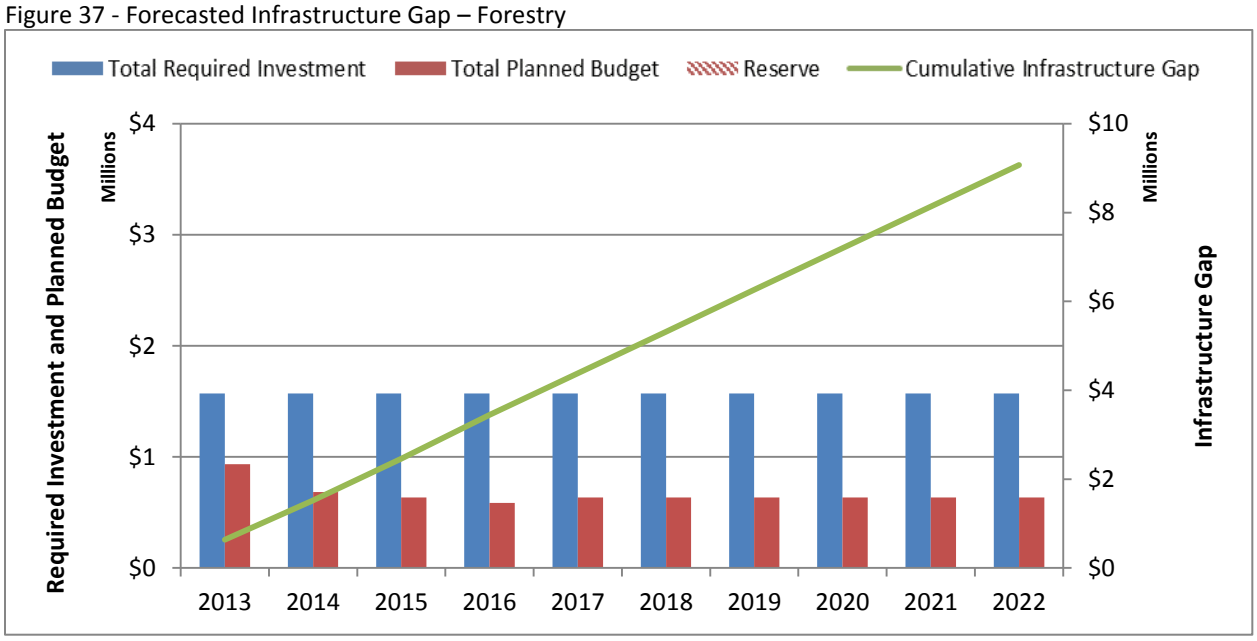
[24] Note that the asset condition in woodlands is estimated to be worse than boulevards and manicured portions of parks. This is due to no previous maintenance and the high proportion of ash trees. Recent experience shows a higher percentage of ash in woodlands than earlier estimated.

individual trees can produce tens of thousands of dollars of benefits to the community. When it comes to environmental and social benefits, tree size does matter as the benefits and value increase with the age, size and health of the trees.

Urban trees within the road allowance are watered in their first year and optimally trimmed on average every 10 years with younger and older trees trimmed more often. Boulevard trees are currently on an average 12 year cycle. Management of Emerald Ash Borer has increased this cycle length. The remaining inventory of trees is not on a planned trimming cycle but is reactive to staff observations of potential hazards and comments or complaints from the public. There are currently no other routine programs for pests, insects, diseases or other maintenance activities, such as watering or fertilizing.

Forecasted Infrastructure Gap – Urban Forestry

Figure 37 - Forecasted Infrastructure Gap – Forestry



Forestry has a $0.6 Million infrastructure gap growing to $9 Million over the next decade. Historically trees were not considered as infrastructure and renewal plans were minimal. The area has a long history of underfunding and loss of inventory. Today renewal plans for woodlands and wooded portions of parks are just beginning to be recognized in the budget process. The City relies on woodlands to regenerate, however that can be challenging when considering encroachment and factors like Emerald Ash Borer. Consideration of trees as infrastructure is a major step forward in preserving the health of this asset group.

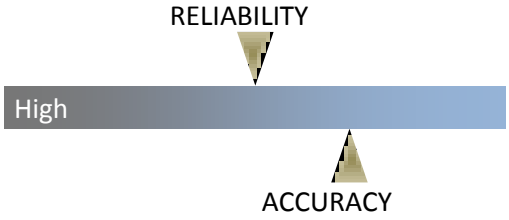
Often the replacement of the street trees occurs in conjunction with the replacement of other assets. The existence of a good tree does not prevent a new road or development from being built or a broken water pipe from being repaired. Efforts are made to replace the impacted tree as part of the project. More attention is also being paid to the tree as an important part of the infrastructure. This is evidenced by the latest rebuild of Horton Street with treed center islands. Although there is some positive news, independent tree removals and replacements will result from other environmental, age,

health, insect and disease factors that are not associated with and paid for within a project. Non-project tree replacements may be funded through separate capital budgets but are currently not sufficient to cover all the losses. In the end, the overall trend is a reduction in tree inventory in London as evidenced by the gap results.

Conclusion – Urban Forestry

Valued at over $500 Million, the City's forestry assets are overall in **Fair** to **Good** condition. Data regarding the City's tree inventory and condition is limited. The full impact of Emerald Ash Borer has yet to be realized and it is anticipated that the condition of wooded areas will be reduced as better information becomes available. The current and future gap means that under current funding plans, the number of trees in London is expected to continue to reduce along with the benefits they provide for air and water quality, habitat, and recreational uses. The City intends to complete the Urban Forest Strategy in 2014 which will be in support of the Official Plan and will identify tree cover targets as well as policies, guidelines and practices that will govern the management of the urban forest for the next twenty years reversing current trends. It is critical that the City invest the necessary resources to implement the strategies if current trends are to be reversed.

City of London Urban Forestry Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$513,300,000		**$ 637,000**	**$ 9,070,000**



Section 5: Protective Services

Picture 65 Fire Station No. 1

Picture 66 Fire Station No. 4

Section 5: Protective Services

Fire

The primary focus of the City of London Fire Department (LFD) is to protect the safety, health and wellbeing of London's citizens, visitors and business through three (3) lines of defence: fire safety education, fire prevention and fire and rescue services. Its services primarily focus upon Council's Strategic Priority of "A Caring Community". Responding on average to approximately 8,500 calls per year; Fire and Rescue Services protect the citizens of the City of London from fire, extricates and rescues individuals when required, respond to speciality emergency calls such as hazardous materials, technical rescue and water and ice rescues, as well as responds to cardiac emergencies and natural and human-made emergencies. Furthermore, the LFD also provides mutual and automatic aid when needed to London's neighbours. To support these services the City maintains an array of facilities, vehicles and equipment, valued at just over $66 Million. These assets range from specialized stations and training facilities, a myriad of fire and rescue vehicles, specialized equipment, and emergency apparel, to more common assets such as passenger vehicles (cars, vans, pickup trucks and trailers). Unlike other City of London service areas, Fire is responsible for maintaining their own fleet and equipment.

INSURANCE AS WE KNOW IT TODAY CAN BE TRACED TO THE GREAT FIRE OF LONDON, WHICH IN 1666 DEVOURED 13,200 HOUSES. IN THE AFTERMATH NICHOLAS BARBON OPENED AN OFFICE TO INSURE BUILDINGS. IN 1680, HE ESTABLISHED ENGLAND'S FIRST FIRE INSURANCE COMPANY, "THE FIRE OFFICE," TO INSURE BRICK AND FRAME HOMES.

Asset Inventory & Valuation – Fire

Table 24 – Asset Inventory Summary – Fire [25]

Asset Type	Asset	Inventory	Unit	Replacement Value ($000's)
STATIONS & FACILITIES	Fire Stations	14	Ea.	$38,856
	Training Tower	1	Ea.	
	Training Building	1	Ea.	
	Storage Garage	1	Ea.	
	Fueling Station	1	Ea.	
VEHICLES & EQUIPMENT	Fire Rescue Vehicles and Heavy Equipment	35	Ea.	$16,025
	Light Fire Vehicles	40	Ea.	$1,140
	Fire Fighting Apparel and Light Equipment	Not Specified - Mix		$10,135
TOTAL				$66,156

[25] Note that land is excluded from this asset pool and dealt with in the Land section.

Stations and Facilities consist of 14 central and neighbourhood fire stations, 1 training centre which includes a training tower and an administrative wing onto Station 9 housing a classroom, administration facilities, as well as 2 support facilities; a fueling station and a storage garage. Station 2 is also unique in that also includes the LFD's Apparatus Division. The triple bay, double deep garage facility is used to repair and maintain the large fleet of vehicles, trailers and specialized firefighter equipment used in the delivery the various services.

Fire Rescue Vehicles & Heavy Equipment are comprised of a variety of Engines, Pumper Rescues, Quints, Aerial Ladders, an Aerial Platform, Tankers and a Rescue Truck, as well as specialized Technical Rescue, Hazardous Material and Water/Ice Rescue units. **Light Fire Vehicles** consist of standard cars, trucks and vans for administrative, service, inspection and public education use, although two (2) of the pickup trucks are dedicated for the delivery of frontline fire and rescue services. **Fire Fighting Apparel & Light Equipment** is made up of a vast array of specialized personal protective, firefighting and rescue equipment.

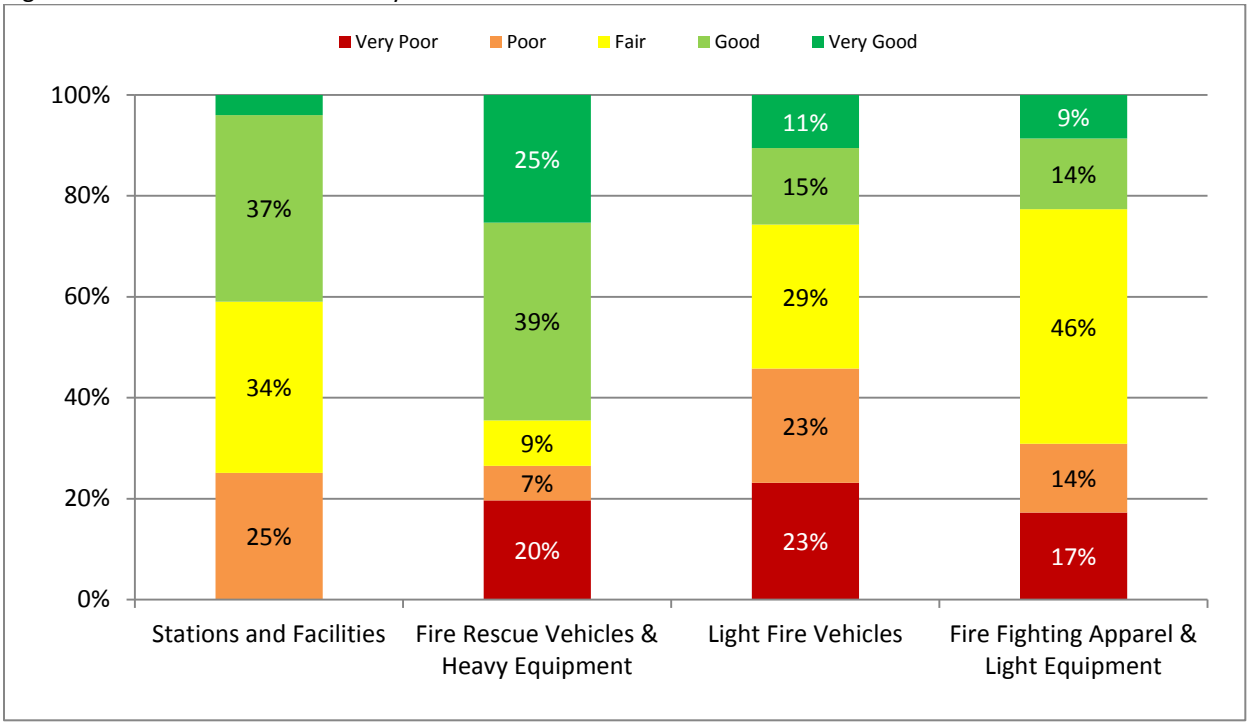
Buildings are maintained by Corporate Facilities. Condition is evaluated on a rotating basis using a standard approach and rating system. Deficiencies are identified and scheduled for resolution through capital and operating investments. Care is taken to maintain mission critical assets impacting the delivery of front line service.

Equipment and vehicle assets are managed centrally by the Apparatus Division of the London Fire Department. Under its current preventative maintenance program, every front line fire and rescue vehicle is inspected and maintained monthly thereby ensuring that any issues are addressed before they occur. Further to these quick inspections, every vehicle undergoes a more comprehensive inspection every six (6) months, as well as annually, the latter as required by the Ministry of Transportation. The condition of these assets is solely tied to age and expected useful life and not an assessment of the actual condition of the assets. Replacement dates and maintenance regimes are set when assets are brought into inventory. Assets are maintained in serviceable condition, with replacement occurring on a planned basis as assets reach the end of their useful life. Where practical, retired assets are sold off and the associated proceeds used to offset the purchase of new equipment. Where retired assets are older such as the 20 year life cycle for heavy vehicle set by Council, the proceeds from recent sales have been minimal.

Picture 67 Fire Engine

Asset Condition – Fire

Figure 38 - Asset Condition Summary - Fire



Stations and Facilities (Buildings) are in **Fair** to **Good** condition. Investment needs are identified and prioritized based on service impact, and addressed operationally and through capital renewal. The ratings presented represent the physical condition of the building and not a representation of the functionality required to satisfy Fire & Rescue's requirements (i.e. size, location, ability to accommodate certain types of crews or equipment). It is important to note that while the condition of the existing Station 7 and Station 11 are included in the assessment, the Council funded relocation of Station 7 is well underway. Furthermore, Council has also approved the relocation of Station 11.

Fire Rescue Vehicles & Heavy Equipment are largely shown to be in **Good** condition. Figures presented are based on age and expected useful life estimates for each unit, and not on formal condition assessment and maintenance review records. Given their critical nature these assets are rigorously maintained to support the reliable delivery of front line service. They receive monthly and more rigorous biannual and annual inspections. That being said, a 20 year life cycle in a large municipal fire department is pushing the envelope and once the vehicles near this age, the risk of failure increases significantly. Where assets are no longer capable of meeting the life cycle requirements, they are flagged for reassignment or replacement. Council has directed the department to

Picture 68 Fire Station No. 14

maintain the use of front line vehicles for 20 years; 17 years spent in front line service and an additional 3 years spent as reserves. The term reserve is a bit of a misnomer as reserve vehicles are often used on a daily basis to replace vehicles being serviced. It is possible that reserve vehicles could see as much if not more use than vehicles assigned to stations with a lower number of alarms.

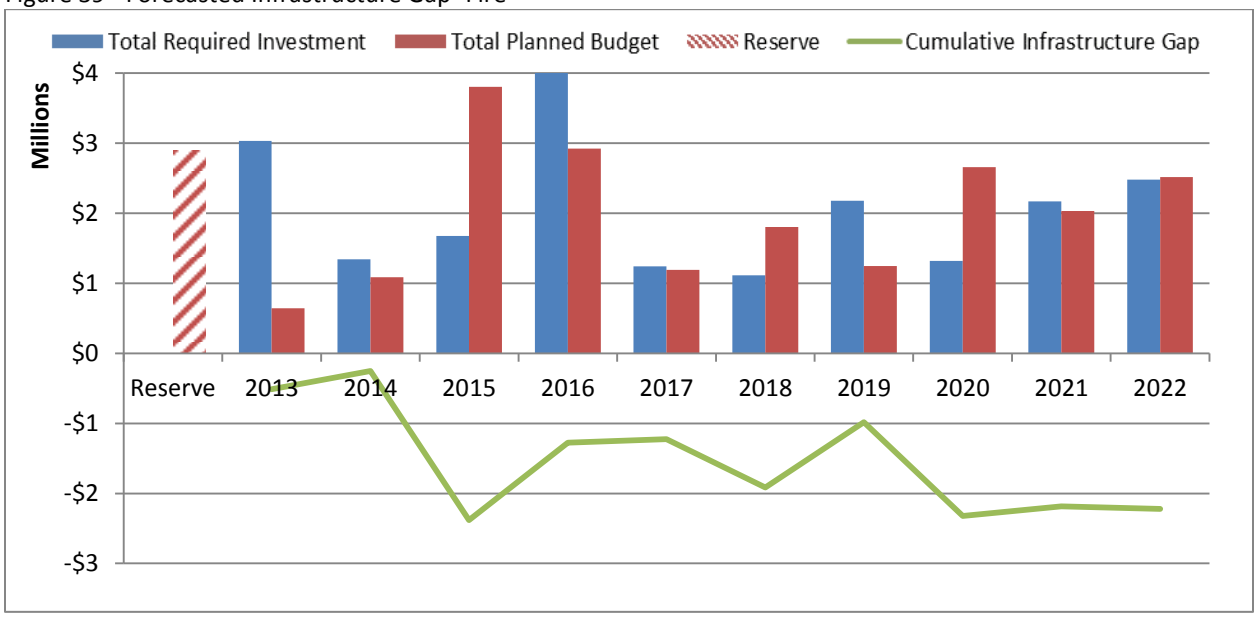
Light Fire Vehicles are shown to be in **Fair** condition. The Fire service applies a longer estimated useful life to these assets than other City service areas. Through low use, diligent staff maintenance and constant assessment, these vehicles last longer than within other London services. This inventory approach potentially reduces the amount of funding recovered through sale of the vehicle at the end of its useful life but can be argued as warranted given the low use and overall condition of the vehicles.

Fire Fighting Apparel & Light Equipment is listed in **Fair** to **Good** condition based solely on age and expected useful life. As with Fire Rescue Vehicles & Heavy Equipment, these assets are rigorously tested and maintained to support the reliable delivery of front line service. Assets no longer capable of meeting these requirements are flagged for replacement. Assets due for replacement per regulation are removed from service and replaced. The department has included in its capital plan replacement of this equipment on an ongoing basis.

This assessment of Fire's assets relies heavily on age and estimated useful life and not a standardized formal conditional assessment. Further investigation is needed to determine the condition of Fire's asset base with greater accuracy.

Forecasted Infrastructure Gap – Fire

Figure 39 - Forecasted Infrastructure Gap- Fire



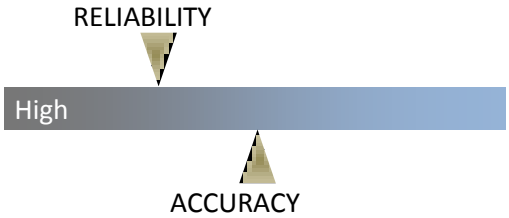
Evaluating required investment versus planned budget illustrates that Fire does not have an infrastructure gap. It is expected that current budget projections will be sufficient to fund future infrastructure requirements. This assessment does not consider growth, inflation or changes to service.

Over the past decade, the City has taken significant steps to improve coverage and service with the addition of new, more versatile stations and equipment. Fire & Rescue has developed a ten year plan that defines the investments needed to support ongoing facility improvements. The City is also in the process of moving away from single purpose Fire Engines and dedicated Rescue Units to using multi-purpose vehicles capable of providing more operational flexibility, resiliency and depth of coverage; resulting in a change of the configuration of the Fire fleet. Fire vehicle replacement is financially supported by a dedicated vehicle replacement reserve fund. Provided the existing plans are adhered to, Fire's assets are well positioned to support service delivery over the coming decade.

Conclusion – Fire

Valued at approximately $66 Million, the City's Fire & Rescue assets are overall in **Fair** condition, indicating that they are meeting the City's immediate needs. Maintaining current investment plans will result in a sustainable asset base over the next decade. Additional effort in the evaluation of long-term investment requirements, particularly around vehicles and heavy equipment is required. Further investment will also be needed to accommodate growth and service improvement through the addition of new facilities, equipment and technology.

City of London Fire Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$ 66,156,000		**No Gap**	**No Gap**



Section 6: Social and Health Services

Picture 69 Dearness Home – Wellington Rd. and Southdale Rd.

Picture 70 Dearness Home Entry

Section 6: Social and Health Services

Long Term Care

Dearness Home is a long-term care home, owned and operated by the City of London. Dearness Home provides long term care services to 243 residents from the London-Middlesex area by providing respite, medical, nursing, personal, therapeutic and social work services. Dearness Home promotes the well-being of individuals and families by providing a safe, secure, comfortable and caring community in which to live.

GIVEN A WORKING CAREER OF 45 YEARS, AT ANY GIVEN TIME, THE RESIDENTS OF DEARNESS REPRESENT AN ESTIMATED TOTAL WORK EXPERIENCE OF 10,935

The assortment of services offered by Dearness is second to none. The needs of residents for short or long term care in private or standard rooms are met in one of the 9 Resident Home Areas. Dedicated staff and volunteers make residents' physical, emotional, social and spiritual needs their first concern. In fact, with about 350 volunteers, the ratio of volunteer time per resident is one of the highest in the area.

Asset Inventory & Valuation – Long Term Care

The City of London owns and operates the Dearness Home facilities that have a current replacement value of $45.6 Million. The services provided at the facility, which enjoy a 94% resident satisfaction rate, include: primary care and personal support, including provision of nutritious meals and snacks; therapeutic, recreational, social and spiritual services; medical services; nursing services; and supportive therapies.

Table 25 – Asset Inventory & Valuation – Long Term Care Facilities

Asset Type	Asset	Inventory	Unit	Replacement Value ($000's)
LONG TERM CARE FACILITIES & EQUIPMENT	Dearness Retirement Home	1	Ea.	$45,593
TOTAL				$45,593

Asset Condition – Long Term Care

The City's Facilities Division is responsible for maintaining and operating the Long Term Care facilities in compliance with the Long-Term Care Homes Act, Provincial regulations and safety standards.

The condition of the buildings are regularly evaluated through comprehensive condition assessments, which establishes and updates an industry-standard Facility Condition Index (FCI) score that reflects accurately the overall condition of the

Picture 71 Dearness Home Internal Hallway

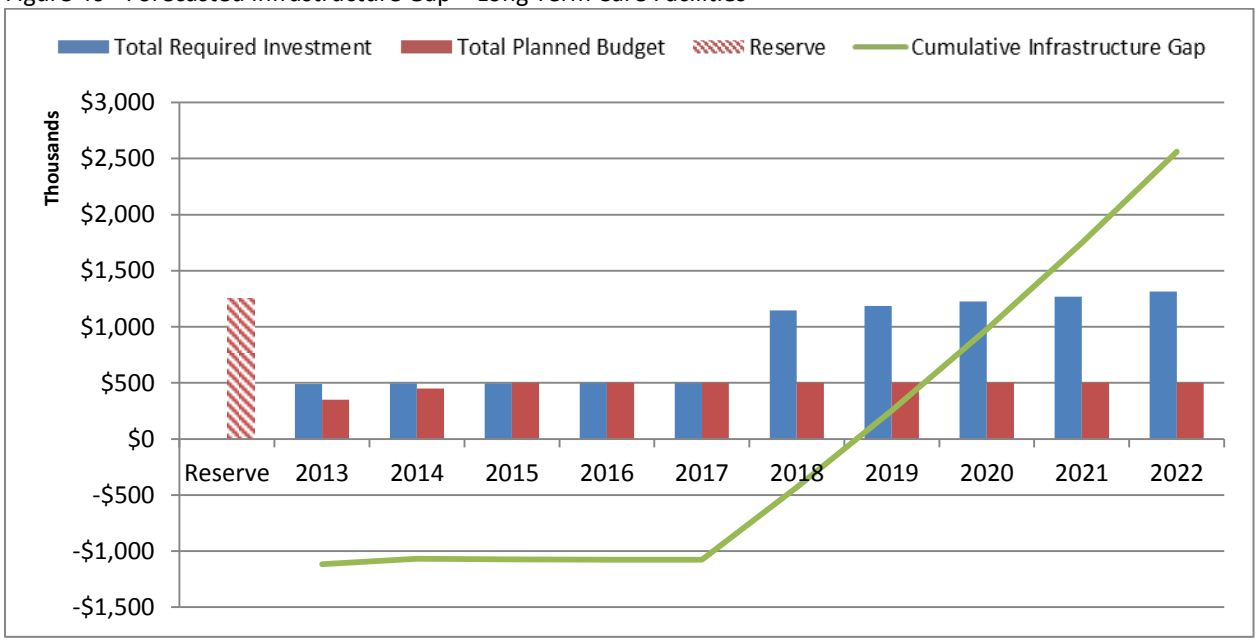
facilities (building envelope, mechanical and electrical systems, etc.).

Dearness does not have asset management capability with respect to its other assets like beds and lifts, etc. Although minor in value compared to the other City of London assets, Dearness provides a critical service and would benefit from a formal asset inventory and management system regarding the assets beyond the actual buildings.

The Dearness Home Retirement Home is shown to be in **Good** condition, reflects the fact that the facility was built in 2005, and the original structure and major components of the building are still relatively new.

Forecasted Infrastructure Gap – Long Term Care

Figure 40 - Forecasted Infrastructure Gap – Long Term Care Facilities

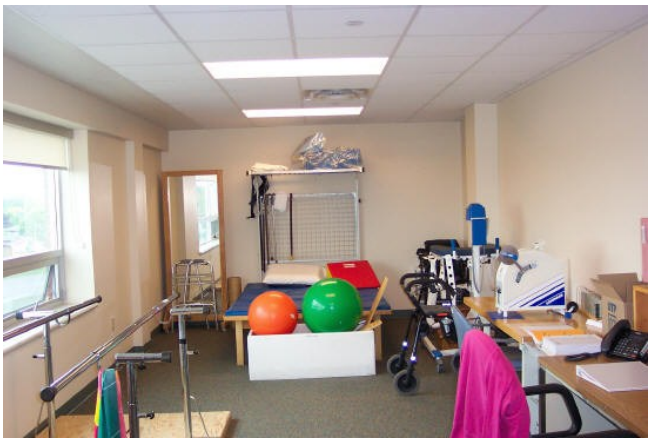


While there is no current infrastructure gap, the gap is expected to grow to $2.6 Million over the next decade; primarily driven by the need to renew the Dearness Retirement Home. The full contents of the home are not included in asset calculations and may elevate the gap. The Long Term Care gap is low because the facility is relatively new. Accuracy could be improved through robust asset information.

The City has set aside a reserve fund dedicated to future major upgrades and renovations needed for the facility. While the current condition is **Good**, and despite the $1.2 Million Reserve Fund set aside, an analysis of the required investment vs. planned budget, evaluated by projected facility condition index into the future, shows that an Investment gap will appear in 2019 and will grow to about $2.6 Million by 2022. As the building ages and critical components start failing, a significant increase in maintenance investment will be required that is not currently in the budget forecast. Also excluded from the forecast are any costs associated with potential future changes such as accommodating the growth in demand for additional retirement accommodation, for the expansion of the range of services provided, of for the adoption of new equipment.

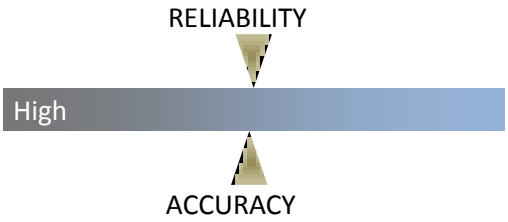
Conclusion – Long Term Care

Valued at nearly $45.6 Million, the City's Dearness Retirement facility is overall in **Good** condition, indicating that sufficient investments have been made in the past to maintain this facility. However, maintaining current investment will result in a $2.6 Million investment gap over the next decade, resulting in a degradation of the service delivered to the Residents. Failure to address the infrastructure gap will, in the long term, impact the quality of life for the residents and potential result in the City failing to comply with the regulations. Further investment may also be needed to accommodate growth and service improvement through the expansion of the facility.



Picture 72 Dearness Home Therapy Services

City of London Long Term Care Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$ 45,593,000		**No Gap**	**$ 2,562,000**



Section 7: Corporate, Operational & Council Services

Picture 73 City Hall from Reg Cooper Square

Section 7: Corporate, Operational & Council Services

Corporate and Culture Facilities

THE SQUARE FOOTAGE OF BUILDINGS USED FOR ADMINISTRATION, OPERATIONS AND CULTURE COVERS MORE AREA THAN 8 CANADIAN FOOTBALL FIELDS…

The City of London owns and operates hundreds of facilities as part of its built environment. These facilities are used to provide the wide range of services offered by London. They support service delivery by providing safe and efficient work and meeting places for use by City of London staff, Council, Boards and Com missions, and members of the public. The Facilities Division manages and maintains these assets, allowing them to meet the City's functional requirements, and building and safety codes, while operating in a safe and efficient manner. The majority of facilities inventory include buildings which are individually used for the service they provide like recreational arenas and are budgeted within their service area. For the purpose of this report, their inventory has been included in their specific service area section while this section deals with the remainder and provides a brief summary of Facilities Division.

Picture 74 AJ Tyler Bathurst Operations Centre

This section of the facilities inventory is divided into two areas; Corporate Facilities and Culture Facilities. Corporate Facilities include general service facilities such as administrative buildings (City Hall, etc.) and operations centers (A. J. Tyler, etc.) that are used by several different service areas. Culture Facilities are very different in that each facility may have a different management approach. By default the City's Culture Office manages these facilities, deals with third parties and addresses any major maintenance and other issues.

Asset Inventory & Valuation – Corporate and Culture Facilities

The City of London owns and operates a collection of 49 office, administrative, storage and culture facilities valued at approximately $181 Million located throughout London. The administrative buildings provide space for staff work stations, equipment, and material, provide modern and effective meeting places, and support the City in delivering front-line and administrative services. Operations Centres focus on maintenance and provide garages, workshops, storage and operations administration. The Culture category includes several cultural sites, contributing to local tourism, learning and public enjoyment. Some administrative buildings also have heritage status like the J. Allyn Taylor building but are grouped in administrative for the purpose of this inventory.

Table 26 - Asset Inventory & Valuation - Corporate Facilities

Asset Type	Asset	Inventory	Unit	Replacement Value ($000's)
CORPORATE FACILITIES	Administration Buildings	4	Ea.	$117,241
	Main Centres	22	Ea.	$32,291
	Other	9	Ea.	
CULTURE FACILITIES	Heritage	13	Ea.	$31,471
	Arts & Entertainment	1	Ea.	
TOTAL				**$181,003**

The majority of the estimated replacement value for Corporate Facilities assets resides in the four administrative buildings, which include City Hall, the City Hall Parking Building, the J. Allyn Taylor Building, and the POA Court House. The larger operations centers include A.J. Tyler, Oxford, Adelaide, and Exeter Road. Other Corporate Facilities include assets such as salt domes and storage buildings.

Culture Facilities include heritage buildings such as Eldon House, Elsie Perrin Williams Estate and Flint Cottage, and one arts & entertainment venue, Centennial Hall. The City's Facilities Division is responsible for maintaining the majority of these facilities in compliance with Provincial regulations and safety standards while the users are responsible for use of the facility and delivery of the service they provide. For some Facilities like Centennial Hall, Grosvenor Hall, etc., the Facilities Division deals with major maintenance like roof replacement while a third party is responsible for the use, operation and minor maintenance. Generally the terms are specified in agreements or contracts. This report excludes buildings fully under the control of Boards and Agencies like Museum London or the Convention Center.

Asset Condition – Corporate and Culture Facilities

The condition of Corporate and Culture facility assets is regularly evaluated through comprehensive condition assessments, which establish and update an industry-standard Facility Condition Index (FCI) that reflects the overall condition of the facilities (building envelope, mechanical and electrical systems, etc.). There is no assessment or inventory value for cultural building contents or outdoor amenities such as public art or landscape sites (e.g. Western Counties Health and Occupational Centre grounds). However the City's Culture Office is currently developing a cultural asset inventory which includes public art.

Figure 41 - Asset Condition Summary – Corporate Facilities

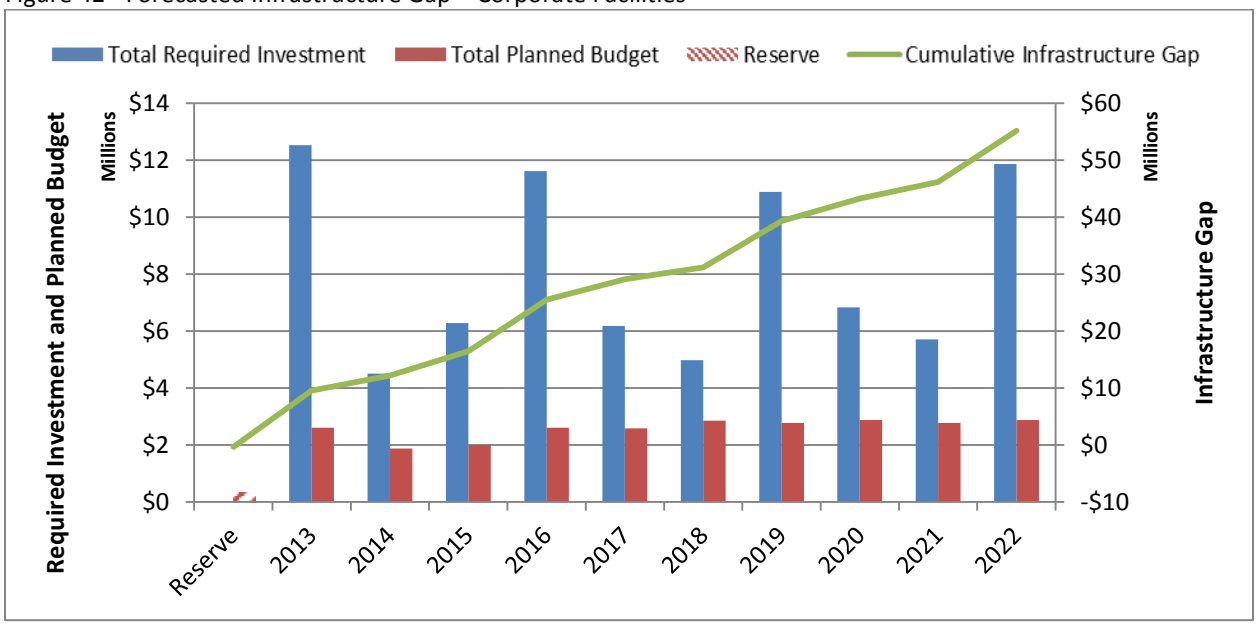
Administration Centres are shown to be in **Poor** condition, which is largely driven by significant short-term investments required at City Hall and within its adjacent Parking Facility. Similarly, nearly 80% of **Operation Centres** are listed in **Fair** to **Poor** condition, indicating significant investment will be required to maintain the safety and functionality of these facilities over the next decade.

Culture Facilities are shown to be in **Fair** to **Good** condition indicating that they are meeting current requirements, but many are starting to show signs of deterioration. The focus of the Facilities condition rating system is on external appearance and structural soundness. The interior condition of the buildings may not be kept at the same level. Barring investment recommended through the condition assessment program, these facilities will continue to deteriorate, and could experience intermittent closures for maintenance and repair. Centennial Hall in particular has been the subject of much

discussion concerning the need for a replacement. A 2007 analysis by Novita Interpares Limited recommended a phased decommissioning of Centennial Hall by 2016. Performing Arts Center discussions continue and the future of Centennial Hall has yet to be determined.

Forecasted Infrastructure Gap – Corporate Facilities

Figure 42 - Forecasted Infrastructure Gap – Corporate Facilities

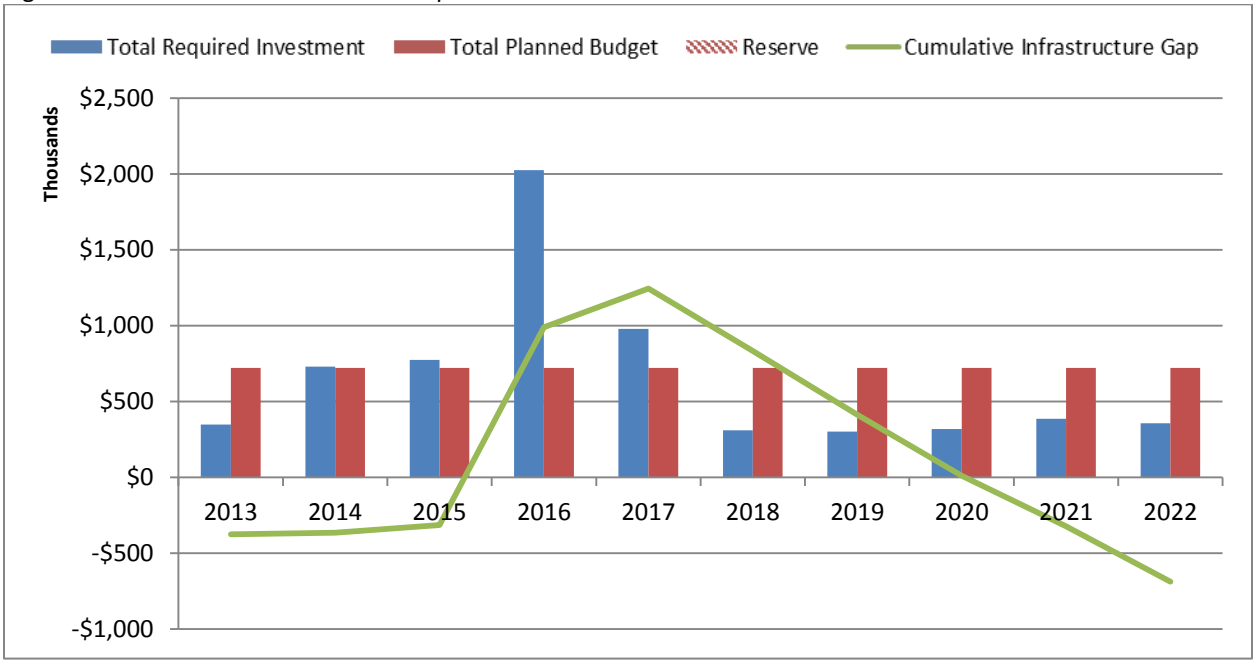


An analysis of the required investment versus planned budget shows that the **Corporate Facilities** infrastructure gap will increase to approximately $55.2 Million over the coming decade, largely driven by significant investment requirements at City Hall. The infrastructure gaps are based on data derived from the regular facilities condition assessment program with a maximum acceptable Facility Condition Index of 10%. Total required investment represents the costs to renew and maintain the existing assets so services can continue to be delivered. The forecast does not account for any costs to improve service, accommodate growth or expand service to new areas or customers.

Picture 75 Exeter Road Operations Centre

Forecasted Infrastructure Gap – Culture Facilities

Figure 43 - Forecasted Infrastructure Gap – Culture Facilities



An analysis of the required investment versus planned budget shows that the **Culture Facilities** infrastructure gap will peak midway through the coming decade before declining. Total required investment represents the costs to renew and maintain the existing assets so services can continue to be delivered. The forecast does not account for any costs to improve service, accommodate growth or expand service to new areas and customers or any special protection needed for cultural assets. Although most of the buildings in the Culture inventory are reasonably sustainable, the fate of Centennial Hall remains an outstanding decision. Further discussion is expected over the next few years.

Picture 76 Centennial Hall

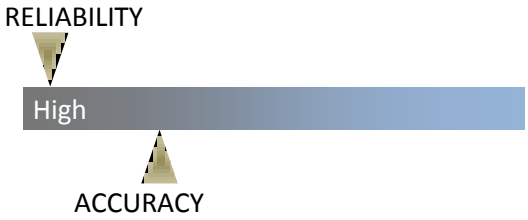
Picture 77 Eldon House

Conclusion – Corporate and Culture Facilities

Valued at roughly $150 Million, the City's Corporate Facilities primarily City Hall and its Parking Structure are overall in **Poor** condition, indicating that these facilities are in need of significant lifecycle renewal investments. Increased investments over the past few years have helped extend the lives but have not been able to eliminate the gap. Based on current investment, if the City's Corporate Facility assets are not replaced / renewed, this gap will continue to grow, resulting in localized reductions to service. These may include increased maintenance costs, localized closure, relocation, inconvenience to staff, increased parking fees, operational inefficiencies, etc.

The City's Culture Facilities, valued at approximately $31 Million, are overall in **Fair** to **Good** condition. This data focuses on Culture Facilities described in the scope of this section and does not include the greater inventory of Culture assets which is currently under development. Failure to maintain cultural assets would result in irreplaceable loss of history to Londoners. As culture inventory becomes available a better understanding of all Culture assets and the associated infrastructure gap will result.

City of London Facilities Infrastructure				
	Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
CORPORATE	**$ 149,532,000**		**$ 9,589,000**	**$ 55,199,000**
CULTURE	**$ 31,471,000**		**No Gap**	**No Gap**

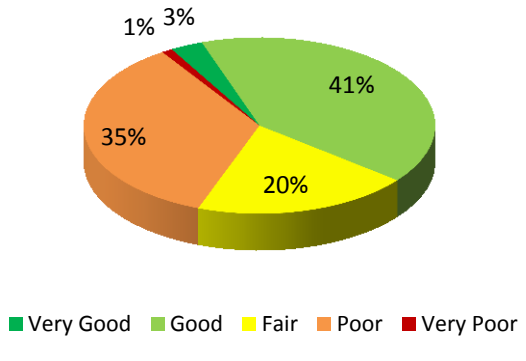


City of London Facilities Division - Aggregate

This report identifies facilities the City's individual service areas use to provide services. For over 200 buildings valued at approximately $500 Million as shown in Table 27, the structure and equipment of the building fall under the custody of the Facilities Division. It should be noted that Facilities Division also has responsibility for facilities outside the scope of this report such as Libraries, Museum London, etc. The City generally budgets within service areas when constructing a new or modifying an old facility. Where needed, projects are constructed using the Facilities Division as the Project Manager. Once built these buildings become the budget responsibility of the Facilities Division for operating, maintenance and capital works.

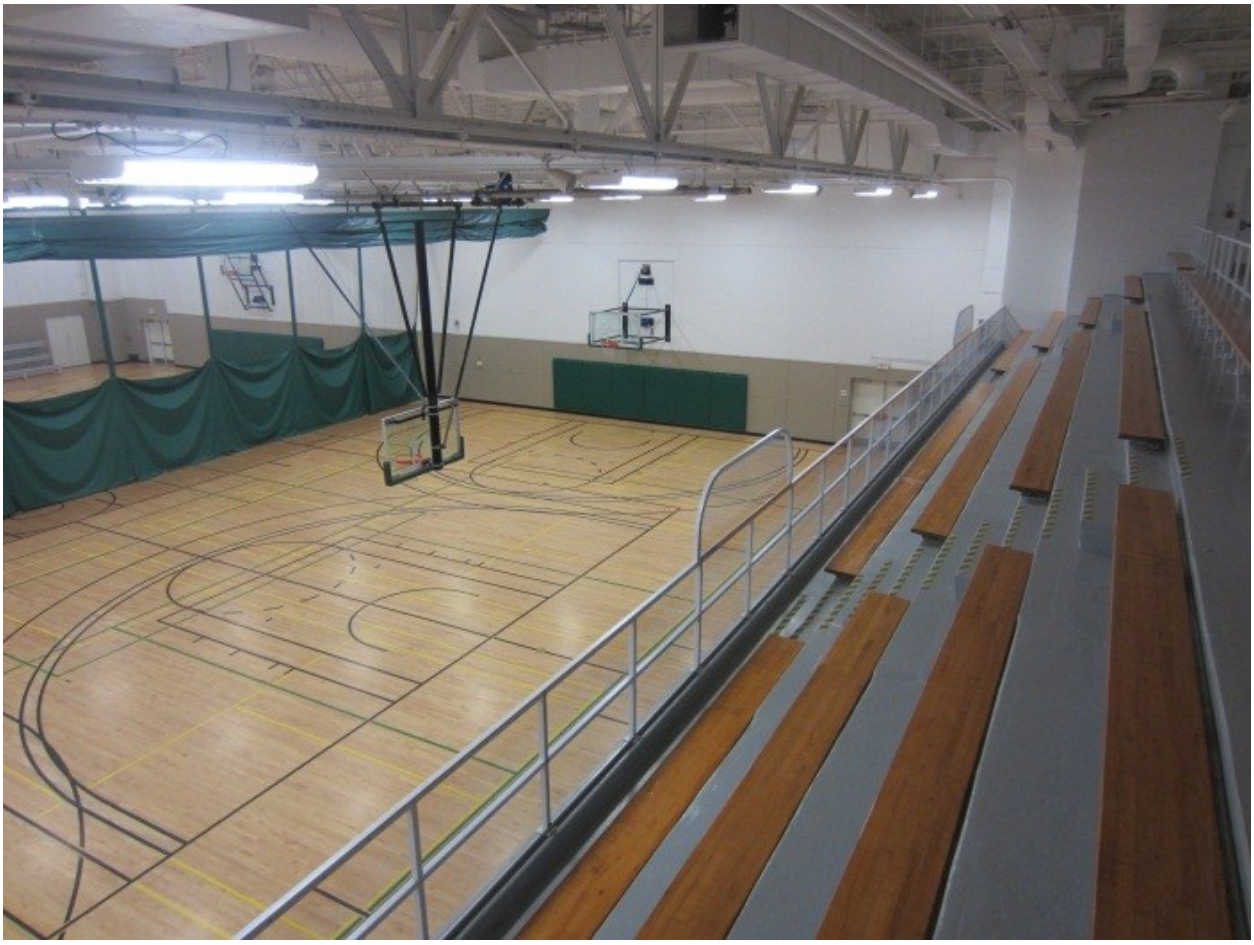
The facilities under custody of the Facilities Division are generally in **Fair** condition with equally significant portions showing in Poor and Good condition. The high percentage of facilities in Poor condition is reflective of the needs within the Corporate Administration and Operation Centre building categories. The large portion of facilities in Good condition is generally a reflection of the condition of Parks, Recreation, Long Term Care, Culture and Fire Station facility assets.

Table 27 - Facilities Division Core Service Aggregate

Facility Asset Type	Replacement Value ($000's)	Infrastructure Gap	
		Current ($000's)	10 Years ($000's)
RECREATION FACILITIES	$218,374	$0	$2,300
CORPORATE FACILITIES	$149,532	$9,589	$55,199
LONG TERM CARE FACILITIES	$40,691	$0	$0
FIRE STATIONS & FACILITIES	$38,856	$0	$0
CULTURE FACILITIES	$31,471	$0	$0
PARK FACILITIES	$20,621	$226	$2,279
TOTAL	**$499,545**	**$9,815**	**$59,778**
Overall Facility Condition (by Replacement Value)			

The current infrastructure gap for buildings that must be addressed in the Facilities Division budget is estimated at $9.8 Million and is expected to grow to approximately $59.8 Million over the next decade. This includes only the building envelope and its major equipment such as electrical, mechanical, HVAC, etc. It does not include any of the specialized equipment related to the service area use such as ice resurfacing machines, compressors, pool equipment, kitchens, hoists, etc. The general purpose facilities life cycle reserve fund ($9.9 Million balance as at December 31, 2013) is available to help address required investments across all of the assets that fall under the custody of the Facilities Division. The infrastructure gap forecast does not account for any costs to improve service, accommodate growth or expand service to new areas or customers.

This section of the Corporate Facilities chapter presents the aggregate of the facilities that fall within the custody of the Facilities Division; thereby presenting the City of London's overall facilities requirements in Parks, Recreation, Long Term Care, Fire, Corporate Administration and Culture. Note that further information is found in the service area sections.



Picture 78 Carling Heights Optimist Community Centre Gymnasium

Section 7: Corporate, Operational & Council Services

Fleet

Fleet vehicles and equipment are one of the critical building blocks used by the City of London to provide services to its citizens. Fleet assets range from garbage packers to road plows to cars to turf mowers. Virtually all outdoor mobile equipment is included in this asset group plus some indoor equipment like ice re-surfacers. Some of this equipment is highly specialized like sewer hydro excavation and pavement line marking equipment. Fleet equipment needs to be safe, sustainable, flexible and reliable.

OUR FLEET MECHANICS WORK ON MORE THAN 100 DIFFERENT TYPES OF VEHICLES…

Picture 79 Fleet: Line Marking Vehicle

The current value of Fleet vehicles and equipment is approximately $45 Million. The City of London owns the Fleet assets and provides storage, maintenance, fueling and administrative services through the custody and expertise of Fleet Management Services.

Asset Inventory & Valuation – Fleet

Table 28 - Asset Inventory Summary- Fleet[26]

Asset Type	Asset	Description	Inventory	Unit	Replacement Value ($000's)
VEHICLES	Light Vehicle	Cars, Mini Vans, SUV's, pick-ups	227	Ea.	$5,600
	Medium Vehicle	350 and 450 Series Utility Trucks, Small Ariel Units	17	Ea.	$1,005
	Heavy Vehicle	>40' Aerial Lift Units, Garbage Packers, Dump Trucks	130	Ea.	$18,638
	Heavy Vehicle (Off Road)	Sewer Cleaner, Sewer Vacuum, Street Sweepers and Flushers, HXX	19	Ea.	$4,952
EQUIPMENT	Light Equipment	Trailers, Plow Blades, Line Painters, Trailer Tool Boxes	83	Ea.	$336
	Light Equipment (Off Road)	Job Trailers, farm Tractors, Trackless Attachments, Mowers < 72"	637	Ea.	$3,568
	Medium Equipment	Snow Plow Blades and Wings, Float Trailers	42	Ea.	$1,424
	Medium Equipment (Off Road)	Trackless S/W machines, Mowers >72"	101	Ea.	$5,849
	Heavy Equipment	EPOKE Road Sander Spreaders	9	Ea.	$1,129
	Heavy Equipment (Off Road)	Front End Loaders, Road Graders	14	Ea.	$2,493
TOTAL					**$44,994**

The Fleet Division assigns equipment and vehicle assets to individual service areas but manages them for all municipal service areas and provides some customized services like providing fuel to Fire, diesel fleet fuelling and some welding/fabricating and washing to Police, fuel and maintenance to Libraries and full maintenance lease (including capital replacement) to Tourism London and Animal Care and Control. The Fleet report section deals only with the assets of core City services and not the assets of Fire, Police and Transit. It does include vehicles owned by the City and leased to Boards and Agencies. Assets are maintained in safe, serviceable condition, with replacement occurring on a planned basis as assets reach their optimum life cycle stage or their best economic resale

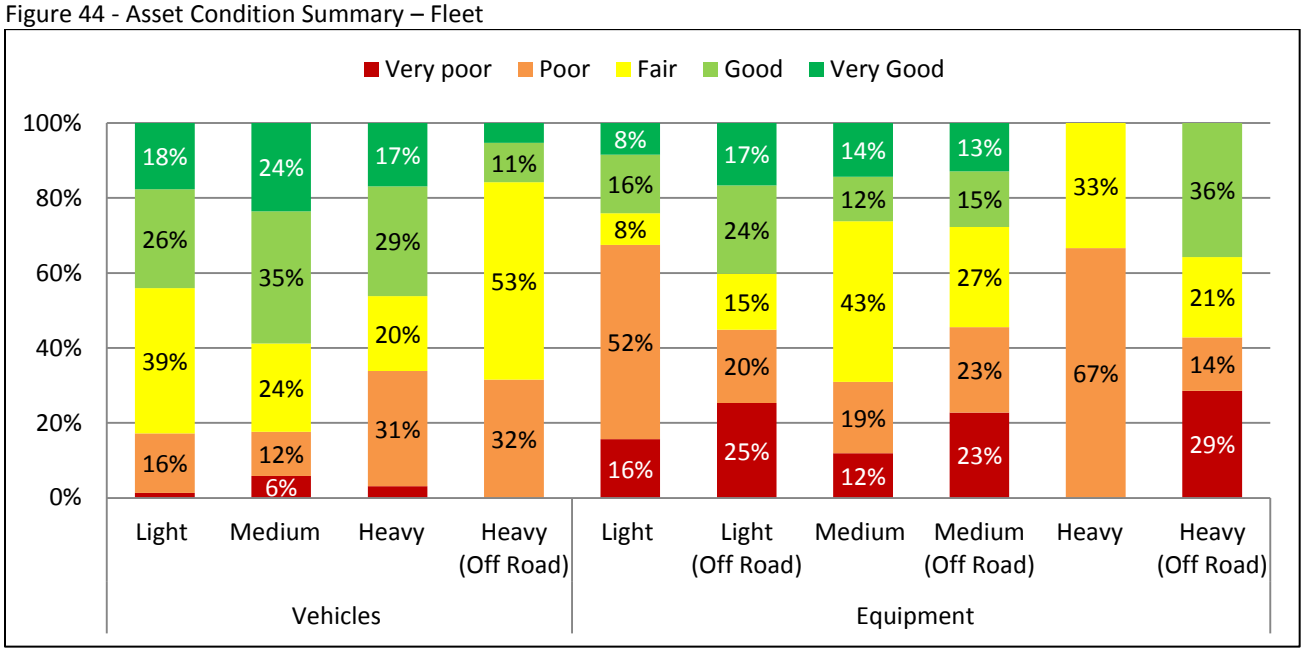
Picture 80 Fleet Heavy Vehicles

[26] Note that administrative, maintenance and storage buildings are maintained by the City's Facilities group.

time. Retired assets are sold off and the associated proceeds used to offset the purchase of new ones.

Asset Condition – Fleet

Figure 44 - Asset Condition Summary – Fleet



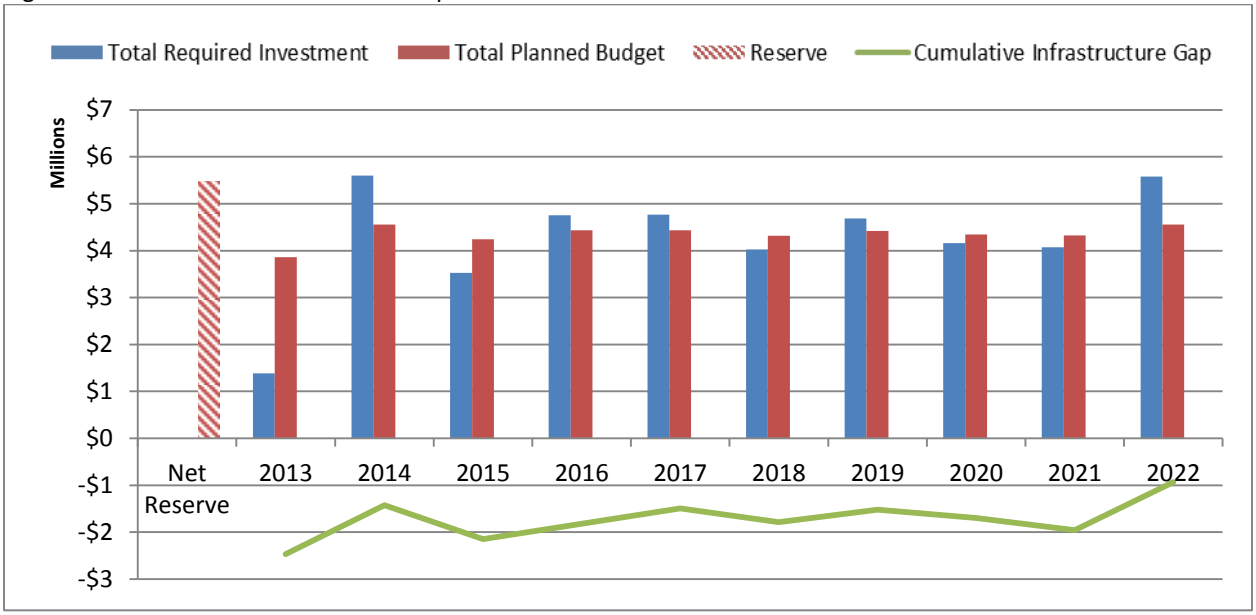
Vehicles represent the biggest value of Fleet assets. They range from standard cars and trucks (Light Vehicles), to utility work trucks (Medium Vehicles), to tandem dump trucks, garbage packers and sewer cleaning units (Heavy Vehicles). Large portions of the City's vehicle fleet are shown as being in **Fair** to **Good** condition, approaching their target replacement date. Sound maintenance practices allow Fleet services to extend the lives of these assets and maintain their serviceability throughout their lifecycle. The City is updating Fleet assets to take advantage of hybrid and emerging technologies.

Equipment ranges from trailers and large manual tools (Light Equipment), to snow plow attachments and mowers (Medium Equipment), to front end loaders and road graders (Heavy Equipment). A large portion of Light Equipment assets are shown to be in **Very Poor** or **Poor** condition. Fleet staff maintains these assets in a safe condition and keep them operational as they age. The large portion of off road heavy equipment in **Very Poor** to **Poor** condition reflects the City's desire to extend the life as long as possible but raises the risk of unplanned replacements and increased maintenance costs typically seen when operating equipment beyond its useful life.

Picture 81 Fleet Vehicles and Equipment

Forecasted Infrastructure Gap – Fleet

Figure 45 - Forecasted Infrastructure Gap



Evaluating required investment versus planned budget shows that the Fleet infrastructure gap will remain stable and slightly negative over the next decade, indicating that funding is appropriate given the City's vehicle and equipment demands. The Net Reserve represents the funding that has been saved towards the future years costs. These savings, along with annual Reserve Fund contributions, are used to fund the Fleet capital budget and address any unplanned renewals. The gross Fleet Reserve Fund balance to start 2013 is approximately $12.9 Million, with $7.4 Million of that balance earmarked to address prior year's capital works. The committed funding is not included in the Infrastructure Gap calculation. The trend presented is driven by sound planning and budgeting founded on a good understanding of the needs of the City's internal customers. Fleet has also taken steps to increase utilization and reduce the number of units by offering shared vehicle solutions across service areas. The availability of funding coupled with the relatively good balance of assets across the condition scales suggests Fleet assets are well maintained, allowing sustained operation while the lives of equipment and vehicles are optimized. Off-road equipment may require further attention and management as the data suggests it is vulnerable to unplanned replacements. Deferring replacements significantly beyond the identified optimum life cycles, increases maintenance costs and risk of failure, reduces salvage values and quite often increases the purchase price of the replacement.

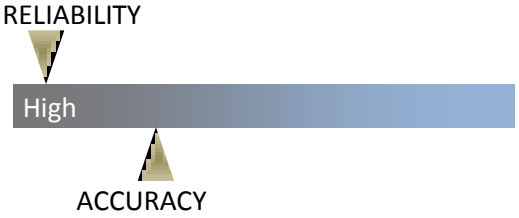
Over the past decade, the City has taken significant steps to improve Fleet vehicle operations and adopt hybrid vehicle technology particularly for the light and medium vehicles groups. Excluded from the forecast are growth and costs associated with future service improvements.

Conclusion – Fleet

Valued at nearly $45 Million, the City's Fleet assets are overall in **Fair** condition, indicating that they are in the middle of their useful lives. Investments in maintenance and sound management practices allow Fleet Management Services to maintain the serviceability of these assets and generally maximize their useful lives. Although there is no current or projected infrastructure gap, failure to continue planned investments in Fleet could result in increased need for new capital and reductions to service such as higher maintenance costs, more vehicle downtime, service disruptions, operational inefficiencies, etc. Funding levels and reserve fund savings are currently sufficient to maintain operations and absorb minor unplanned replacements; resulting in no infrastructure gap for this service area provided the funding strategy remains unchanged.

Picture 82 Fleet Vehicles and Equipment

City of London Fleet Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$ 44,994,000		**No Gap**	**No Gap**



Picture 83 ITS: Dufferin Avenue

Section 7: Corporate, Operational & Council Services

Information Technology

With over $10.9 Billion dollars' worth of assets owned by the City of London, it would not be possible to effectively use and manage our assets and their information without the tools offered through technology. Information and data are strategic business assets. The City of London Information Technology Services (ITS) is responsible for the technology tools used to ensure the safety and protection of the Corporation of the City of London's data, information and computer systems. ITS is an internal service provider that supports City service areas so they can provide services to the public. ITS provides information technology and other technology services to the Corporation as well as the various associated Boards & Commissions. The ITS assets include hardware, software, information and data which they maintain for their use and the use of both internal and external customers.

IN 1980, IBM MADE A DESKTOP WEIGHING 105 LBS. WITH AN EXTERNAL FLOPPY DRIVE WEIGHING 130 LBS. TODAY THE LANDSCAPE IS QUITE DIFFERENT WITH TECHNOLOGY RAPIDLY CHANGING GIVING RISE TO SMALLER AND MORE AGILE PRODUCTS WITH A MUCH SHORTER USEFUL LIFE.

Asset Inventory & Valuation – Information Technology

To support service delivery, the City owns and maintains a large information technology infrastructure, currently valued at $46.1 Million. Through ITS, the City is responsible for maintaining this infrastructure in condition to ensure continuity of service. IT assets include leased and owned assets both of which have been included in this report. These include IT infrastructure, enterprise applications, end user devices and applications and the One Voice communication system hardware needed to deliver internal and external services.

Picture 84 ITS: Mobile Technology

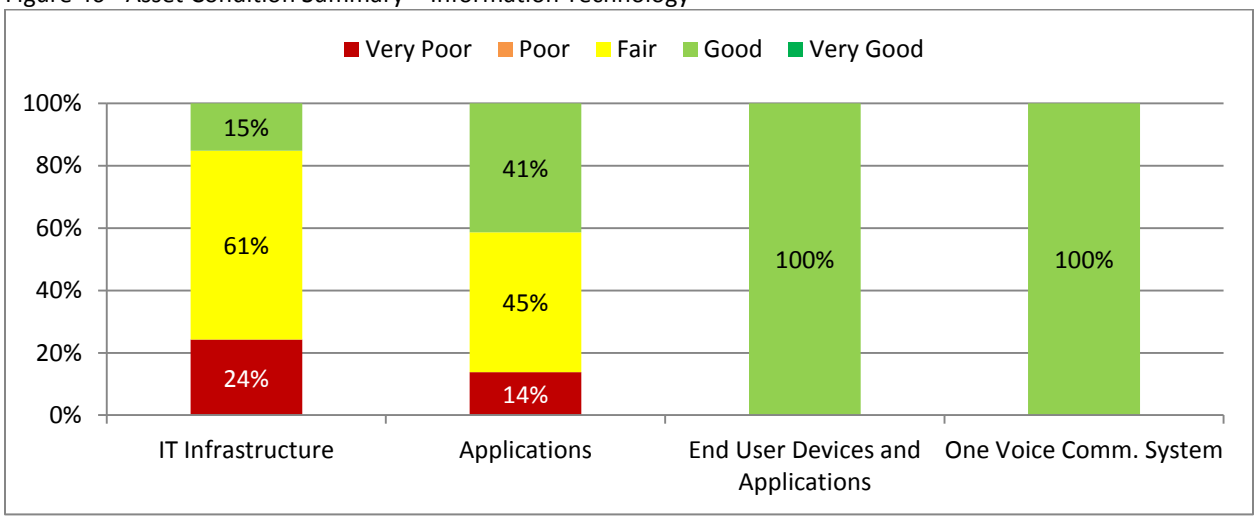
Table 29 - Asset Inventory & Valuation – Information Technology

Asset Type	Asset	Inventory	Replacement Value (000's)
IT INFRASTRUCTURE	Network, access points, switches, routers	Not Specified - Mix	$ 2,000
	Storage system, backup system		$ 2,000
	Servers, blade enclosures		$ 1,000
	Server operating systems		$ 500
	Database engines		$ 1,000
	Fibre network		$ 10,000
ENTERPRISE APPLICATIONS	Enterprise software	Not Specified - Mix	$ 14,500
END USER DEVICES AND APPLICATIONS	Desktops, laptops, iPads, etc.	Not Specified - Mix	$ 5,100
	Blackberry, cellphones, etc.		
	Office productivity software		
ONE VOICE COMM. SYSTEM	Infrastructure	Not Specified - Mix	$ 10,000
	End users devices, communication system, software, etc.		
TOTAL			**$ 46,100**

Based on Generally Accepted Accounting Principles, there is an inferred ownership of the City's leased technology assets requiring they be capitalized and reported under PSAB 3150 legislation. These leased assets include more than 2,500 desktop computers. The rapid evolution of technology like desktops makes leasing the more practical option than outright purchase. Like most corporations the value, condition and gap with respect to the City's soft assets of 'data' and 'information' are not currently assessed nor is any methodology readily available to undertake such an assessment.

Asset Condition – Information Technology

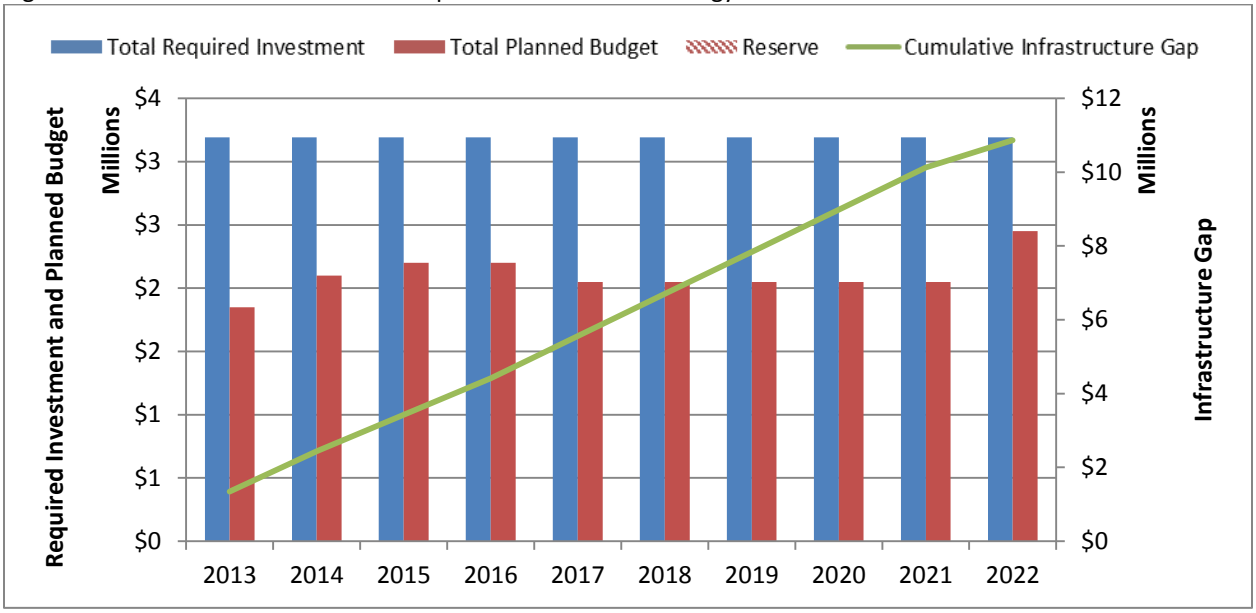
Figure 46 - Asset Condition Summary – Information Technology



The overall condition of the ITS assets is **Fair** to **Good**. Unlike most other types of assets owned by the City, many ITS assets like desktops and printers, have a short estimated useful lives of 3 to 4 years. The condition, highlighted in Figure 43 above, was evaluated based on expert opinion. In future, the Information Technology Asset Management (ITAM) program that is currently under development will provide more robust asset information. Technology asset concerns are captured on a reactive basis through routine maintenance program executions or problems reported by the user to the internal IT Helpdesk. 24% of **IT Infrastructure** is in **Very Poor** condition approaching the end of its useful life. This area will require attention in the near future.

Forecasted Infrastructure Gap – Information Technology

Figure 47 - Forecasted Infrastructure Gap – Information Technology



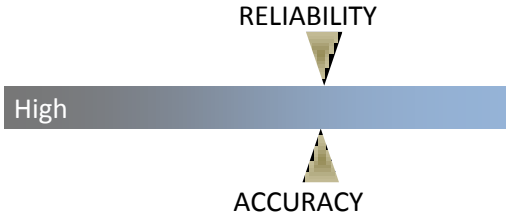
An analysis of the required investment versus planned budget, evaluated based on the estimated useful life of the ITS assets, shows that they will experience a funding gap of approximately $10.9 Million over the next 10 years. The short lifecycle of these assets necessitates constant investment and renewal. Total required investment represents the costs to renew and maintain the existing assets so services can continue to be delivered. The forecast does not account for any costs to improve service, accommodate growth or expand service to new areas or customers noting that ITS assets are strongly impacted by rapid technology changes.

In the City of London, individual service areas own specialized software exclusive to their service which may not currently be part of the software assets managed by ITS. This local software inventory is not budgeted by ITS unlike the enterprise applications such as J.D. Edwards and Kronos for which ITS incorporates maintenance and renewals in its budget. As the inventory numbers in Table 19 above indicate, the City currently does not have a comprehensive software inventory.

Conclusion – Information Technology

Valued at nearly $46.1 Million, the City's IT assets are overall in **Fair** to **Good** condition, indicating that sufficient investments have been made over the years to keep the IT infrastructure up to date. Budget forecasting expects that inadequate future funding will result in a $10.8 Million infrastructure gap by the end of this decade. Failure to address the infrastructure gap could result in localized reductions to service such as increased maintenance costs, inability to adapt to changing technology, decreased productivity, inconvenience to staff, loss of data and communications, etc. ITS has taken the first steps towards inventory management; the new Information Technology Asset Management program will result in more robust asset information in the future.

City of London Information Technology Infrastructure			
Replacement Value	Current Condition	Infrastructure Gap Current	Infrastructure Gap In 10 Years
$ 46,100,000		**$ 1,342,000**	**$ 10,867,000**



Section 7: Corporate, Operational & Council Services

Land

The Corporation of the City of London directly owns and manages an estimated 5,211 hectares of land. Over 20% of land in urban London is owned by the City. The value of the core lands amounts to over $750 Million. The majority of this land is permanently held in the public trust to provide public services and will never be marketable. The general exception is industrial land which the City prepares for market to encourage economic development.

AT A CENSUS AVERAGE OF 244 ACRES PER FARM IN ONTARIO, THE CITY OF LONDON OWNS LAND EQUIVALENT TO 53 FARMS…

Table 30 – Asset Inventory Summary – Land

Category[27]		Inventory	Unit	Value ($000's)
Park Land	Parks	1,040	HA	$299,982
	Natural Areas	1,496	HA	
Road Allowance		1,571	HA	$271,122
General Government		358	HA	$61,838
Closed Landfill & Natural Methane Areas		339	HA	$58,556
Industrial[28]		268	HA	$40,587
Stormwater[1]		223	HA	$19,805
TOTAL		**5,295**	**HA**	**$751,890**

The responsibility for land lies in the hands of the primary service group using the land. An example of this is Park Services who are responsible for the land used for parks and natural areas. The largest landholder of the City of London is, in fact, Parks services. Land in parks and natural areas, is Park's biggest asset. The City of London has 258 parks that cover 2,536 hectares of land. Natural areas include environmentally significant areas, open spaces, woods and wetlands. Transportation (Roads) is the second biggest landholder through the land used for roads commonly described as the road allowance. The General Government category covers all the

Picture 85 Uplands Natural Methane Area

[27] Includes unassumed lands which become City property upon registration unlike constructed works which remain the responsibility of the developer until assumed.

[28] In accordance with Canadian GAAP Industrial Lands are assets held for sale in an inventory on the Statement of Financial Position and not listed in London's Tangible Capital Assets.

remaining 'facilities' type of assets like City Hall, the fire halls, operations facilities, etc. The exception is recreation facilities which are part of the landholdings of Parks Services.

Closed landfills and natural methane areas are separated into their own category because of their unique nature that limits the range to which they can be developed. London generally uses long closed landfill lands for activities like parks and golf courses. Other activities can be considered but may need to employ engineered measures to deal with any remaining landfill and methane impacts.

The Stormwater category relates to land used for stormwater management facilities which primarily consist of storm ponds. The ponds can be viewed as a natural amenity and often offer recreational opportunities like bird watching areas.

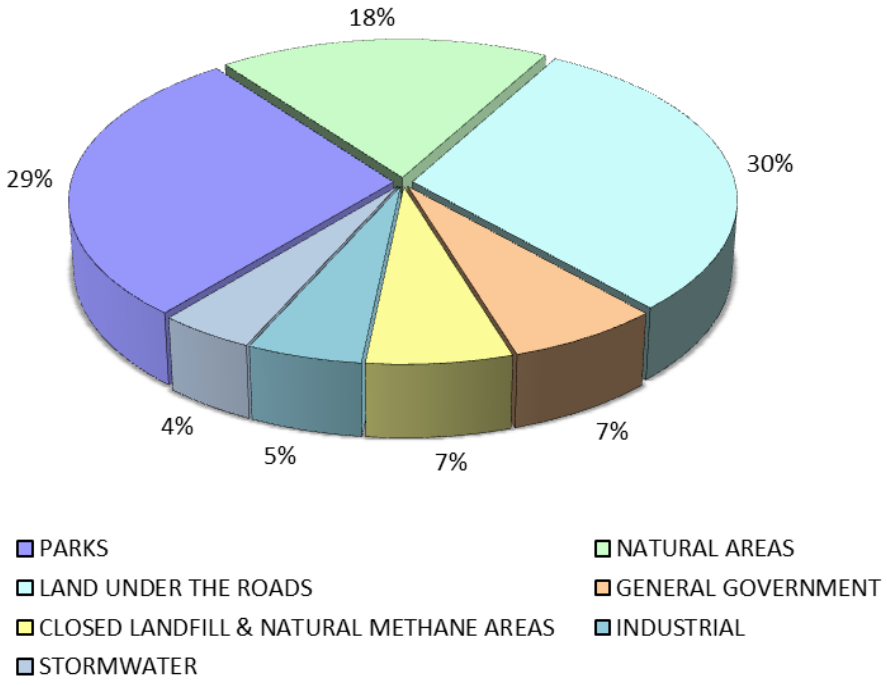
There is no automated central land data registry in the City beyond the information available in GeoDatabase. The City also does not have a database on easements. Detailed ownership information can be obtained, for a fee, by performing a title search at the Land Registry Office, Service Ontario, or on line using Teraview or Geowarehouse. There is opportunity to simplify and consolidate the City owned land records for use in decision making.

Although Land constitutes a major asset to the City, its value and condition cannot be viewed in a similar fashion to other assets like buildings or equipment. Land has an unlimited life and cannot be "consumed". Land has value but no life cycle and is not amortized. Land is not assessed in asset terms of '**Very Good**, **Good**, **Fair**, **Poor** or **Very Poor**'. Currently land is assessed for real market value and understood with respect to zoning its character like hazard or table land. As such, land cannot be considered in the standard context of this report as reflected for our other asset types and their associated infrastructure gaps. We may want to explore the creation of an equivalent rating scale in the future.

There are needs for additional lands to serve the public. Land is needed to address existing deficiencies in services including roads infrastructure, growth, protection of natural assets and the advancement of new and better services. Land needs are appropriately driven by capital service project needs and location, location, location.

Picture 86 Stoney Creek Flood Control facility

Figure 48 - Asset Inventory Summary – Percentage of Land by Hectares



Land owned by the City of London represents an asset group valued at over three quarters of a billion dollars and is an important consideration in many key City decisions. It would be of great benefit to the City if City land information was readily available in a convenient format to facilitate decision-making in the corporation.

Picture 87 Southwest Reservoir Land

State of Infrastructure Conclusions

The City of London owns infrastructure with a replacement value of $10.9 Billion. The condition of the infrastructure is overall in Fair to Good condition meaning that the infrastructure is adequate for now with some elements showing general signs of deterioration that require attention and some elements exhibiting significant deficiencies.

The City of London has a growing infrastructure gap currently estimated at $52.1 Million. This means we are $52.1 Million short of what we need to sustain our $10.9 Billion in assets based on age and condition for the year ending 2012. At current investment rates, the gap will continue to grow over the foreseeable future resulting into a projected infrastructure gap of $466.1 Million by year end 2022. This information is not new but reaffirms our understanding of our City. In the past, Council has made choices that have kept the current infrastructure gap at a low percentage (0.5%) of the total asset base allowing us to continue to deliver quality services to the London community. Projected growth of the infrastructure gap is the concern that must be addressed. Reserve fund levels have increased over the last five years. However, it should be clear that current balances are not sufficient to fund all life cycle projects required in the next ten years.

The findings of this report are based on best available information however they reflect weaknesses in the processes the City of London uses to collect asset data particularly with respect to asset condition and the time and resources required to compile the information. The City is improving its asset management practices to address these areas of weakness through the implementation of the Corporate Asset Management program.

State of Infrastructure Recommendations

This State of Infrastructure Report provides a current view of the City's infrastructure. While the issues facing the City are not insignificant, they are manageable through careful planning and a coordinated and sustained effort from all involved.

The following recommendations are intended to support the City's efforts to implement its Strategic Plan, meet service delivery requirements, manage asset risk and strengthen future financial plans. The findings of this report should be used to:

1. Examine current and future investment priorities and the delivery of services with a view towards mitigating growth of the infrastructure gap; including examination of the current reserve fund levels used for life cycle renewal activities.

2. Develop the companion document, the Corporate Asset Management Plan. The Plan is a new requirement for transfer funding applications made to upper tier governments.

3. Develop the Corporate Asset Management Program including the implementation of its administrative policy, strategies, practices and procedures.

4. Improve areas in need of better asset data management processes.

5. Engage the public and help lobby upper tier governments for infrastructure funding.

This report is the first collective asset review for the City of London. It is a snapshot in time that clearly illustrates the challenges facing London when planning for sustainable service delivery. This document helps us to understand the Corporation of the City of London's current infrastructure portfolio, asset condition and infrastructure funding gap to aid efforts focused on proactively managing the infrastructure gap into the future.

Picture 88 Kensington Bridge

APPENDICES

Appendix 1: Approach

This section describes the methodology used to determine the finding of the report. This first State of Infrastructure Report (SOIR) was developed using the best currently available data already collected by the City. Future reports will be based on a more robust data collection process specifically tailored for asset management reporting, and will also focus on the performance of the assets in terms of their ability to meet demand/capacity and functional requirements.

Whenever available, information on assets, such as inventory, and condition, was obtained from the various departments' database and asset management software. Otherwise, data was collected from the 2012 Tangible Capital Asset (TCA) report, a requirement under the PSAB 3150 legislation. In some cases, expert opinion from staff was obtained to fill gaps in the information particularly with respect to current condition of some assets.

Analysis Methodology

City owned infrastructure information was grouped and analyzed to establish a clear picture of the current state of the infrastructure operated and maintained by each service area. These include Water, Wastewater Services; Transportation Services; Environmental Services; Parks, Recreation & Neighbourhood Services; Protective Services; Social and Health Services; and Corporate, Operational & Council Services. Each Service Area section is broken into four parts: (I) Asset Inventory & Valuation; (II) Asset Condition; (III) Forecasted Infrastructure Gap; and (IV) Conclusions. The information presented is meant to answer the five 'core questions' of Asset Management:

- What do we own?
- What is it worth?
- What condition is it in?
- What do we spend and what should we be spending?
- What is the gap and how do we move towards sustainable service delivery?

1. Asset Inventory & Valuation

This initial SOIR relies on the use of 2012 TCA and GIS information to establish an inventory and valuation of major asset groups controlled by each service area. Where possible, information is verified using independent inventory information stored in GIS, work management systems, and other service area data sources.

2. Asset Condition

The condition of each asset group was evaluated to represent the current 'health' of the City's infrastructure. Future SOIRs will expand this assessment to include other service measures such as adequacy and reliability, to better reflect the ability of assets to service the needs of Londoners.

A five-point rating scale was used to align with that employed by the National Infrastructure Report Card produced by the Canadian Society for Civil Engineering (CSCE), the Canadian Public Works Association

(CPWA), the Canadian Construction Association (CCA) and the Federation of Canadian Municipalities (FCM). In addition to providing a sound basis for assessment, this will allow for high-level benchmarking against the values presented in this document. Ratings range from 1 to 5, as described in the table below, reflecting each asset group's physical condition.

Condition Scale and Definitions

Grade	Summary	Definition
1	Very good: Fit for the future	The infrastructure in the system or network is generally in very good condition, typically new or recently rehabilitated. A few elements show general signs of deterioration that require attention.
2	Good: Adequate for now	The infrastructure in the system or network is in good condition; some elements show general signs of deterioration that require attention. A few elements exhibit significant deficiencies.
3	Fair: Requires attention	The infrastructure in the system or network is in fair condition; it shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies.
4	Poor: At risk	The infrastructure in the system or network is in poor condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration.
5	Very poor: Unfit for sustained service	The infrastructure in the system or network is in unacceptable condition with widespread signs of advanced deterioration. Many components in the system exhibit signs of imminent failure, which is affecting service.

The condition of the assets was determined using one of the three methods below based on data availability and accuracy:

1) Existing condition rating systems (e.g. Pavement Quality Index, Facility Condition Index)

2) Estimated based on age and the remaining estimated useful life of the asset

3) Estimated based on expert opinion, in the absence of 1) or 2) above or where there was low confidence that age and useful life appropriately represented the asset. For example: consider an old pump-house with old piping but a well-maintained relatively new pump representing 80% of the asset value. The data would say the old pump-house was in poor condition while the expert knows the asset is overall in good condition. The opinion of the expert would override age and useful life in this circumstance.

Six main approaches were used to index asset condition to the SOIR rating Scale

- *Existing Rating System: Facility Condition Index (FCI)* – The FCI is a standard facility management benchmark that is used to objectively assess the current and projected condition of a building asset. A facility FCI score is calculated by comparing the costs of renovating the facility into "as new" condition and its replacement value. For example, if it takes $1 Million to renovate a community centre valued $5 Million, its FCI score would be 20%. A brand new facility has an FCI score of 0%. It is generally considered that facilities with an FCI score of less than 5% are in good condition, facilities with an FCI score above 5% and

below 10% are in fair condition, facilities with an FCI score above 10% and below 30% are in poor condition, and facilities with an FCI score above 30% are in very poor condition.

- *Existing Rating System: Pavement Quality Index (PQI)* – The PQI is an industry standard benchmark used to indicate the general condition of a pavement. The method to calculate the PQI is based on a technical inspection of the number and types of distresses in a pavement. Pavement distress includes low ride quality, cracking, bleeding, bumps and sags, depressions, potholes, etc. The result of the analysis is a numerical value between 0 and 100, with 100 representing the best possible condition and 0 representing the worst possible condition. The roads conditions in this report have been categorized as follows: (Very Good) PQI≥80, (Good) 80>PQI≥60, (Fair) 60>PQI≥40, (Poor) 40>PQI≥20, (Very Poor) PQI<20. It is important to note that the City has a target PQI of 65 for City owned Expressways and Freeways; a target PQI of 60 for its arterials and primary collectors; a target PQI of 55 for secondary collectors; and a target PQI of 50 for all other local roads. The City inspects roughly 25% of the roads each year such that all paved roads are inspected within 4 years for PQI.

- *Existing Rating System: Bridge Condition Index (BCI)* – The BCI is a commonly used benchmark that rates the condition of a bridge by evaluating and rating its sub-components, such as foundations, piers, deck structure, sidewalks/curbs/median, abutments or side walls, railings, etc. Each element of the bridge is rated from 1 (the element is on the verge of failure) to 10 (new condition). An overall score for the bridge is then calculated based on the rating of its elements. The bridge condition in this report has been categorized as follows: (Very Good) BCI≥9, (Good) 9> BCI ≥7, (Fair) 7> BCI ≥4, (Poor) 4> BCI ≥2, (Very Poor) BCI <2. All bridges with a span greater than 3 meters are inspected every two years as per the Provincial mandate.

- *Existing Rating System: Sewer Condition Rating* – The City of London uses its internally developed Sewer Sleuth application to grade and manage sanitary and storm sewer condition information collected through the City's Closed Circuit Television (CCTV) inspection program. Sewer infrastructure is video inspected on a ten year cycle, to capture information on defects and deterioration. Using an internal algorithm, the system assigns each sewer a condition rating based of the severity and extent of defects noted through CCTV inspection. Sewers are graded as Good, Fair (1 to 3), and Poor (1 to 3). Based on an assessment of rating definition, the following conversions were made to align with the SOIR rating scale used within this report:

SOIR Grade	Definition	Sewer Sleuth Rating
1	Very good: Fit for the future	Good
2	Good: Adequate for now	Fair 1
3	Fair: Requires attention	Fair, Fair 2, Fair 3
4	Poor: At risk	Poor, Poor 1, Poor 2
5	Very poor: Unfit for sustained service	Poor 3

- *Projected Rating: Age and Expected Useful Life* – When no formal condition assessment was available, the Age of the asset and its Expected Useful Life (EUL) were used to estimate its current condition. The EUL is the average amount of time in years that an asset is estimated to function when installed new and assuming routine maintenance is practiced. The age-based condition was evaluated by comparing the age of the asset to its **remaining** estimated useful life, as shown below:

Rating	Remaining estimated useful life
Very Good	Age ≥80%
Good	80% >Age≥60%
Fair	60%>Age≥40%
Poor	40%>Age≥20%
Very Poor	Age<20%

- *Projected Rating: Expert Opinion* – Where formal condition assessment, reliable age data, or the results of the Age & EUL analysis failed to represent actual condition observed by Staff, expert opinion of the City of London asset managers/custodians was used to estimate asset condition. The expert opinion condition was evaluated by comparing Staff experience to the definition noted in Condition Scale and Definitions table above.

3. Forecasted Infrastructure Gap

Required Investment

Once the condition and estimated useful life was determined, the required investments to maintain the assets were calculated and compared with the City's planned investments to forecast the eventual infrastructure funding gap over the next decade; it being noted that any planned investments beyond 2013 are only forecasts that have not been approved and are subject to budget approval in their respective years via the City of London budget process. This forecast does not include additional funding that will likely be required to accommodate the City's growth (increase in demand for service), inflation or needs for service improvement. In this report, the city uses a variety of methodologies to determine investment requirements using the results of condition assessments, age and estimated useful life, engineering studies, expert opinions and assumptions. These methodologies are discussed below:

- ***Facilities*:** The CMMS System, ReCAPP, used to manage facilities provided projections of FCI at 1, 5, 10 and 20 years. Needed annual investments in terms of maintenance, repair, and deficiencies replacement over the next decade were deducted from those forecasted FCI values for each facility and subsequently added together. These needs were compared to the City's lifecycle renewal capital budget projections over the next decade to calculate the eventual funding gap for maintaining the existing facilities condition at a maximum FCI of 10%.

- ***Roads and Bridges*:** The current and future investments needed to maintain roadways and bridges at the target condition were established in two separate engineering reports delivered

to the City in 2013. These reports are prepared annually. The report on the condition of roads renews data on approximately 25% of the roads in London per year. Required maintenance, rehabilitation, and replacement costs of bridges and structures were estimated based on their condition assessed during the last annual inspection (or bi-annual inspection for bridges and structures with spans over three metres), and spread over the next decade depending on the urgency of the work needed. Current and future investments for roads and sidewalks were estimated through *RoadMatrix* (the pavement management software currently used at the City) or through GIS (the Geographic Information System used by the City to track sidewalks condition) analysis by evaluating the maintenance and rehabilitation needed for sidewalks and each type of road over the next decade. These investment needs were then compared to the City's lifecycle renewal capital budget projections to evaluate the eventual funding gap to maintain roads and bridges. Additional costs to accommodate the expansion of the number of users of the road network, or the extension of the road network to currently un-serviced areas were not included in the calculations.

- ***Other Assets*:** For many assets where the City does not have an established condition assessment process in place, future investment needs were estimated by adding, for each of the next ten years, the replacement value of the assets reaching the end of their expected useful lives. While imperfect, as some assets reaching the end of their EUL might still be in useful condition, or as no major rehabilitation or maintenance costs are accounted for, this methodology to evaluate investment needs still gives a relatively accurate picture of the order of magnitude of the investments the City will have to face to keep its asset base in useful condition. The city also uses specific engineering studies such as water needs study; stormwater facility needs study, etc. These investment needs were subsequently compared with the City's lifecycle renewal capital budget projections over the next decade to evaluate the eventual funding gap. Any additional investments associated with accommodating the expansion of the user base of these assets were not included in the calculation of the funding gap.

- Where **expert opinion** was used to assess the current condition of assets, future investment needs were estimated using current condition, age, EUL and conservative assumptions to determine the replacements/renewals divided evenly over the ten year report period. While imperfect this methodology also gives a relatively accurate picture of the order of magnitude investments required to sustain the current asset base over the next ten years. These investment needs were subsequently compared with the City's lifecycle renewal capital budget projections over the next decade to evaluate the eventual funding gap. Any additional investments associated with accommodating growth or service improvements were not included in the calculation of the funding gap.

Reserves and Reserve Fund Impacts

A **Reserve Fund** is an amount set aside for a specific purpose by authority of a by-law (or as required by legislation) that is carried from year to year unless consumed or formally closed.

A **Reserve** is an amount carried from year to year and established by resolution. They are used mainly as cushions against operating budget contingencies or unforeseen events.

The City of London is similar to other municipalities in Canada struggling with large infrastructure deficits. Having a healthy reserve fund balance ensures the long term financial stability of the City of London through maintaining its credit rating, meeting its day to day working capital needs and financing its capital plan. Inadequate funding of reserves and reserve funds can result in increased borrowing rates, passing costs to future generations, and not addressing funding for future liabilities.

Through the execution of the Strategic Financial Plan established in 2005, the City of London has managed to increase its reserve and reserve fund levels, which has reduced the need for debt to fund its capital program. These balances are crucial in assisting the City with liquidity, funding its capital program, and ensuring intergenerational equity. These savings are used to fund, either partially or wholly, the City's capital renewal programs. As such, the lifecycle renewal reserve funds have been considered in the infrastructure gap analysis. On the whole, reserve fund levels have increased over the last five years. However, it should be clear that current balances are NOT sufficient to fund all capital asset renewal and replacement projects needed in the next ten years.

In recent years the City has allocated most of its resources to major lifecycle maintenance activities used to update assets and extend their useful life. However, given enough time, renewal options are no longer viable and the asset will need to be fully replaced. Full replacements require a greater financial investment. In recent years, the focus has been on major lifecycle maintenance activities. This has led to minimal savings for capital asset replacement.

Planned Budget

The forecasted Planned Budget is the amount of investment the City currently anticipates spending on its infrastructure (noted that these are only projections and subject to change during the annual City of London budget process). This amount is determined in one of three ways depending on the individual service area circumstance:

1. Where the service area's capital budget is funded solely from drawdowns of their specific reserve funds the planned budget presented is the sum total of their reserve fund balance at the end of 2012 plus their total annual reserve fund contributions for the 2013-2022 period.

2. Where the service area does not have a specific reserve fund the planned budget presented is the sum total of the service area's 2013 Life Cycle Capital Budget line items.

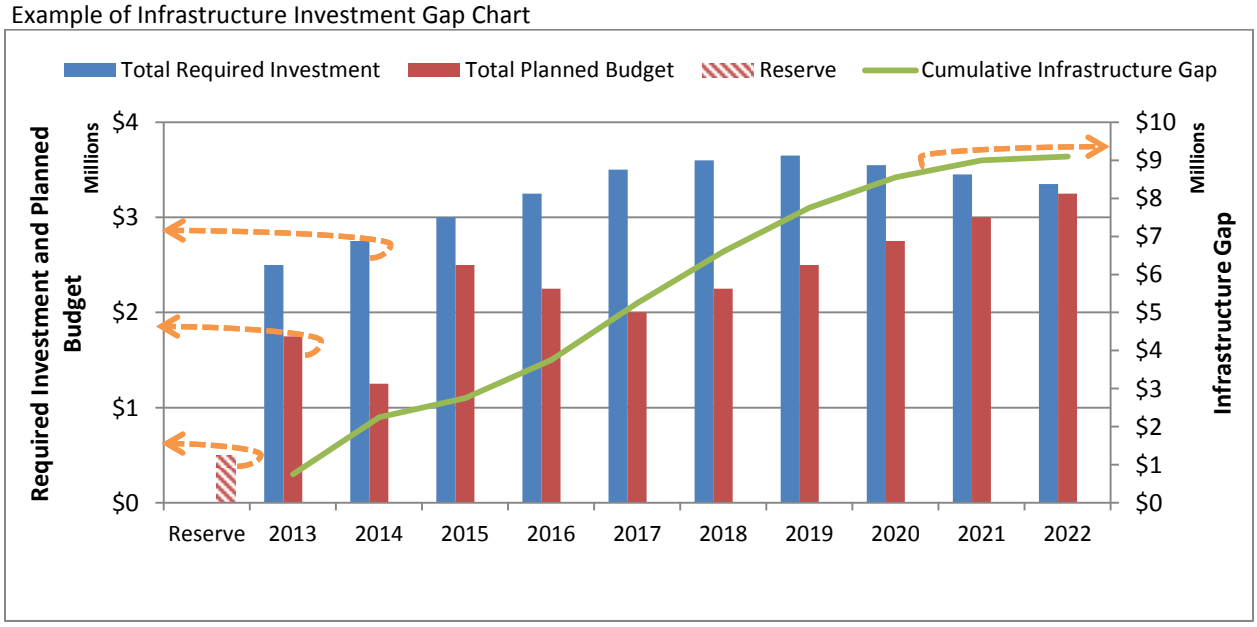
3. Where the service area has both a specific reserve fund and current year money funding their capital budget the planned budget presented is the sum total of their reserve fund balance at the end of 2012 plus their annual reserve fund contributions for the period 2013-2022, plus the

service areas 2013 Life Cycle Capital Budget line items, less their projected drawdowns from reserve funds over the 2013-2022 period[29].

4. Current and Forecasted Infrastructure Gap

Each Service Area chapter includes an Infrastructure Investment Gap chart indicating the investments required to maintain the assets, the City's planned investments and the eventual infrastructure funding gap over the next decade; it being noted that any planned investments beyond 2013 are only forecasts that have not been approved and are subject to budget approval in their respective years via the City of London budget process. The chart highlights whether the past maintenance, rehabilitation, and replacement of these assets have been sufficient (the current gap), and whether projected planned investments are consistent with the anticipated infrastructure needs over the next decade (gap in 10 years).

Example of Infrastructure Investment Gap Chart



The chart displays the following information:

- The *Reserve* red hatched bar represents the "savings" the City has accumulated to help offset investments required for infrastructure.
- The *Total Required Investment* blue bars represent the investments required to maintain our existing assets.
- The *Total Planned Budget* red bars represent the amount of investment the City currently forecasts spending on Life Cycle Renewal of its infrastructure.

[29] The reserve fund drawdowns are deducted in this method to avoid double counting the funds available for investment in the specific service areas infrastructure.

- The *Cumulative Infrastructure Gap* green line is the sum total of the differences between the Total Required Investment and the Total Planned Budget (blue bar minus red bar).

5. Conclusions

Conclusions summarize the findings and their implications for each service area. Along with commentary and recommendations, four main indicators are provided to show where each service area is positioned with regards to the assets under their management:

Replacement Value: the Replacement Value highlights the size of the asset base value each service area has under its management, and its relative importance for the city as a key budget influencer.

Condition Rating: An overall condition rating is attributed to the group of assets the service area manages, indicating its current performance in maintaining the assets in an appropriate condition to deliver its services efficiently and cost-effectively.

Current Infrastructure Gap: The current infrastructure gap indicates the funds that would be required immediately to bring all the assets back into delivering their expected level of service. It highlights whether the past maintenance, rehabilitation, and replacement of these assets have been sufficient and completed in a timely manner.

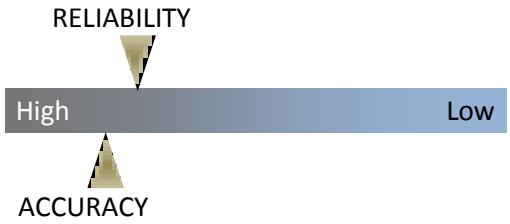
Future Infrastructure Gap: The future infrastructure gap projects, 10 years from now, the infrastructure spending deficit the service area will face to maintain the assets. It contrasts the anticipated investment needs with the City's projected infrastructure lifecycle renewal spending. Future planned investments beyond 2013 are forecasts where the funding has not yet been approved and are subject to budget approval in their respective years via the City of London budget process.

Appendix 2: Data Reliability and Accuracy

Data Reliability and Accuracy Rating

To aid interpretation, a Data Accuracy and Reliability rating is noted in the conclusion section of each service area chapter. The Data rating scales are defined below.

Reliability and Accuracy Scale



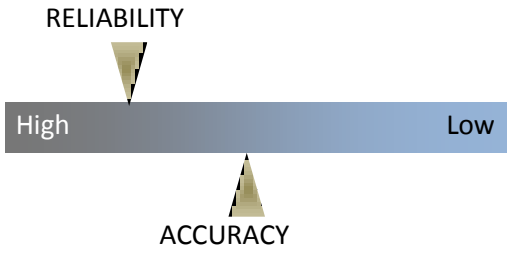
Reliability and Accuracy Scale and Definitions

Measure	Description	High	Moderate	Low
Reliability	Can be trusted to be accurate or to provide a correct result	Based upon sound records, procedures, or analyses that have been acceptably documented, and are recognized as the best method of assessment	Based upon known reasonable procedures, or analyses that have been acceptably documented	Based upon expert verbal opinion or cursory inspections/ observations
Accuracy	Probable difference between a recorded parameter and its true value	+/- 1%	+/- 20%	+/- 50%

Water Data Reliability and Accuracy

Data reliability for the Water service area is rated as moderate to high. Inventory has been verified through GIS. Valuation is based on the City's Water service area's internal network value tracking information. Condition and investment forecasts for linear assets (~55% of replacement value) are based on engineering analysis. Remaining assets have not been formally assessed. Condition and forecasts are based on age and expected useful life estimates combined with expert opinion, which may vary from actuals.

Data Reliability and Accuracy– Water

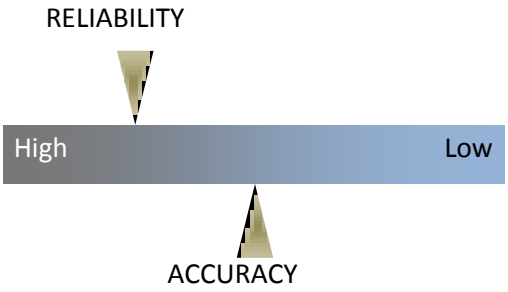


Accuracy is rated moderate, as forecasts for facilities, meters and appurtenances (~45% of replacement value) are based on Water service area values, but condition assessments of these assets are not supported by engineering estimates.

Sanitary Data Reliability and Accuracy

Data reliability is rated as moderate to high. Inventory has been verified through GIS. Valuation is based on TCA information. Condition and investment forecasts for Collection assets (~60% of replacement value) are based on engineering analysis. Treatment assets have not been formally assessed. However condition and forecasts are based on age and expected useful life estimates, which may vary from actuals. Accuracy is rated as moderate, as forecasts for Treatment Assets (~40% of replacement value) are based on TCA values only, and are not supported by engineering estimates.

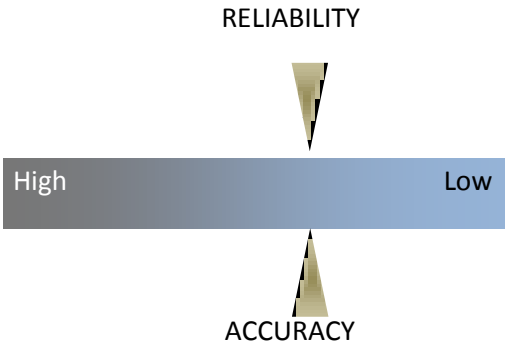
Data Reliability and Accuracy– Sanitary



Stormwater Data Reliability and Accuracy

Data reliability is rated as moderate to low. Inventory has been compiled via various existing sources including GIS and internal Stormwater Service Area data. Valuation is based on TCA information. Condition and investment forecasts for Storm Sewers (~80% of replacement value) are based on regular limited condition assessments. Stormwater Management Facilities Condition is extrapolated from projected facility investments included in a 2010 engineering analysis report. Investment forecasts are based on condition and expected useful life estimates from TCA information. Open Conveyance and Treatment assets have not been formally assessed. However condition and investment forecasts are based on age and expected useful life estimates from TCA information, which may vary from actuals. Accuracy is rated as moderate to low, as only forecasts for Stormwater Management Facilities (~8% of replacement value) are supported by engineering estimates.

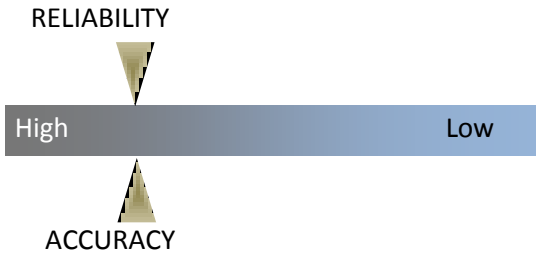
Data Reliability and Accuracy- Stormwater



Roads and Structures Data Reliability and Accuracy

Data reliability is rated as moderate to high. Inventory and Pavement condition have been verified through RoadMatrix (Roadways), GIS (Sidewalks), and engineering reports (Bridges & Structures). Data is not available on road base, curb and gutter or boulevard. Valuation is based on RoadMatrix for Roadways, TCA information for Sidewalks, and engineering reports for Bridges and Structures. Investment forecasts for Roadways (~75% of replacement

Data Reliability and Accuracy- Roads & Structures

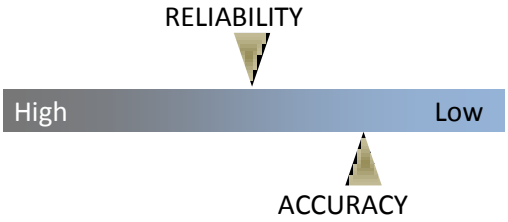


value), and Bridges & Structures (~21% of replacement value) are based on engineering reports. Investment forecasts for Sidewalks (~4% of replacement value) are based on condition and expected useful life estimates. Accuracy is rated as moderate to high, as most forecasts are supported by solid engineering estimate.

Traffic Data Reliability and Accuracy

Data reliability is rated as moderate. Inventory has been derived from Traffic service area tracking information and confirmed using GIS. Valuation is based on service area information. Condition ratings for Signals (~44% of replacement value) based on expert opinion. Condition ratings for lighting (~55% of replacement value) based on TCA age and expected useful life. Condition ratings for Signs (~1% of replacement value) are based on reflectivity testing results. Investment forecasts are based on age and expected useful life estimates. Accuracy is rated as moderate to low, as forecasts are based on theoretical expected useful lives and are not supported by solid engineering estimates.

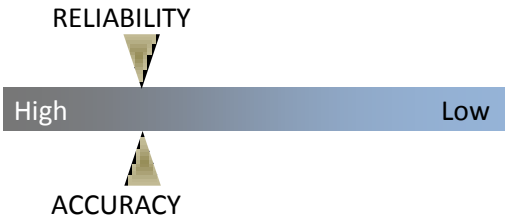
Data Reliability and Accuracy - Traffic



Parking Data Reliability and Accuracy

Data reliability is rated as moderate to high. Inventory has been collected from service inventories and confirmed by City staff. Valuation is based on known replacement costs. Investment forecasts are based on condition and Expected Useful Life of the assets. Accuracy is rated as moderate to high, as most forecasts are supported by unit rates and short-term replacement plans.

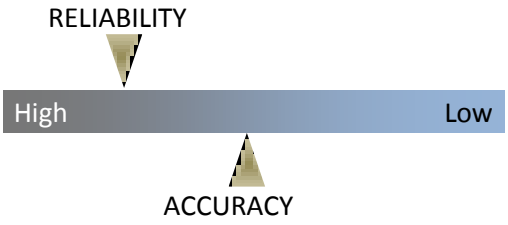
Data Reliability and Accuracy - Parking



Solid Waste Data Reliability and Accuracy

Data reliability is rated as moderate to high - Inventory has been verified through TCA and internal Solid Waste inventory records. Valuation for Diversion and Disposal assets is based on the combination of TCA and internal service area information. Condition and investment forecasts for all assets are based on expert opinion, which may vary from actuals. Accuracy is rated as moderate as forecasts are based on internal capital projections. However condition ratings are not supported by engineering studies.

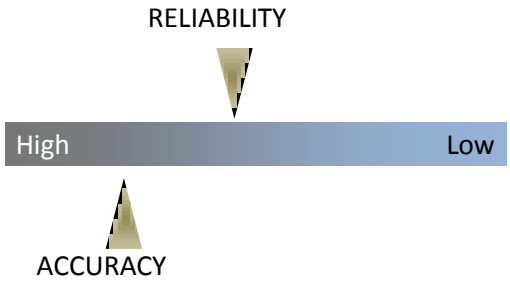
Data Reliability and Accuracy - Solid Waste



Recreation Data Reliability and Accuracy

Data reliability is rated as moderate. Building inventory has been verified through Facilities ReCAPP system. However other equipment information is held in internal Recreation service area records. Valuation for all Parks Facilities assets is based on Facilities ReCAPP system replacement values. Condition and investment forecasts for all Structures (~95% of replacement value) are based on Facility Condition Index scores from ReCAPP, which are determined during regular condition assessments. Remaining assets have not been formally assessed however; condition and forecasts are based on expected useful life estimates, which may vary from actuals. Accuracy is rated as moderate to high; as forecasts for non-facilities type assets are based on TCA values only.

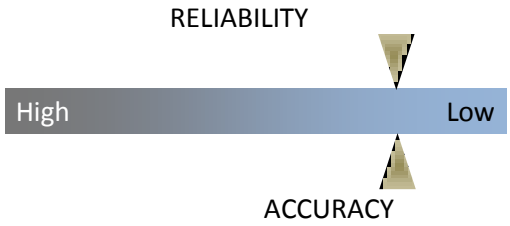
Data Reliability and Accuracy - Recreation



Parks Data Reliability and Accuracy

Data reliability is rated as low. Although inventory has been verified through GIS for land, internal Parks service area records and Facilities ReCAPP information, records are not kept of all parks equipment. Valuation is based on internal expert opinion estimated replacement costs, Facilities ReCAPP data and TCA information. Parks does not perform a periodic and systematic condition recorded assessment of assets. Assets are monitored through routine maintenance like mowing. Condition and investment forecasts are therefore based on expert opinion. Accuracy therefore is rated as moderate to low, as results are not supported by formal estimates.

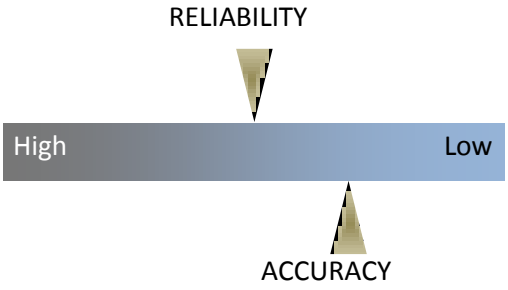
Data Reliability and Accuracy - Parks



Urban Forestry Data Reliability and Accuracy

Data reliability is rated as moderate. Inventory has been evaluated in a 2008 UFORE (**U**rban **Fo**rest **E**ffects) analysis, which estimated the number of trees on a per hectare basis. Valuation is estimated by using a dollar value per tree. An estimate of tree condition was performed in a study in 2002 and was subsequently updated based on average rate of tree degradation based on age or illness. Condition and investment forecasts are therefore based on estimates and expert opinion. Accuracy is therefore rated as moderate to low as forecasts are not supported by recent data, detailed studies and estimates.

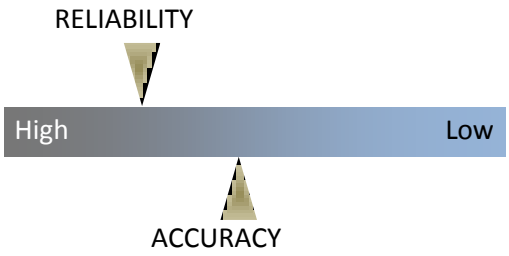
Data Reliability and Accuracy - Forestry



Fire Data Reliability and Accuracy

Data reliability is rated as moderate to high. Vehicles and Equipment inventory has been verified through TCA information. Stations and Facilities inventory has been acquired through Facilities ReCAPP system. Valuation is based on TCA information and Facilities ReCAPP system. Condition and investment forecasts for Stations (~57% of replacement value) are based on regular station condition assessment. Vehicle and Equipment assets have not been formally assessed however; condition and forecasts are based on age and expected useful life estimates, which may vary from actuals. Accuracy is rated as moderate, as forecasts for vehicles and equipment (~43% of replacement value) are based on TCA values only, and are not supported by engineering estimates.

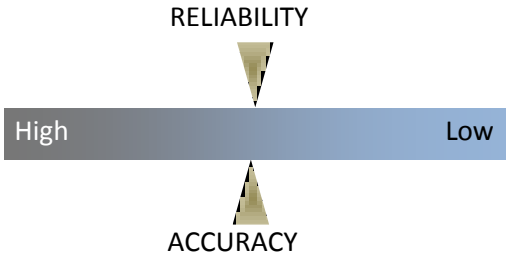
Data Reliability and Accuracy – Fire



Long Term Care Data Reliability and Accuracy

With respect to the facility, data reliability is rated as high while with respect to contents reliability is low. Valuation is based on a combination of Facilities ReCAPP and TCA information. Facility condition and investment forecasts for the facility are based on regular condition assessment. Accuracy is rated as moderate to high, as forecasts are based on regular assessments of the facility. With respect to Dearness equipment, reliability and accuracy are low as inventories are not kept. As a result, this assessment has been averaged at moderate for both to balance the building against the contents.

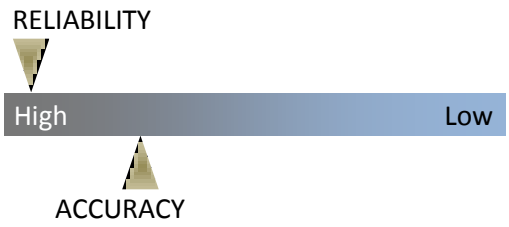
Data Reliability and Accuracy – Long-Term Care



Facilities Data Reliability and Accuracy

Data reliability is rated as high. Valuation is based on Facilities ReCAPP information. Condition and investment forecasts for all Corporate and Culture facilities are based on regular condition assessment. Accuracy is rated as moderate to high, as forecasts are supported by regular condition assessment of the facilities.

Data Reliability and Accuracy – Facilities



Fleet Data Reliability and Accuracy

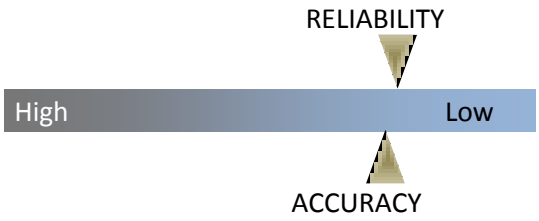
Data reliability is rated as high. Valuation is estimated internally based on market rates. Condition and investment forecasts for are based on age and expected useful life estimates of the vehicles and equipment provided by the Service Area. Accuracy is rated as moderate to high, as forecasts are supported by assessments of the vehicles and equipment age and condition made internally.

Data Reliability and Accuracy – Fleet

ITS Data Reliability and Accuracy

Data reliability and accuracy is rated as low. Inventory is based on information that is evolving as the ITAM project rolls forward. Valuation, condition and investment forecasts for all technology assets are based on expert opinion.

Data Reliability and Accuracy - Technology



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