

London Transit Commission

2015-2018 Asset Management Plan

Appendix B
Asset Management Plan

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Asset Management Plan and 2015-2018 Business Plan

The 2015-2018 Business Plan has as a key underlying theme, “driving change”. The Plan sets out a vision and mission for the organization as well as a number of strategic outcomes that will be used to measure progress over the period.

LTC’s vision - *The valued and trusted mobility choice for Londoners*

LTC’s mission - *Moving Londoners – progressively, reliably and affordably*

The vision and mission statement provided overarching direction for five competing and congruent strategic outcomes, namely:

- *An integrated, affordable and valued mobility choice*
- *An engaged, diverse and respectful workplace*
- *Demonstrated fiscal accountability*
- *Being open, transparent and understood*
- *Effective utilization of infrastructure*

An underlying theme of the Business Plan recognizes that successful planned investment in transit has the potential to be the launching pad for a wide range of initiatives aimed at strengthening the community, increasing economic competitiveness, enhancing mobility and protecting the environment.

One of the five strategic objectives deals specifically with the issue of asset management. The particular strategic objective is the “*effective utilization of infrastructure*”. The strategy calls for acquiring and maintaining required infrastructure supporting the effective and efficient delivery of the service. The strategy requires:

- linking asset planning and service planning;
- maintaining all assets in a state of good repair;
- effectively utilizing proven technology to meet business/service needs e.g. smart bus technology to assist with the delivery of quality customer service;
- completing evidenced based assessment on the acquisition and maintenance of critical infrastructure; and
- continuous review and improvement of systems, processes and procedures supporting effective use of all assets.

The Asset Management Plan takes its direction from the Business Plan, and by extension is linked to the associated Financial Plan.

Asset Management Plan – Introduction

London Transit relies on a range of physical (capital) assets to provide a convenient, reliable, safe and sustainable transit service. Assets require maintenance and servicing to support continued effective and efficient delivery of the service and will eventually have to be replaced. The nature and extent of the assets employed will change as the system grows in terms of ridership, service hours and service design (form).

The Asset Management Plan (AMP) sets out objectives, programs and policies required to ensure the proper stewardship of London Transit's fixed (capital) assets, - assets employed to support the effective and efficient delivery of London's public transit services. Public transit services are defined to include both conventional and specialized transit services.

The primary focus of the AMP is one of supporting "service development and delivery" objectives. Accordingly, the principal objective of the asset management plan becomes one of acquiring and maintaining assets to meet service objectives.

Meeting the strategic objectives underscores the need for the development of a comprehensive AMP which outlines the strategies and initiatives required to ensure the proper stewardship of London Transit's fixed (capital) assets.

The AMP covers two broadly defined and related areas of asset management, namely

- Asset Administration
- Asset Maintenance, Servicing and Investment

Asset Administration

LTC's asset administration policies and programs cover the following major functions:

- fixed asset inventory management
- risk management
- acquisition and disposition of fixed (capital) assets
- parts inventory management

Fixed Asset Inventory Management

Detailed fixed (capital) asset inventory records are maintained by the Finance department and are subject to annual audit and reporting as part of statutory public reporting requirements on an annual basis. As part of the reporting process, detailed listings of the respective assets, as appropriate, are maintained and form part of each year end fiscal audit.

A summary of the make-up of fixed (capital) asset investment, (at original cost) at December 31, 2014 is set out in the following table.

Summary - Fixed Asset Investment - December 31, 2014 (millions)

Description	Original Cost	Percent Investment
Land		
450 Highbury Ave. N - 16.8 acres \$ 0.265		
3508 Wonderland Rd. - 10 acres 2.540	\$ 2.805	1.7%
Buildings and site		
450 Highbury Ave. N \$ 25.111		
3508 Wonderland Rd. 20.626	45.737	27.9%
Rolling stock - 199 buses	96.938	59.2%
Passenger amenities - shelters, pads and terminals	1.040	0.6%
Fare and data collection equipment and systems	4.720	2.9%
AVL communications and radio systems	7.922	4.8%
Bike racks - on buses	0.159	0.1%
Service fleet	0.342	0.2%
Shop equipment and tools	2.932	1.8%
Information technology - hardware and software	1.287	0.8%
	\$ 163.881	100.0%

There are a number of fixed asset items associated with delivery of public transit services excluded from the Commission's inventory records as set out below:

- Specialized transit rolling stock - Specialized transit service vehicles used in the delivery of the service are owned and operated by third parties. The vehicles are provided under the terms of primary and secondary service delivery contracts. The capital cost of the specialized fleet, as well as the related servicing and maintenance costs, are reflected in the contracted hourly rate (primary service contract) or trip rate (secondary service contract) and as such are reported as operating expenditures.
- Passenger amenities - benches - existing benches are or have been supplied by either the City of London (a process that was discontinued in 2014) or under the terms of a bench advertising contract. The benches and platforms where same are placed, are owned, constructed and maintained, under the terms of a contract by a third party (i.e. there is no public investment).

There are 301 (at December 31, 2014) bus stop locations with bench installations.

- Passenger amenities – shelters – There are 406 shelter locations in the system, including those at the conventional transit system’s six major terminal locations (the four regional malls, Fanshawe College and Western University). Of that number, 92 are listed as LTC inventory. The apparent disconnect in inventoried passenger shelters and those actually in the system relates to those passenger shelters supplied and installed under the terms of the passenger shelter advertising contract by the current Contractor. The passenger shelters reverted to LTC ownership at the conclusion of the initial contract. Responsibility for maintenance and servicing the passenger shelters rests with the Advertising Contractor or the owners of the six major terminal locations.

Fixed assets, consistent with public accounting requirements, are recorded at cost which includes amounts that are directly attributable to acquisition, construction, development or betterment of the asset. The cost, less residual value of the fixed assets, excluding land, is amortized on a straight-line basis over their estimated useful life. The amortization periods utilized for valuation are set out in the respective schedule.

Amortization Schedule – Fixed Asset Investment

Description	Useful Life (Years)
Site work	25
Buildings	10-60
Passenger amenities, pads and terminals	10
Rolling stock	12
Fare and data collection equipment and systems	15
Bike racks (on buses)	5
AVL communications and radio system	15
Service fleet	3
Shop equipment and tools	3/5
Information technology hardware and software	3

Risk Management

As set out in London Transit’s Business Plan, a key principle supporting the corporate mission statement and strategic objectives is the acknowledgement that “calculated risk taking is essential if a business is going to succeed”. The principle recognizes that “risk” is inherent in all aspects of a business operation. The challenge is understanding and managing the risk.

In terms of risk management issues associated with this plan, the “asset maintenance, servicing and investment” section of this report discusses the risk and outcomes associated with not having appropriate investment and commitment in the maintenance and upgrading of assets. Accordingly this section will deal with the risk associated with safeguarding (insuring) the investment in assets.

Insurance

Insurance transfers financial risk, in whole or in part, for the loss or damage of a fixed (capital) asset. The nature and extent of insurance coverage purchased is based upon a number of factors, including the level of premiums, the availability of coverage and the extent of self-insurance (risk acceptance based upon deductible levels) provided by the Commission. Summary particulars of London Transit’s respective property (insurance) coverage are set out below:

Rolling Stock

- type of loss insured: named perils, includes fire, lightning, smoke

- insured amount - agreed upon replacement value (currently full replacement cost for buses up to 10 years of age and depreciated replacement cost for buses greater than 10 years of age) noting value listed on a per unit basis primarily based upon age
- includes loss of use coverage – net loss of earnings associated with the fleet, fare collection equipment and radio/AVL on buses and service fleet
- maximum catastrophic loss per occurrence \$50 million – rolling stock
- loss of use (business interruption coverage)
- deductible \$50,000 per occurrence

All Other Property

- blanket coverage based upon current replacement value
- all risk coverage
- loss of use (business interruption coverage)
- deductible \$50,000 per occurrence

In addition to property insurance, London Transit maintains a comprehensive public liability insurance program including automobile, comprehensive general, directors & officers, and environmental protection coverage. The following table sets out the provisional insurance expenditure investment for the period 2015-2018.

Insurance - Operating Expenditure Investment - 2015-2018

Description	2015	2016	2017	2018
Program (millions)				
Property - buildings/equipment	\$ 0.136	\$ 0.153	\$ 0.159	\$ 0.165
Public liability	0.888	0.994	1.034	1.075
Brokers fees	0.077	0.079	0.082	0.085
Deductible costs	0.600	0.600	0.600	0.600
	\$ 1.700	\$ 1.825	\$ 1.874	\$ 1.925

Warranties and Service Agreements

As a base standard, the acquisition of all fixed (capital) assets including but not limited to vehicles, equipment, system technology and bus parts should be accompanied with a manufacturer's/supplier's warranty, noting such warranty generally applies for a one or two year period. This similarly applies to service agreements associated with the fixed (capital) asset being acquired.

Extended warranties and/or service agreements are to be priced and evaluated unique to the acquisition/supply of identified capital assets where specific expertise, capacity and/or proprietary access is needed to support the ongoing utility of the asset, and where such expertise, capacity and priority access is not available at LTC. Such fixed (capital) assets generally have a significant dollar value attached to them and/or are integral to the operation they support, this is particularly critical with respect to the employment of technology.

The purchase of extended warranties and/or service agreements is subject to the evaluation and approval process as set out in the LTC Purchasing Policy.

The availability of warranties is seen as critical to maximizing operating and capital investment in fixed (capital) assets, particularly where product makeup and design are subject to significant changes over time given such factors as technology changes and environmental considerations.

Acquisition and Disposition of Fixed (Capita) Assets

The process for the procurement and disposal of fixed (capital) assets is defined by London Transit's Purchasing Policy. The Purchasing Policy is subject to review and updating from time to time. The policy is predicated on the following principles, noting they are applied in a balanced manner, giving due regard to the requirements of the Purchasing Policy and recognizing the principles are competing in nature:

- procure the necessary quality and quantity of goods and services in an efficient and effective manner which supports London Transit's business (service) objectives, safeguards Commission interest, and mitigates Commission liability
- provide for the most open bidding process practicable in the circumstances for the acquisition and disposal of goods and services
- procure the required goods and services with due regard to the preservation of the natural environment, i.e. due consideration to the purchase of goods that are considered (pre and post use) environmentally friendly
- select successful bids subsequent to critical assessment of the respective compliant bids based upon predetermined criteria for the goods and services being acquired. Price is one such criterion, but is not the sole determinant.
- where appropriate, given the extent of the investment required, support the need for and the purchase of goods and services based upon a business case assessment
- support and develop private/public business opportunities where there is shared benefit and risk to each of the parties and where there is net economic advantage versus alternatives
- support and develop cooperative purchasing ventures with other public institutions where such ventures support all or some of the following in a balanced fashion:
 - the timely delivery of goods and services
 - the receipt of a quality product and/or service (both pre and post-delivery)
 - mitigation of administrative resource requirements
 - provides favourable competitive pricing
 - results in a positive impact on inventory level requirement

The Purchasing Policy sets out the necessary process to be followed, including approval requirements relating to the acquisition and disposal of fixed (capital) assets. A number of the more critical policy requirements impacting the acquisition of fixed (capital) assets decisions include:

- Business Case Development - Decisions respecting a significant undertaking and/or investment are to be supported by a Business Case. The Business Case guideline/framework to be utilized is the business case template as defined in the Purchasing Policy. It is recognized that the Business Case guideline unique to a specific initiative may be defined/directed by the supporting investment organization to whose approval is sought. Further the guideline may be scaled reflecting the investment requirement.
- Lease Versus Buy Decisions - Lease versus buy decisions are really an assessment of the most economic means to acquire a required asset, noting the acquisition of the asset may, by its nature be subject to a Business Case assessment. Set out in the Purchasing Policy is a summary discussion on the issue of leasing (leases). Decisions on lease versus buy are subject to detailed costing, which should be undertaken utilizing the appropriate external professional expertise.

Purchasing management will determine, in consultation with the respective department management and consistent with provisions of the Purchasing Policy, what appropriate bid document is to be used to facilitate the purchase of goods and services, i.e. Request For Tender, Request For Quotations or Request For Proposal. The use and processing of the respective bid document are detailed in the Purchasing Policy.

Disposal, Removal, Transfer of Fixed (Capital) Assets

All departments notify Purchasing when items become obsolete or are deemed surplus to their requirements. The Purchasing department will assess whether the items can be of use to another department rather than disposed of.

Items that are not claimed for use by another department will be offered for sealed bids, public auction or other public sale. The Director of Finance will be responsible for determining the most suitable method of disposal. Depending upon the assets being disposed of, Commission approval of the disposal may be required.

The revenue from the sale of obsolete or surplus equipment is applied to general operating revenue as proceeds from the sale of assets and subsequently transferred as contribution to the capital program reserve fund. The procedures to be followed for the disposal of buses, service vehicles, Inspector vans, shop equipment and obsolete inventory are detailed in the Purchasing Policy.

Parts Inventory Management

A well-managed parts inventory program is an essential element of a successful vehicle maintenance system. The parts inventory system currently tracks activity for 4,366 parts. The current investment in parts inventory is approximately \$1.6 million (at December 31, 2014).

Summary Inventory Analysis at December 31, 2014

Description	Amount
Total inventory investment (millions)	\$ 1.766
Less/minus fuel, engine oil etc. (millions)	0.216
Total investment in parts inventory (millions)	\$ 1.550
Total direct bus maintenance parts expense (millions)	\$ 3.265
Percent parts inventory of direct bus maintenance parts	47.5%
Total number of parts in inventory	4,366
Fleet size at December 31, 2014	199
Parts inventory cost per bus (millions)	\$ 0.008
Direct bus maintenance parts cost per bus (millions)	\$ 0.016
Average fleet age	6.9

The effectiveness of the parts inventory management system is measured in terms of finding the optimum balance between having parts available to affect the timely repair of the fleet, supporting availability of fleet for service and the level of investment in inventory and related carrying cost of same.

The appropriate balance between parts availability investment level focuses on:

- ensuring there are no “critical stock out” occurrences – i.e. parts availability preventing meeting service;
- ongoing adjustment to minimum/maximum inventory levels, for respective parts, linking the requirements to planned/scheduled vehicle maintenance;
- working with parts suppliers to ensure consistency in the quality of supplied parts, timely delivery and competitive pricing and continued progressive administration of a system of warranty recovery covering both OEM warranties and vendor part warranties;
- continued assessment and standardization, as appropriate of fleet , fleet components and/or parts and services; and
- ongoing monitoring and assessing (and changing, as appropriate) inventory control processes and procedures.

Asset Maintenance, Servicing and Investment

Overview

Over successive business planning periods and consistent with the current Business Plan’s strategic objective/outcome of “*effective utilization of infrastructure*”, critical capital and operating investment in state of good repair has supported the elimination of the infrastructure deficit, and resulted in an overall positive rating of LTC assets being “very good – fit for the future”. The summary assessment by asset category is set out below. The assessment completed as at December 31, 2013 is equally applicable as at December 31, 2014.

Summary Assessment of Fixed Assets at December 31, 2013

Description	Assessment
Buildings and site	
450 Highbury Ave. N	Very good - fit for the future
3508 Wonderland Rd.	Very good - fit for the future
Rolling stock - 199 buses	Very good - fit for the future
Passenger amenities - shelters, pads and terminals	Good -adequate for now
Fare and data collection equipment and systems	Good -adequate for now
Fare and data collection systems -smart card	Very good - fit for the future
AVL communications and radio systems	Very good - fit for the future
Bike racks - on buses	Very good - fit for the future
Service fleet	Very good - fit for the future
Shop equipment and tools	Very good - fit for the future
Information technology - hardware and software	Very good - fit for the future

As noted “shelters, stops and pads” and the “fare and data collection system” are the only two Commission assets not assessed as being “*very good – fit for the future*”. The two assets are assessed as “*good – adequate for now*”.

The assessment rating for the Commission’s infrastructure is based upon the following key considerations:

- the assessment is in relation to the asset condition supporting meeting and maintaining current service levels;
- the nature and extent of state of good repair infrastructure investment over the past 10 years;
- the nature and extent of operating programs and investment supporting state of good repair e.g. move to pro-active preventative maintenance programs for buses including ancillary systems; and
- the nature and extent of planned infrastructure investment over the next 10 year period focusing on state of good repair investment.

Discussion on maintenance, servicing and investment of the major fixed (capital) asset investment categories follows.

Facility

London Transit operates two facilities in support of its operation. In addition, a downtown information office is leased.

450 Highbury Avenue N. – Main Facility

The 261,500 square foot facility is located on 16.8 acres of land on the south-east corner of Highbury and Brydges. The largest area of the facility (approximately 200,000 square feet) was constructed in 1949 as an auto parts manufacturing operation. The city purchased the site in 1968 (note: title to the land was held by the City until 2010 at which time it was transferred to the LTC for a nominal amount). Between 1968 and 1972 the facility was converted to accommodate a public transit operation. The conversion was a best fit to accommodate a transit operation versus a manufacturing concern.

The body shop (approximately 4,500 square feet) was constructed in 2002/03 and the two service lanes and storage area (approximately 50,000 square feet) were constructed in 1992/93. In addition, there was a Compressed Natural Gas (CNG) compressor/fuelling station that was constructed in 1993/94. The station had the capacity to fast fill 100 CNG buses per shift and was closed in 2008 paralleling the retirement of all CNG buses from LTC's fleet.

The facility as it currently stands can accommodate the equivalent of 185 40' buses and supports the following major activities:

- General Administration – finance, human resources, planning, purchasing, specialized transit operations, customer service
- Operations – dispatch, operator room, supervisor and inspection areas
- Bus maintenance - repair bays, component overhaul, parts stockroom, body and paint shop
- Vehicle servicing – fuelling, cleaning and washing buses and external area for fuel and oil storage
- Roadways and parking – driveways and lanes for accessing the property, internal circulation and employee and visitor automobile parking

In 2006, the Commission approved retaining and maintaining the 450 Highbury Ave. N. facility for a period of up to 20 years, restricting operations to what was currently provided and recognizing the existing facility required approximately \$11.9 million (2006 dollars) in upgrades, which were scheduled to be undertaken in a priority manner over a five year period.

The upgrades related to the facilities included mechanical, electrical, heating, air and water systems, lighting, upgraded washrooms, air make up units, roofing, asbestos abatement, and flooring. The actual investment was in excess of \$14 million, noting the last piece of major work (air makeup unit in C Barn) was completed in 2014. The vast majority of the work was completed during the period 2009-2011, supported by \$6.9 million in federal/provincial/municipal economic stimulus funding.

The Commission also approved in principle the rebuilding, in a phased manner, of the Highbury facility, beginning in 2022 on the present site at an estimated cost including demolition of \$45.6 million (2006 dollars).

3508 Wonderland Road – Satellite Facility

In 2006, the Commission approved the construction of a second facility, operating as a satellite facility to accommodate fleet expansion of 110 buses, noting the estimated capital cost including land purchase was set at \$25.2 million (2006 dollars).

In 2009, London Transit purchased from the City of London (\$2.5 million) approximately 10 acres of excess City of London land located in the south/west sector of the City on 3508 Wonderland Rd. On the site London Transit constructed a 140,000 square foot 100 – 40' equivalent bus maintenance, servicing and storage facility and limited future general and administrative office capacity. The facility can be expanded to house a further 10- 40' buses in the future. The total cost of the facility (land acquisition, demolition and construction) was \$23.8 million with approximately 96% of the funding provided by federal and provincial investment. Unlike the 450 Highbury Ave. N. facility, the satellite facility was built as a

transit purpose facility.

The two facilities bring the current maintenance/servicing/storage capacity to the equivalent of 285 – 40' buses. The current fleet at December 31, 2014 expressed in terms of 40' equivalent is 205 buses, representing 72% of total facility capacity. Actual fleet at December 31, 2014 totalled 199 buses comprised of 14 - 60' buses, 4 – 30' buses and 181 – 40' buses.

Information Office

London Transit rents space in the downtown area to serve as an information/ticket office and operator waiting area. The facility is not listed as a Commission asset. The use of the facility and responsibility for maintaining the facility are set out in the lease agreement. The current lease is set to expire at the end of August 2015. A business case assessment respecting the continued requirement for the information office at the current location giving consideration to such factors as need for operator waiting area, the potential re-routing of transit service in the downtown (Dundas and Richmond Streets) and the introduction of a smart card system which provides the option of online renewal of the smart card mitigating the number of physical sales locations will be completed once further details regarding the influencing factors are known.

Operating Expenditure Investment – Facility

Facility operating expenditure investment on an annual basis accounts for on average 5.2% of overall operating expenditure investment. The investment ranges between \$3.3 million and \$3.6 million per year. The make-up of the facility operating expenditure investment is set out in the following table.

Summary of Facility Operating Expenditure Investment 2015-2018

Description	Provisional Estimates			
	2015	2016	2017	2018
Facility costs (millions)				
Personnel costs (a)	\$ 0.595	\$ 0.623	\$ 0.641	\$ 0.660
Material costs -supply and service cost	2.667	2.756	2.848	2.944
	\$ 3.262	\$ 3.379	\$ 3.489	\$ 3.603
Percent of total operating investment	5.3%	5.2%	5.2%	5.1%
Percent make up of total facility cost				
Personnel costs	18.2%	18.4%	18.4%	18.3%
Information office	1.2%	1.2%	1.2%	1.1%
Maintenance of stops	7.3%	7.1%	7.0%	6.8%
Utilities (electricity, natural gas, water)	35.5%	36.0%	36.6%	37.2%
Municipal taxes	21.4%	21.3%	21.2%	21.2%
Contracted services (b)	10.2%	10.0%	9.8%	9.5%
Maintenance supplies and services (c)	10.7%	10.5%	10.2%	10.0%
Expenditure offset (sale of hydro solar panels)	(4.6)%	(4.4)%	(4.3)%	(4.2)%
	100.0%	100.0%	100.0%	100.0%

Notes

(a) personnel cost - equivalent of 7 full time positions, including 4 plant engineers

(b) contracted services includes janitorial, security, garbage collection, summer/winter maintenance

(c) minor repair and upkeep to facility, grounds, equipment including building systems

The Information Office and maintenance of the system stops are included as part of the facility operating expenditure investment. The summer/winter maintenance of 2,009 stops applies to keeping the stops and shelters in a safe condition, noting the passenger shelters and benches are maintained by the contractor to a standard set under the terms of a related contract.

The most significant portion of the costs relate to utilities (averaging 37% of facility costs) at London

Transit’s two owned fleet maintenance/storage and office facilities. While much has been done in terms of energy (utility) conservation including occupancy sensitive use of heat, light and water; installation of in-ground rain water storage tanks at the Wonderland facility to provide the opportunity to use the rain water to wash buses, and the upgrading of the 50 year old HVAC and air make up systems at 450 Highbury Avenue facility, the nature of the transit operation and the size and use of the facilities have a significant impact on utility consumption.

Capital Expenditure Investment – Facility

The following table sets out the provisional capital expenditure investment for the current business planning period 2015-2018 as well as the estimates for 2019-2024. The investment is largely funded by the City of London as a life-cycle maintenance program.

Over the next four years, the concentration of facility related capital expenditure will be associated with the state of good repair of the Highbury Ave and Wonderland Road facilities. The investment applies to building systems, equipment and structure, with the work being completed on an as-required basis, supporting the safe, effective and efficient use of the facilities in the delivery of London’s public transit services.

Facility - Provisional Capital Expenditure Investment (millions)

Description	2015 to 2018	2019 to 2024	Total
Facility upgrades and state of good repair	\$1.200	\$ 2.500	\$ 3.700
450 facility - phased demolition and rebuild	-	9.000	9.000
Facility - expansion - bus rapid transit	-	12.500	12.500
	\$1.200	\$24.000	\$25.200

Commencing in 2022, work is scheduled to begin on the phased demolition and rebuilding of the 450 Highbury facility and the expansion of bus storage and maintenance capacity associated with the implementation of London Transit’s rapid transit strategy as defined in the 2030 Transportation Master Plan. The phased demolition and rebuilding of a transit specific facility at 450 Highbury Ave. location presents significant logistical issues/challenges that have to be addressed so as to not compromise service delivery or the maintenance of assets in a state of good repair.

Rolling Stock (Fleet)

At December 31, 2014, the Commission fleet totals 199 buses having a total capital cost of \$96.938 million representing 59% of the Commission’s total asset investment. The age and make-up of the fleet at December 31, 2014 is summarized in the following table.

Fleet Make-up and Age at December 31, 2014

Purchase Date	Retire Target	40' Diesel	40' Hybrid	60' Diesel	30' Diesel	Total	Avg. Age
2003	2015	23		3		26	12
2004	2016	14				14	11
2005	2017	19				19	10
2006	2018	18				18	9
2007	2019	13				13	8
2008	2020	14		3		17	7
2009	2021	15			4	19	6
2010	2022	10	4			14	5
2011	2023	11	2	4		17	4
2012	2024	9	2			11	3
2013	2025	12		2		14	2
2014	2026	15		2		17	1
Total		173	8	14	4	199	6.9
Percent make up		87.0%	4.0%	7.0%	2.0%	100.0%	

The fleet of 199 buses is considered low-floor accessible, consistent with the requirements of the Accessibility for Ontarians with Disabilities Act.

Over the period of 2015-2018, \$45.077 million in total capital (fixed asset) expenditure investment for fleet will be required, which accounts for 86% of the total capital expenditure investment over the period. The \$38,639 million is to be invested in the purchase of 55 new replacement buses and 17 new expansion buses.

Fleet Purchases - 2015-2018 (millions)

Description	Number of Buses	Investment Amount	Percent Make-up
Replacement buses	55	\$ 29.360	65.1%
Expansion buses	17	9.279	20.6%
	72	\$ 38.639	85.7%
Total capital expenditure investment		\$ 45.077	100.0%

At December 31, 2018, the projected fleet will total 216 buses having an average age of 6.9 years. In terms of vehicle size, the 216 buses are equivalent to 222 – 40' buses representing 78% of the total facility capacity. The projected profile of the fleet is set out in the following table.

Fleet Make-up and Age at December 31, 2018

Purchase Date	Retire Date	40' Diesel	40' Hybrid	60' Diesel	30' Diesel	Total	Avg. Age
2005	2017	4				4	14
2006	2018	18				18	13
2007	2019	13				13	12
2008	2020	14		3		17	11
2009	2021	15			4	19	10
2010	2022	10	4			14	9
2011	2023	11	2	4		17	8
2012	2024	9	2			11	7
2013	2025	12		2		14	6
2014	2026	15		2		17	5
2015	2027	17		1		18	4
2016	2028	16		1		17	3
2017	2029	17		1		18	2
2018	2030	19		0		19	1
Total		190	8	14	4	216	6.9
Percent make up		88.0%	3.7%	6.5%	1.8%	100.0%	

The goals for fleet operations over the medium term are as follows:

- retiring buses at 12 years of age (considered economic useful life of a bus) in a balanced manner given the timing of purchases with the objective of moving over time to an average fleet age of 6 years;
- establishing direct bus maintenance and servicing costs, exclusive of fuel at 20% of total operating cost per revenue service hour (based on operating from two facilities), with an objective of reducing same to 18% over the medium term;
- ensure compliance with all regulatory requirements pertaining to MTO Safety Inspections, Ontario Highway Traffic Act, Commercial Vehicle Operators Registration, Occupational Health and Safety Act, Ontario's Drive Clean Program and the Accessibility for Ontarians with Disabilities Act;
- establishing and maintaining quality preventative and predictive maintenance programs versus relying on reactionary unscheduled maintenance;
- establishing and maintaining a spare fleet not exceeding 25% of peak fleet requirements, migrating to a 24% spare fleet make up by the end of the business planning period;
- meeting scheduled service requirements 100% of the time;
- continuous improvement in reducing the number of service interruptions relating to fleet issues, through analysis, trending of same and taking corrective and/or preventative measures;
- standardizing fleet and/or fleet components to the extent same is economically viable and logistically feasible;
- acquiring extended warranties (risk transfer) relating to major component parts, technology etc., which is particularly critical given evolving technology;
- maintain a rebuild program for engines and transmissions that utilize fully insured/warrantied reconditioned engines/transmission (vs. rebuilding same in-house); and
- continuing investment in upgrading and maintenance of shop equipment, tooling, and technology

Operating Expenditure Investment - Vehicle Maintenance and Servicing

LTC operates a “full service” maintenance and service facility. The various maintenance and service programs recognize the fleet is in service up to 18 hours a day, 7 days a week, and 52 weeks of the year. This requires the maintenance and servicing function to operate 24 hours a day, 7 days a week, 52 weeks a year. Fleet maintenance and servicing is completed at two facilities with the Highbury facility operating 365 days a year and the Wonderland facility operating on weekdays only.

The following charts provide a high level summary of the operating investment in vehicle maintenance and servicing excluding fuel costs and fleet performance indicators for the period 2015-2018.

Vehicle Maintenance and Servicing Operating Expenditure Investment - 2015-2018

Description	Provisional Estimates			
	2015	2016	2017	2018
Expenditure investment, excluding fuel (*) (millions)	\$ 12.675	\$ 13.126	\$ 13.620	\$ 14.029
Fleet size at December 31	205	208	212	216
Average cost per revenue service hour	\$ 21.60	\$ 21.65	\$ 21.89	\$ 22.24
Avg. vehicle maintenance and service cost/vehicle (millions)	\$ 0.062	\$ 0.063	\$ 0.064	\$ 0.065
Percent of total operating investment	20.5%	20.3%	20.2%	20.0%
Number of buses per skilled trade - fleet maintenance	3.8	3.9	3.9	3.9
Number of buses per general labour - fleet maintenance	6.6	6.5	6.6	6.8

(*) allocated on average 66% personnel cost and 34% materials, supplies and services, excluding fuel

Fleet Performance Indicators - 2015-2018

Description	Provisional Estimates			
	2015	2016	2017	2018
Fleet size at December 31	205	208	212	216
Peak requirements	164	167	171	174
Spare fleet	41	41	41	42
Percent spare fleet of peak requirements	25.0%	24.6%	24.0%	24.1%
Average age	6.9	7.0	7.0	6.9
Mean km - in service repairs	4,971	5,170	5,379	5,592
Mean km - service pull ins	5,136	5,342	5,555	5,778
Times late out of garage (delay in service)	164	155	147	139
Buses not available for service	-	-	-	-

The operating expenditure investment and fleet performance indicators are consistent with the goals of vehicle maintenance and servicing.

Over the period 2013/2014, a performance review of the vehicle maintenance program was completed. The undertaking of the review was consistent with the ongoing business objective of “continuous improvement”. The review recommendations focus on the re-investment in preventative, predictive maintenance, clarifying reasonable expectancies (for work completion), and improvements to work planning with specific recommendations calling for:

- continued enhancement of the use of the fleet management information system technology to assist with all aspects of planning and scheduling of maintenance work, tracking bus performance and decisions regarding retaining, repairing, and retiring of fleet;
- continuous review, updating, implementation and follow-up on standing operating procedures/protocols, and reasonable expectancies;
- focusing resources, as appropriate, in terms of what is done, when it is done and by whom, supporting shifting to preventative maintenance programs i.e. ensuring shifts are defined to

provide the appropriate mixture of skills assigned to complete the required work at the appropriate time; and

- continuing investment in training, including job specific training, relating to changing fleet technology and safe workplace practices and procedures.

Progress on continuous improvement will be critical on a going forward basis given the significant investment in fleet both in terms of replacement and expansion vehicles over the period 2019-2024 which will be impacted by the changing bus technology as well as the technology of the ancillary equipment installed on the bus. As indicated, in addition to replacing 99 existing buses in the fleet, the fleet will expand by 47 over the period bringing the total fleet to 273 vehicles.

Fleet Purchases - 2019-2024 (millions)

Description	Number of Buses	Investment Amount	Percent Make-up
Replacement buses	99	\$ 53.001	46.8%
Expansion buses	7	3.851	3.4%
Expansion buses - BRT	40	27.518	24.3%
	139	\$ 84.370	74.5%
Total capital expenditure investment		\$ 113.241	100.0%

The fleet of 263 vehicles is expected to be comprised of 229 – 40’ buses and 34 – 60’ buses for an equivalent 280 - 40’ buses or 5 less than current facility capacity underscoring the need for completion of planned facility expansion as noted earlier by 2025 at the latest.

Technology

As noted in the following table at December 31, 2014 the Commission has invested \$13.929 million in technology.

Summary Investment in Technology - December 31, 2014 (millions)

Description	Original Cost
Fare and data collection equipment and systems	\$ 4.720
AVL communications and radio systems	7.922
Information technology - hardware and software	1.287
	\$ 13.929

The major components of the investment include:

- smart bus technology (AVL/radio communications) – conventional transit \$7.218 million
- safety/security cameras on buses - \$0.851 million
- on bus fare collection system \$2.152 million
- \$2.172 million in smart card technology with a further \$1.6 million to be invested in 2015

Given the increased and growing reliance on technology, the rate of change of such technology and how technology is managed and supported, a comprehensive review of technology (nature, extent and management) with a view of developing an overall Technology Plan has been undertaken. The Technology Plan is anticipated to be completed mid-2015, noting the plan is expected to have an impact in defining new capital investment (replacement, upgrade and expansion).

For the period 2015-2018, \$3.4 million has been identified for both new and upgraded technology system

software and hardware requirements including:

- the ongoing replacement/upgrade of system hardware infrastructure i.e. work stations, servers
- the replacement (and upgrade) of the call taking, scheduling and dispatch system associated with the specialized transit system;
- updating of various management information database systems;
- fleet radio replacement; and
- replacement of current fare collection (on board bus) equipment, the nature of which will be influenced by the introduction and use of smart card technology.

The investment of \$3.4 million is reflective of one of the key themes of the 2015-2018 Business Plan which is the progressive use of existing and new technologies supporting effective and efficient management and delivery of services. In addition, linked to the purchase of each new expansion bus, is the purchase (and installation) of the technology hardware associated with the ancillary systems (e.g., AVL, smart card, security cameras). The investment for such technology averages \$37,000 per bus.

The capital investment in technology is supported by direct annual operating expenditure investment of approximately \$0.700 million per year. An average of \$0.512 million is invested in fees, support service agreements and contracted technical support with the balance covering the salaries and benefits of two full time staff engaged in the management of London's technology strategy. The \$0.700 million in operating expenditure investment represents approximately 1% of total expenditure.

Passenger Amenities

At December 31, 2014 London Transit's Capital Investment in passenger amenities totalled \$1.040 million, the make-up of which is set out in the following table.

Passenger Amenities Investment - Dec. 31, 2014 (millions)

Description	Amount
Shelters and pads - 97 shelters only	\$ 0.382
Signs	0.225
Terminals -	0.104
Accessibility pads	0.329
	\$ 1.040

The \$1.040 million capital investment in passenger amenities covers shelters, accessibility pads and bus stops signs. There are 406 passenger shelter locations in the system, including those at the system's six major terminal locations (four regional malls, Fanshawe College and Western University). Of that number 92 are listed as LTC inventory. The apparent disconnect relates largely to those passenger shelters supplied and installed under the terms of the passenger shelter advertising contract by the Contractor. The passenger shelters reverted to LTC ownership at the conclusion of the initial contract. By contract, responsibility for maintenance and servicing the passenger shelters is the responsibility of Advertising Contractor or owners of the six major terminal locations.

Currently there are 2,180 stop locations in the system. The following table sets out a profile of the amenities at the stop locations.

Summary of Passenger Amenities

Amenity	Total	% of Stops
Passenger shelters	406	19%
Benches	301	14%
Accessibility pads	2,009	92%

The 2015-2018 capital budget program calls for a \$1.3 million investment in stop upgrades. The largest portion of the investment pertains to the phased replacement of existing passenger shelters, commencing in 2016. The balance of the stop upgrade program deals with the expansion of the passenger shelter program and installation of landing pads. The installation of passenger shelters is undertaken on a priority basis with selection being based upon a warrant system that considers the number of boarding's, service frequency, exposure to the weather and site conditions at the stop location.

Other Fixed (Capital) Asset Investment

The two other major categories of fixed (capital) asset investment are shop equipment and tools (\$2.932 million) and service and inspectors fleet (\$0.342 million). These assets are subject to the same policies, procedures and protocols respecting their acquisition, maintenance and servicing. As with the other categories of assets, the identified assets support the effective and efficient delivery of the service.

The capital investment strategy over the 10 year period 2015-2024 provides for annual investment of \$200,000 in shop equipment and tools, and \$40,000 for service fleet. The investment covers the replacement and expansion of the respective assets as appropriate.

Going Forward

The AMP is a key management document that is updated consistent with the updating of the Business Plan, reflecting changes in strategy, business direction and asset inventory for planning and operational purposes. The AMP is a key management document that reflects changes in strategy, business direction and asset inventory for planning and operational purposes. As a best practice the AMP forces an organization to take stock of what it has identified as gaps in condition or capacity and sets out estimates of the financial requirements for acquisition, state of repair, disposition and expansion/upgrading of fixed (capital) asset requirements.

In terms of the latter, the planned introduction of London's rapid transit strategy post-2018 will have a significant impact on the extent of fixed (capital) asset investment requirements and maintenance and servicing of same. Summary particulars of the \$389 million capital investment from the 2030 Transportation Master Plan are set out in the following table. The capital cost estimates will be clarified with the completion of a related Environmental Assessment which is currently in progress.

Summary of Capital Investment - BRT Strategy (millions)

Description	Units	Amount
Environmental assessment		\$ 3.400
Land		\$ 107.500
Engineering, utilities and construction		\$ 190.754
Downtown terminal		\$ 5.000
Facility (maintenance and storage)		\$ 25.000
60' transit vehicle	37	\$ 31.087
40' transit vehicle	48	\$ 26.410
		\$ 389.151
Funding		
City of London		\$ 129.717
Province of Ontario		\$ 129.717
Government of Canada		\$ 129.717
		\$ 389.151

Going forward, LTC faces a number of critical asset management challenges in addition to the aforementioned \$389 million relating to the rapid transit strategy. The challenges range from planning, development and implementation including ongoing maintenance of assets that reflect and support a growing public transit service. Over the next four year planning horizon, the dynamics of asset management will be impacted by:

- the continued development and implementation of the smart card technology, noting same will have a direct impact on the planned replacement of the on-board fare processing equipment;
- the continued development and implementation planning of the rapid transit strategy recognizing the impact on asset management associated with the significant expansion in the nature and extent of assets to be employed;
- ensuring fixed (capital) assets are maintained in a state of good repair – meaning preventive and predictive maintenance are current and dynamic reflecting the change in the nature and extent of fixed assets being employed. This will require not only ensuring the recommendations related to the review of fleet operations are acted upon in a timely manner, but that there is ongoing review supporting continuous development and improvement of maintenance programs;
- completion and implementation of the Technology Plan as appropriate, noting the plan is expected to have an impact in defining new capital investment (replacement, upgrade and

expansion);

- re-assessing (cost/benefit) of the “standardization” strategy as it relates to fleet and fleet components. The re-assessment is made necessary given the changing dynamics of the bus manufacturing industry; and
- assessing the need for and utility of having an Information Office in the Dundas/Richmond Street area.

The above are identified as individual work program initiatives or part of a broader defined work program initiative.

In the medium to longer term, asset management (acquisition, utilization and maintenance) will be significantly impacted by:

- the phased implementation of the rapid transit strategy – in terms of fleet requirements and facility capacity; and
- the staged demolition and rebuilding of the 450 Highbury Ave. N. facility