

8.3.3 Forestry

8.3.3.1 What do we own and what is it worth?

Please refer to section 5.1.1 for general context and appropriate asset management interpretation of this section's specifics.

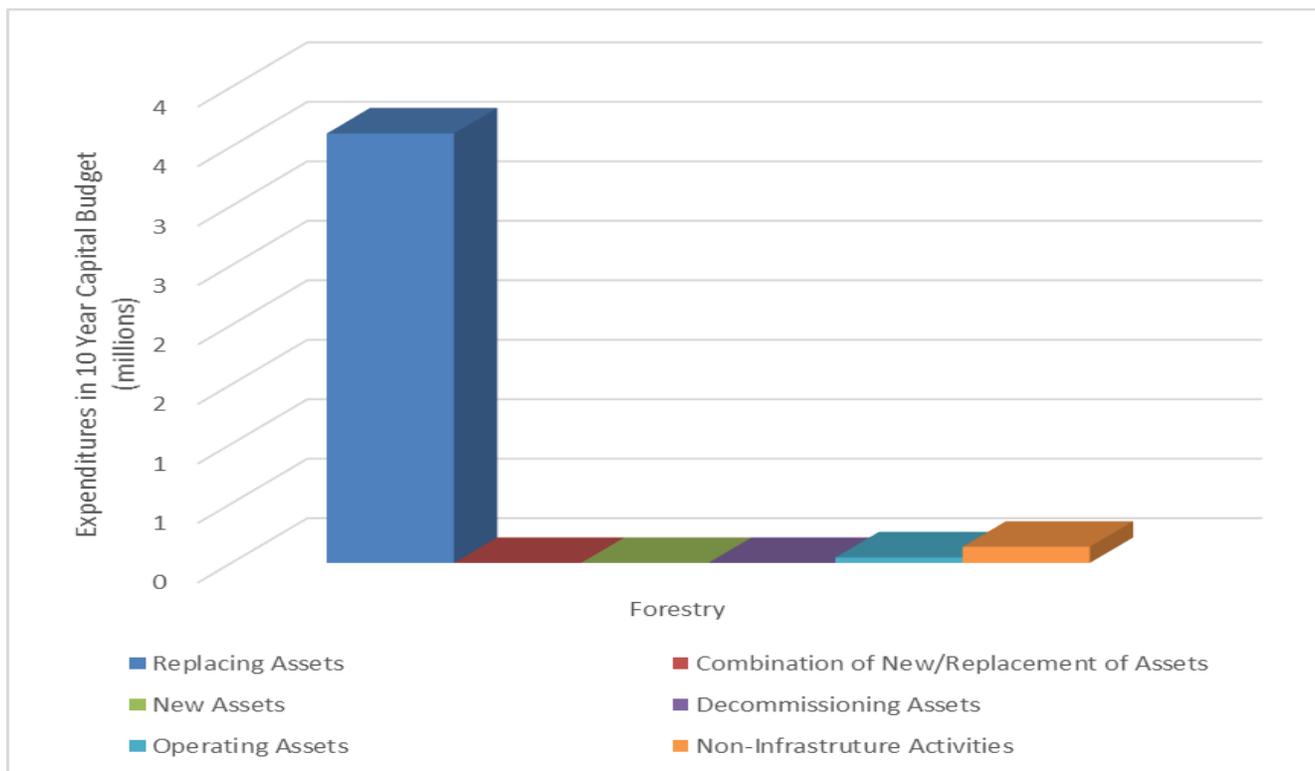
The urban forest is comprised of street trees as well as all the trees on city owned lands, open spaces and woodlots. At this time, the forestry asset class is primarily comprised of the 30,000 street trees in Waterloo. The total replacement value of the forestry assets is approximately \$75 million, which represents approximately 2.9% of the total replacement value of the City's assets.

8.3.3.2 Allocation of Infrastructure Funding

Please refer to section 5.1.2 for general context and appropriate asset management interpretation of this section's specifics.

As indicated in Section 4.3, the capital budget has the most significant portion of funding allocated for the City's infrastructure assets. Forestry assets have an estimated \$4 million in funding allocated in the Approved 2020-2022 Capital Budget and 2023-2029 Capital Forecast. The distribution of the funding is shown in **Figure 49**.

Figure 49: 2020-2029 Capital Funding Distribution for Forestry



The City also spends money on infrastructure through its annual operating budget.

Table 7 in Section 4.3 provides a summary of the planned expenditures in the 2020-2022 operating budget. Approximately \$535,000 million or 0.3% of the operating budget is considered to be directly related to treating the urban forest. For example, the Forestry operating budget includes \$275,000 for inspecting and elevating trees within the City.

8.3.3.3 Rehabilitation or Replacement Strategies

Please refer to section 5.1.3 for general context and appropriate asset management interpretation of this section's specifics.

Street trees are removed and replaced when they reach the end of their useful life (i.e. reach a performance of 0%, with confirmed deterioration). The useful life can vary widely depending on the species of tree and location in the road right-of-way.

8.3.3.4 Lifecycle Management Activities

Please refer to section 5.1.4 for general context and appropriate asset management interpretation of this section's specifics.

For Forestry maintenance the following lifecycle management activity options exist, but are not limited to:

- Trimming/pruning
- Tree elevation

For Forestry rehabilitation the following lifecycle management activity options exist, but are not limited to:

- Localized removal and replanting

For Forestry replacement the following lifecycle management activity options exist, but are not limited to:

- Removal and replanting program

The Waterloo DSS is used to forecast the Forestry asset class performance and corresponding expenditure over a 25-year span. Once the forecast activities are within the one to three year span, SMEs determine the appropriate treatment within the forecasted general categories above. In doing so, all available information relating to items listed in **Table 10 and Table 11** is considered by the SMEs in order to determine the treatment of optimal cost/benefit to the community. It is not atypical to adjust treatments and costs from the original forecast. This is because more information becomes available closer to the start of the project (i.e. inspection, etc.). However, the total projected performance and expenditure for the year are not impacted. This is because the limits of scientific forecasting occur at the aggregate level of asset class performance and spending.

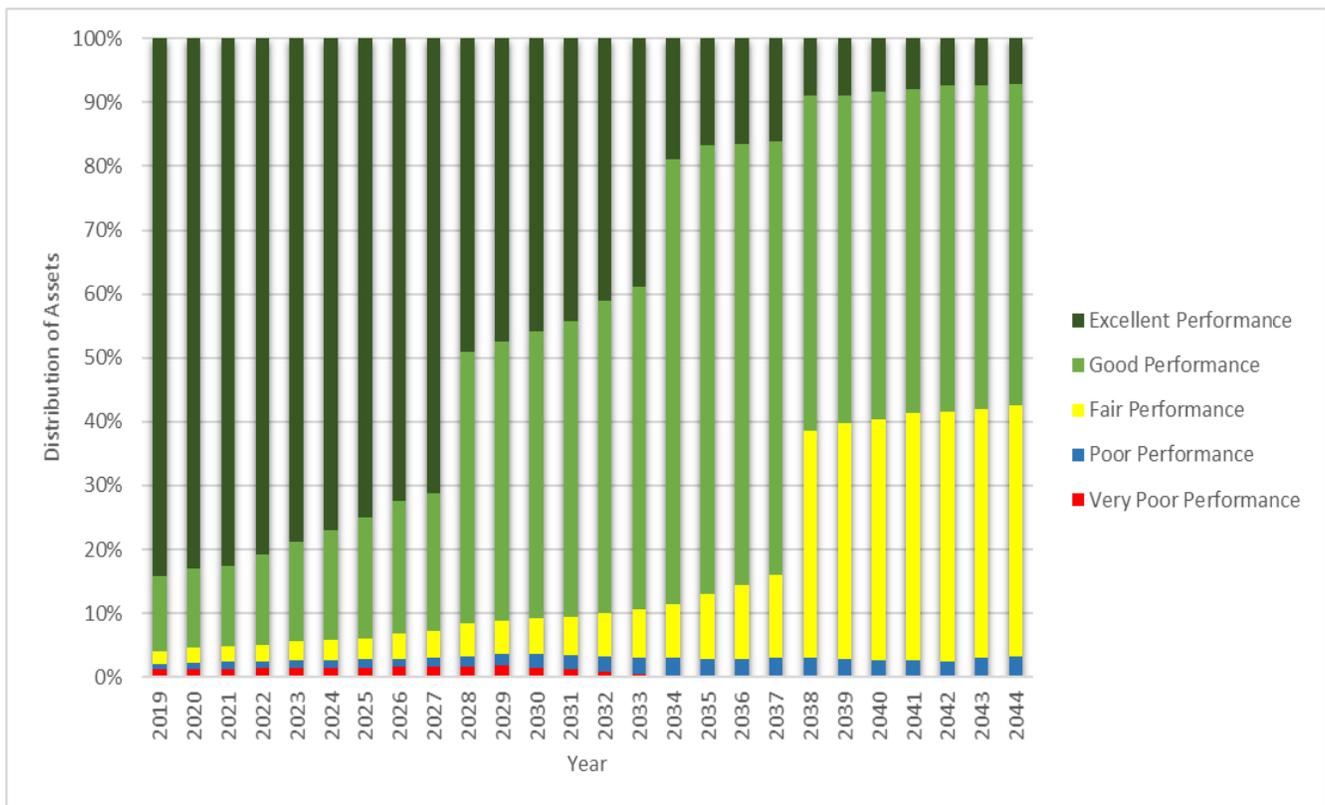
8.3.3.5 Level of Service

Please refer to section 5.1.5 for general context and appropriate asset management interpretation of this section's specifics.

8.3.3.5.1 Current Performance and Projected impact of Budgeted Capital Expenditures

It is estimated that 2% of street trees have poor or very poor performance profiles and are reaching the end of their useful life. External factors impacting the life of street trees such as pests (i.e. Emerald Ash Borer) and their respective influence on trees will be considered for future asset management plans. Based on the currently available information, the average annual budgeted capital expenditures of approximately \$300,000 will result in a performance profile that is anticipated to be acceptable to most stakeholders. The portion of asset class with fair, good, and excellent performance profile is maintained around 97% over the 25-year span as illustrated in **Figure 50**. The remaining portions of the asset class have poor or very poor performance profiles up to 2034, at which time the very poor performance profile is eliminated.

Figure 50: Annual Performance of Forestry assets in the Budget Scenario



8.3.3.5.2 Target Performance and Required Expenditures

As described above, the current budgeted expenditures are expected to be in the general range that is required to achieve the target performance for street trees.

8.3.3.5.3 Ontario Regulation 588/17

Service levels are defined in two terms, community levels of service and technical levels of service. O. Reg. 588/17 identifies specific metrics for core assets that municipalities must report on however metrics for non-core assets are to be developed by each municipality. As a non-core asset, Forestry metrics will be developed and included in the 2023 AMP. These will be as necessary, sub-sets of the comprehensive Level of Service already developed by the City, as shown in the previous two sections.

8.3.3.6 Demand Management Plan

Please refer to section 5.1.6 for general context and appropriate asset management interpretation of this section's specifics.

Demand for new services is driven by various factors such as population change, regulatory requirements, changes in demographics, seasonal factors, consumer preferences and expectations, technological changes, economic factors, environmental awareness and climate change. Climate change is a major factor for Forestry assets due to the increased severity of both summer and winter storms that cause significant damage to the urban forest canopy as well as invasive pests and diseases.

Demand will be managed through a combination of managing existing assets, upgrading existing assets, providing new assets, and demand forecasting. Demand management practices can include non-asset solutions, insuring against risks and managing performance.

The Waterloo DSS will be used to assist Forestry SMEs in demand management planning.



8.3.3.7 Risk

Please refer to section 5.1.7 for general context and appropriate asset management interpretation of this section's specifics.

Risk related to the Forestry asset class is managed through:

- SME knowledge and expertise
- Data-driven decision making
- Performance and expenditure forecasting

This three-pronged approach ensures that Forestry' Level of Service (i.e. performance) supports the community's socioeconomic growth over the short and long term. The Waterloo DSS allows staff to ensure that the future probability of underperforming infrastructure and its consequences is minimized.

In addition to their inherent expertise, in order to minimize risk, SMEs always consider a wide range of factors during infrastructure decision-making processes, the core of which are included in **Table 11**. All corporate information related to Forestry asset management is centralized within the Waterloo DSS, allowing staff to make comprehensive and informed decisions. The ability to forecast the effects of contemplated decisions increases the reliability of the infrastructure's future performance.

8.3.3.8 Conclusion and Next Steps

Based on available information, a difference between Budget (existing) and Target Levels of Service (i.e. infrastructure performance) over the next 25-years is not expected at this time.

In order to ensure management of Forestry assets continues to be optimal, future asset management steps will aim to find the most efficient means of maintaining the performance forecast.

Strategic steps will include:

- Continuous effort in increasing performance data collection capabilities
- Continuous improvement of the Waterloo DSS analysis capabilities
- Continuous improvement of forecasting logic
- Corporate awareness and training

Tactical steps will include:

- Minimizing impact on staff time with respect to sharing information required for the Waterloo DSS
- Increasing awareness of the difference between project level (most granular asset inventory) and network (asset class) level application of asset management principles
- Increasing awareness of general forecasting principles

Operational steps will include:

- Where applicable, developing data collection templates and means
- Continuous engagement with SMEs on progress
- Improving consumer-based modelling parameters