3.2.3 Prioritization and Pacing of Investments (5.4.2.c)

The forecasted investment plan for the Enersource RZ is realistic and takes into consideration customer expectations and preferences, public policy responsiveness and stakeholder requirements. Alectra Utilities prioritizes projects and programs based on a set of key elements or business values, and assessments are made regarding investment proposals which have the greatest impact on those business values. Due to resource constraints (e.g. funding, labour availability, IT support) and other considerations such as rate impacts for customers, other stakeholder and environmental requirements, projects and programs are selected and prioritized based on supplemental quantitative and qualitative analysis.

One of Alectra Utilities' primary goals is to pace and prioritize capital investments in a manner that considers resource needs and customer rate impacts. To meet this goal, Alectra Utilities reviews and analyses programs and projects both qualitatively and quantitatively.

The pace of investment during the 2017-2022 period is driven mainly by System Renewal needs. The rationale and decision-making framework that ultimately yielded the proposed pacing are described in Section 2.1.2. At a high level, the long-term objective of the Enersource RZ CAMP is to achieve an investment plan that is:

- Risk based: Incorporate risk management appropriately into decision-making strategy;
- Sustainable: Optimize asset life cycle value;
- Multi-disciplinary: Asset management accountability framework crosses departmental and discipline boundaries;
- Integration Oriented: View assets in their total relative value context;
- Optimal: Strike the right balance among competing objectives, such as short-term performance and reliability versus long-term planning and sustainability; and
- Systematic: Rigorously applied in a structured management system complete with a monitoring framework and evidentiary structures and tools.

An asset reaches its economic end-of-life when the annualized capital cost of replacing the asset becomes less than the annualized risk cost of continuing to operate the asset. Replacing the asset sooner than the optimal intervention time risks wasting its remaining useful life. Conversely, replacing the asset after the optimal intervention time risks incurring unnecessary and avoidable costs associated with asset failure. The objective of this risk-based approach is to minimize the total lifecycle or operational cost of the equipment in order to maximize the value derived from the assets. Alectra Utilities believes that through efficient and effective planning, it can renew a portion of its distribution system annually in order to help reduce customer outages, weather related failures, and mitigate environmental concerns, while ensuring just, reasonable, and predictable distribution rates.

Over the last few years, the Company has been increasing its inspections, reviewing outage data more rigorously, as well as striving to implement additional analytical methods to help determine the optimal timing of asset replacements. By leveraging the increased asset data that is being collected and analyzed, the Company now has the ability to replace assets based on condition and performance more effectively. The goal is to continually improve the information and techniques used during the decision making process in order to better match the asset's economic end-of-life value with its expected useful life. Thus, the Company is working towards striking the right balance between competing objectives, such as short-term performance and reliability versus long-term planning and sustainability.

The Company plans to significantly increase its System Renewal projects over this Enersource RZ DSP timeframe based on needs identified as a result of the additional information that has been collected and analyzed. This additional information indicates that a sizable portion of the Enersource RZ's distribution assets need to be replaced due to condition or performance concerns, so as to more effectively match the economic and useful lives of the assets. Discussions have been held with potential third-party contractors that are committed to increasing their workforces over the next few years in order to meet the forecasted renewal project and program increases with respect to the Enersource RZ.

To ensure the Enersource RZ's distribution system continues to operate safely and reliably, increased investments are required due to the age and condition of a significant portion of overhead and underground assets. The Enersource RZ has also experienced significant increases in O&M costs over the last few years, due to equipment failures and deteriorating assets conditions, Alectra Utilities is committed to reversing this trend. In this regard, it is important to note that while asset age is a relevant factor in Alectra Utilities' decision making process (particularly where detailed asset information may be lacking), it is by no means a determinative input. Rather, Alectra Utilities strives to assess the condition of Enersource RZ assets through enhanced inspections and data collection, and considers a host of variables in identifying and prioritizing investment needs, including corporate objectives, operational requirements and constraints, criticality, reliability performance, new capacity requirements, regulatory requirements, and stakeholder preferences and impacts.

3.2.3.1 Identification of Projects

Alectra Utilities combines a top-down and bottom-up iterative approach to prioritize and pace its capital investment requirements while balancing the objectives of long-term operational and financial sustainability and related risks. In this regard:

- Operational sustainability corresponds to the continuous delivery of customer service obligations with respect to the adequacy, reliability and quality of electricity distribution services. The achievement of operational sustainability is dependent on the delivery of necessary capital and operating investments;
- Financial sustainability aligns to the ongoing ability to generate cash flows that are reasonably sufficient to achieve corporate objectives at just and reasonable rates. This includes the maintenance of financial integrity and capital attraction at reasonable rates. Financial sustainability also incorporates customer affordability of service, as this is the ultimate source of regulated cash flow. The achievement of financial sustainability is dependent upon cash flows that are supportive of the necessary investment and operating costs including a reasonable return on capital for other Stakeholders.

Alectra Utilities also identifies other projects based on the other key elements described in Section 1.1.1 of this Enersource RZ DSP:

- Corporate Risk;
- Stakeholder Engagement;

- People/workforce;
- Value Creation; and
- Asset Management.

Projects and Programs are first identified and classified, at a high level, into the following four investment categories:

- System Access investments are modifications (including asset relocation) to a distribution system that a distributor must perform in order to provide customers (including generator customers) with access to electricity services via the distribution system.
- System Renewal investments involve replacing and/or refurbishing system assets to extend their original service life and thereby maintain the ability of the distribution system to provide customers with electricity services.
- System Service investments ensure the distribution system continues to meet distributor objectives while addressing anticipated future customer electricity service requirements.
  General Plant investments are modifications, replacements, or additions to a distributor's assets that are not part of its distribution system, including land and buildings, tools and equipment, rolling stock, and electronic devices and software used to support day to day business and operations activities.

System Access

Projects and programs in this category are driven by Alectra Utilities' statutory, regulatory or other obligations in relation to its customers. Investments usually relate to requests by customers for connections or connection modifications, but also include requests from municipal authorities for a distributor to relocate distribution system assets in order to accommodate infrastructure development or modifications. Consequently, investment budgets for this category can vary from one year to the next depending on business conditions.

Alectra Utilities begins assessing System Access needs in the Enersource RZ by working with the City, Region of Peel, Ministry of Transportation ("MTO"), and other governmental authorities (e.g. Metrolinx) to obtain information regarding their respective road, water main, wastewater, and transit projects anticipated for the next 5 to 10 years.

In the event that the project or program involves replacing a distributor's system assets, Alectra Utilities may also review the asset condition to see whether an asset removed prior to the end of its useful life could be reused somewhere else in the distribution network.

Alectra Utilities considers the following factors and inquiries when trying to determine the impact on the Enersource RZ distribution network, including (where applicable) but not restricted to:

- Timing/priority of implementing the project/program (e.g. LRT);
- Customer preferences or input from customers and other third parties;
- Forecasted cost and scope of the project;
- Whether the solution is the most cost effective;
- Whether other planning objectives (such as future load growth) can be met; and
- What options exist and whether there is a better solution than like for like replacements.

Alectra Utilities considers these projects and programs mandatory, because these investments are required to meet customer service obligations in accordance with the DSC or to remain compliant with other regulatory or legal requirements. This means they will take priority over System Renewal or General Plant investments.

System Renewal

System Renewal projects and programs are driven by the relationship between the ability of an asset or asset system to continue to perform at an acceptable standard on a predictable basis on one hand and the consequences for customers served by the asset(s) of a deterioration to a certain extent (i.e. failure), on the other. Generally, the lower the former and/or higher the latter, the more important it becomes to replace or refurbish the asset(s) sooner rather than later.

Hence, Alectra Utilities' discretion over the timing and priority of projects in this category may lessen over time, such as where assets with high consequence of failure are consistently operating outside applicable operating limits. Alectra Utilities does have some discretion over the timing and priority of System Renewal projects and programs where deteriorating asset condition has little or no impact on system performance and the consequences in terms of the number of customers and criticality of service potentially affected by an asset failure are relatively low.

As outlined in Section 2.1.2 of this Enersource RZ DSP, the following are examples of tools Alectra Utilities uses when identify system renewal projects and programs:

- ACA
- Asset Register (GIS, OMS, SCADA)
- Asset Capacity Utilization/Constraint Assessment
- Historical Period - Customer Interruptions Caused by Equipment Failure
- Reliability-Based 'Worst Performing Feeder'
- Reliability Risk/Consequence of Failure Analysis

Alectra Utilities also considers the characteristics of the assets targeted by a project or program and the consequences of asset performance deterioration or failure, referring to asset performance-related operational targets and asset lifecycle optimization policies and practices and the number of customers in each customer class potentially affected by a failure of the asset(s). Alectra Utilities also uses its customer survey and customer consultation results qualitatively to assess customer impacts (e.g. customer satisfaction) with risk level(s) associated with the identified projects and programs.

System Service

System service projects and programs are driven by Alectra Utilities' expectations that evolving customer use of the system may change and system capacity constraints may adversely impact operations in a manner that challenges Alectra Utilities' service delivery standards or objectives. Alectra Utilities considers the following information when determining capital investment needs in this category:

- An assessment of the benefits of the project for customers in relation to the achievement of the objectives of the investment (Webb MS, Duke MS);
- Information on regional electricity infrastructure requirements identified in the IRRP process that affected the initiation or final configuration of the project (Mini-Britannia MS);
- Whether CDM or other advanced technology can be used to offset or delay the project/program (if applicable);
- Whether there are any reliability, efficiency, safety, and coordination benefits or effects of the project on the Enersource RZ's distribution system;
- Business conditions affecting implementation timing/priority (e.g. resource availability); and
- An analysis of project or program benefits and costs comparing the proposed project to a) doing nothing; and b) technically feasible alternatives to the proposed project considered that meet the same objectives as the proposed project.

Alectra Utilities considers expansion-related system service projects and programs mandatory and will take priority over other System Renewal or General Plant investments because these investments are required to meet customer service obligations in accordance with the DSC or to remain compliant with regulatory or legal requirements. However, Alectra Utilities has some discretion in relation to investments in this category in terms of both initiating a project or program and determining the priority and timing of capital related expenditures.

General Plant

General plant investments are driven by evolving capital needs to support day to day business and operations activities. Relative to the other asset categories, Alectra Utilities has more discretion in relation to general plant investments in terms of both initiating a project and determining the priority and timing of related capital expenditures.

Alectra Utilities uses the following types of information to identify projects and programs in this category:

- Quantitative and qualitative analyses of the proposed project or program, including assessments of financially feasible options to the proposed project or program;
- People/Workforce and public safety;
- Working conditions;
- Condition studies and statutory compliance (e.g. building, refurbishments, vehicles);
- Best practices with respect to routine replacements (e.g., fleet, tools and other computer hardware/software replacement programs); and
- The need to replace assets that are otherwise at the end of their productive life or the continued use thereof represents an unacceptable risk to business continuity (e.g., major upgrades of computer systems such as CIS, etc., that are no longer supported by software and/or hardware vendors).

3.2.3.2 Selection of Projects

After potential projects and programs have been identified, Alectra Utilities determines whether the investment is mandatory. Alectra Utilities will then select the projects and determine available technical alternatives that will meet the desired outcomes and/or appropriate investment levels at the department level.

<u>System Access</u>

As stated above, Alectra Utilities forecasts System Access projects and programs by taking into account the following considerations and inquiries:

- Timing/priority of implementing the project/program (e.g. LRT);
- Customer preferences or input from customers and other third parties;
- Forecasted cost and scope of the project;
- Whether the solution is the most cost effective;
- Whether other planning objectives (such as future load growth) can be met; and
- What options exist and is there a better solution than like for like replacements.

Alectra Utilities uses this information to forecast the number of new customer connections, modifications to existing customer connections, expansions for customer connections or property development or other 3rd party infrastructure development requirements. Other system modifications for property or infrastructure development (e.g. LRT and road projects) are selected or forecasted based on information received from the City, the Region of Peel, the MTO, and other Government authorities such as Metrolinx in relation to their respective road, water main, wastewater and transit projects anticipated for the next 5 to 10 years.

Alectra Utilities works with these other third parties to determine requirements, expected timing and other utility constraints, environmental or other significant distribution system constraints and options. The final selection of System Access projects and programs included in this Enersource RZ DSP are based on inputs received mainly by external organizations as well as assessments of available workforce resources.

System Renewal

After identifying a list of potential System Renewal projects and programs, Alectra Utilities receives input from internal subject matter experts in order to identify other risk areas and projects required to maintain the reliability and safety of the distribution system. Environmental and asset condition assessments are conducted, at which time urgent or immediate risks and issues are noted and prioritized. In some cases, simple maintenance tasks are not sufficient, prompting the need for a capital renewal project. In these situations a project is initiated, designed, planned and estimated to fix the problem(s).

System renewal projects and programs are ranked based on the various drivers (e.g. end of life asset replacement, meeting customer expectations and preferences, environmental risk mitigation, etc.). Once the full list of potential investments have been ranked, Alectra Utilities will determine resource availability, assess financial constraints and determine the overall System Renewal project portfolio. The pacing of System Renewal investments is described below.

The majority of System Renewal projects and programs selected and included in this Enersource RZ DSP are intended to address:

- Environmental concerns (e.g. transformer replacement and remediation project)
    - Distribution transformers that are showing signs of leaking and need to be replaced to ensure the risk of environmental impact (i.e. soil contamination), regulatory non-compliance (i.e. federal and provincial environmental regulations), public safety (i.e. health implications) and financial impact (i.e. high costs of environmental cleanup and soil remediation) are minimized.
- Specific underground asset equipment performance and condition assessments outside system average SAIDI and SAIFI performance and condition levels (e.g. underground cable replacements)
    - Underground cables that have been flagged in ACA as one of the assets with the worst HI, which is evidenced by an increasing frequency in cable faults, which is a main driver in high SAIDI over the historical period (see Section 2.3.1.1.5).
- Other ACAs (e.g. overhead pole replacements, substation assets)
    - Distribution poles that through field inspections (both visual and drilling processes) have confirmed that the remaining strength of the poles falls outside of the industry-accepted level and need to be replaced proactively to ensure they don't fail and cause reliability and safety impacts, both to employees and the public (see Section 2.3.1.2).
    - Substation transformers and switchgears that are reaching the end of useful life and need to be replaced to ensure a reliable supply of power (see Section 2.3.1.3).

<u>System Service</u>

Alectra Utilities selects System Service projects and programs by considering and assessing:

- Expected changes in load that will constrain the ability of the system to provide consistent service delivery;
- Capacity upgrades (by type); e.g. phases; circuits; conductor; voltage; transformation; regulation line extensions;
- System operational objectives (i.e. safety, reliability, power quality, and system efficiency);

- Other performance/functionality (e.g. Automation (new/upgrades); and SCADA upgrades/or enhancements).

As stated above, Alectra Utilities considers expansion-related System Service initiatives mandatory, because these investments are required to meet customer service obligations in accordance with the DSC and/or to remain compliant with regulatory or legal requirements. However, Alectra Utilities has some discretion in relation to investments in this category in terms of both initiating a project and determining the priority and timing of capital related expenditures.

General Plant

General Plant Capital projects are principally undertaken to provide for:

- The sustainment of assets supporting electricity distribution service such as facilities, fleet, tools, and IT assets; and
- The enhancement of electricity distribution service through investments that support productivity and more effective customer service delivery.

General Plant Capital expenditures that support productivity are generally identified as a result of process improvement or process optimization investigations (e.g., changes to planning and scheduling, process optimization through new or upgraded systems, etc.). General Plant Capital expenditures that provide more efficient and effective customer service delivery are generally identified as a result of evolving customer trends and supporting technology (e.g., web-based self-service technologies, outage management systems and processes, etc.).

General Plant investments address the sustainment and enhancement of electricity distribution services, as described above, in the following areas:

- IT Investments:
  - Regulatory Requirements;
  - Business sustainment continuity and operational risk mitigation;
  - Hardware and software to support corporate productivity and customer preferences;
  - Obsolescence;
  - Operational efficiencies (e.g. MWM tool).

- Facilities:
  - Building renewal and renovation projects driven by requirements from asset condition studies;
  - Business continuity and risk mitigation.
- Fleet:
  - Condition Assessments;
  - Obsolesces;
  - Workforce needs and technology improvements;
  - Risk mitigation.

3.2.3.3 Prioritization of Projects

Alectra Utilities systematically plans and evaluates its multi-year project portfolio and creates a prioritized list of projects that are used as the basis for the capital expenditure plan included in this Enersource RZ DSP. The optimization of future programs and projects allows Alectra Utilities to invest in the appropriate areas of the distribution system and General Plant assets in order to mitigate risk and improve overall value.

As stated, Alectra Utilities considers expansion-related System Service and System Access investments to be mandatory. The programs and projects that fall under System Renewal involve replacing and/or refurbishing system assets to extend the original service life of the assets. Modifications fall under General Plant: for example, replacements or additions to Enersource RZ assets that are not part of the distribution system, including land and buildings, tools and equipment, rolling stock and electronics devices and software used to support day-to-day business and operations activities.

<u>System Access</u>

As stated, Alectra Utilities works with external partners to determine System Access needs. The final prioritization and selection of System Access initiatives included in this Enersource RZ DSP are based on the projected timing of the work as well as the availability of resources to perform the work.

System Renewal

The high volume of assets in poor health and level of investment required to address these assets cannot be addressed in a single year and requires a multi-year investment plan. Capital investment projects and programs are developed to provide this multi-year plan for the renewal of the prioritized assets. The capital investment projects and programs form the basis from which candidate renewal projects and programs are selected and developed for inclusion in the annual budget process.

- Asset Renewal – Underground Cables

  As discussed in Section 2.2.3.9, the underground cables are flagged as one of the distribution assets with a deteriorating condition. Alectra Utilities recognizes that its underground cables are one of the main drivers to worsening reliability, as evidenced in the SAIDI historical trends, and that we are required to mitigate this risk. Enersource RZ customers, through customer engagement, have also recognized that the distribution system is aging and considerable portions of its system, namely underground cables, are reaching the end of useful life. This is further reinforced by a worsening reliability performance trend (i.e. in 2016, over 80% of equipment failures were caused by cable faults) that has been flagged during the asset management process. Alectra Utilities is striving to reverse this trend through the planned replacement of underground cables and the renewal of the subdivision underground system, where multiple cable faults have occurred. This asset management methodology to addressing this risk is further discussed in Section 2.3.1.1.4. By overlaying various types of asset information, Alectra Utilities is able to identify worst performing areas that would be appropriately addressed through a planned bundled replacement, rather than a spot like-for-like replacement.

- Asset Renewal – Poles

  Similar to underground cables, Alectra Utilities applies the overlaying methodology to identify poles for replacements, prior to their failure, in order to ensure reliability and address safety risks (e.g. falling poles). As discussed in Section 3.5.2.2.2, to identify assets for renewal and address multiple risks to the extent possible, Alectra Utilities utilizes field inspection data, information regarding potentially leaking transformers, and vintage and type of pole accessory (e.g. open bus secondaries, porcelain insulators prone to failure due to tracking and cracking).

By overlaying several pieces of asset information, such as historical reliability performance, asset condition, and inspection and maintenance information, Alectra Utilities is able to identify worst performing areas that would be appropriately addressed through a planned bundled replacement, rather than a spot like-for-like replacement.

- Asset Renewal – Distribution Transformers

Historically, due to a minimal reliability impact to a failed distribution transformer (e.g. pad mount transformer feeding a dozen residential homes) these assets were run to failure. However, due to an introduction of both federal and provincial environmental regulation along with heightened awareness of environmental impact on having leaking transformers present in customer's back yards and public spaces (e.g. schools, water ways) and the need to replace transformers and carry out environmental assessment and soil remediation, where needed, Alectra Utilities has reassessed the overall risk due to failure mode, specifically transformer leaking. As such, Alectra Utilities recognizes that the risk of transformers showing signs of leaking needs to be addressed due to the following:

- Environmental impact (i.e. soil contamination)
- Regulatory non-compliance (i.e. federal and provincial environmental regulations)
- Public safety (i.e. health implications)
- Financial impact (i.e. high costs of environmental cleanup and soil remediation)

Due to the following reasons, since 2013, the transformer replacement project has been targeting transformers exhibiting signs of leaking and/or containing PCB oil. Since the start of the project, approximately $19.4MM has been incurred in capital expenditures and $5.6MM in environmental remediation costs, which are not recovered (through rates) from Enersource RZ customers. The Enersource RZ currently has nearly 2,000 transformers remaining with indicated signs of leaking that need to be replaced. The replacement of these assets would allow Alectra Utilities to minimize the above noted risks.

System Service

These Investments are non-renewal in nature and support the expansion, operation and reliability of the distribution system. The level of expenditure in the short term is also prioritized based on resource requirements to execute on proposed plans. System Service projects and programs identified above are submitted for project prioritization and assessed based on overall project effectiveness, value, and timing.

Substations assets (including power transformers and switchgear) are considered to be critical to maintaining business continuity and management and operation of the distribution system and providing reliable power to the Enersource RZ's diverse customer base. Loss of a substation transformer can significantly impact customer outage minutes and affect a large number of customers. As discussed in Section 2.3.1.3.1, Alectra Utilities takes a thorough and systematic approach to managing substation assets and relies on ACAs, field inspection, maintenance, historical failures information, and equipment obsolescence to determine the need for the renewal and proactive replacement of substation assets.

General Plant

General Plant expenditures are identified based on, as applicable:

- Recommendations and results of asset condition studies with an emphasis on the urgency and pacing of investments to balance customer and utility affordability;
- Statutory compliance requirements;
- Experience embedded within best practices for replacement or incremental investment to industry performance standards;
- The time that incumbent assets will be at the end of their productive life;
- The opportunities to harvest productivity; and
- Customer preferences and trends with respect to electricity distribution service quality.

Alectra Utilities strives to ensure its hardware and software are reasonably current in terms of the version releases and availability of required upgrades. For example, software is only upgraded once all reasonable options are considered and deemed inadequate to meet current business needs.

Reasons to upgrade include:

- Lack of vendor support;
- Costly vendor support;
- Lack of compatibility with versions used by business partners and customers;
- New features can be obtained which provide additional functionality to improve efficiency;
- Lack of compatibility with new software or hardware;
- Probability of failure/service interruption;
- Support costs (once systems are beyond warranty); or
- Challenges with interoperability and integration.

3.2.3.4 Pacing of Investments

The pacing and prioritization of all capital investments are ultimately resolved through:

- Balance between the operational and financial sustainability objectives underlying corporate and asset management strategies;
- Output of the system, asset condition, and operational performance planning activity components of the asset management framework and general plant project assessments and identification processes;
- Customer expectations;
- Rate impacts;
- Cash flow and other financial constraints/requirements; and
- Overall risk mitigation and corporate vision.

<u>System Access</u>

Since Alectra Utilities considers System Access projects and programs mandatory, the pacing of System Access projects can have a major impact on other capital investments included in this Enersource RZ DSP. For example, if the final timing of System Access projects and programs included in this Enersource RZ DSP end up being different than the forecast, the availability of resources to perform the work may have to be moved from other System Renewal projects. Ultimately, this could impact Alectra Utilities' ability to execute the overall investment plan as intended.

System Renewal

Overall, the Company plans to significantly increase its System Renewal projects over this Enersource RZ DSP timeframe. To ensure safety and reliable distribution system operations, increased investments are required in response to the deteriorating condition of a significant portion of the Enersource RZ's overhead and underground systems. The Enersource RZ has also experienced significant increases in O&M costs over the last few years, largely due to the condition of aging assets. Alectra Utilities is committed to reversing this trend.

The Enersource RZ's historical high standard of maintenance and sustainment practices has resulted in most of the distribution system assets being in an acceptable operational state. However, over the course of time and standard use, a large number of assets are expected to require replacement at increasing rates over the near and mid-term, especially transformers which are exhibiting signs of leaking and the condition/performance of underground cables. Alectra Utilities has considered the pacing of those investments and its effect on customers and is proposing a "paced" execution strategy, designed to achieve a steady state in a gradual manner. This "paced" strategy allows for steady capital investments and predictable rate impacts for customers during the 2017-2022 period and beyond. While it would be possible, and optimal from a system perspective, to invest more aggressively today to eliminate the backlog of investments sooner, Alectra Utilities believes that its proposed plan, which is more moderate and predictable, fairly balances the needs of current and future customers and will help mitigate future surges in capital commitments over the long-term.

System Service

Since Alectra Utilities considers expansion-related System Service projects and programs mandatory, the pacing of System Service projects can have a major impact on other capital investments included in this Enersource RZ DSP. For example, if the final timing of System Service projects and programs included in this Enersource RZ DSP end up being different than the forecast, the availability of resources to perform the work may have to be shifted from System Renewal projects. Ultimately, this could impact Alectra Utilities' ability to execute the overall investment plan as intended.

General Plant

Before finalizing General Plant investments scheduling and pacing, Alectra Utilities considered the proposed investment levels for System Access, System Renewal and System Service. After this assessment, Alectra Utilities determined that its General Plant investment proposals needed to remain flat over the next five years, compared to spending in this area over the previous five years. By pacing General Plant investments over the Enersource RZ DSP time frame, Alectra Utilities is able to maintain a relatively stable year-to-year investment plan that ensures sufficient cash flows and an appropriate utilization of labour resources.

3.2.3.5 Overall Financial Impact

Another important input to the capital expenditure planning process is the estimated financial impact resulting from the proposed projects, including on current distribution rates. To this end, individual projects are evaluated based on the following three financial performance categories:

- Cost efficiency. Depending on whether the project is expected to save or avoid operational costs, a score is assigned based on the potential magnitude of the savings or avoided costs.
- Ongoing costs. Depending on the costs to be incurred due to the project on an ongoing basis, a score is assigned based on the potential magnitude of such costs.
- Rate impact. The rate impact stemming from the project is calculated. A higher score is assigned to projects with a lower customer bill impact. The age and type of assets being replaced are considered in calculating the impact on revenue requirement over the five year DSP period.

Once individual projects have been prioritized based on all relevant considerations, including the three financial performance factors noted above, an overall evaluation is completed across all projects for the DSP period. This ensures that the outcome of the project-level bottom-up analysis is also tested through the lens of top-down considerations. Based on the identified individual projects and the total capital expenditure plan for the DSP period, a total bill impact for each rate class is calculated. The overall rate impact for the portfolio is then reviewed by Executive Management to determine whether to proceed with the projects or to adjust or levelize the portfolio to mitigate rate impact.

3.2.4 Mechanisms Used by the Distributor to Engage Customers (5.4.2.d)

Stakeholder engagement and value creation are two of the key corporate values that have underpinned the management of Enersource RZ assets and the development of this DSP. In addition to its ongoing customer engagement activities, Alectra Utilities has completed two customer engagement initiatives in relation to the Enersource RZ DSP, with the first being completed in 2016 and the second in 2017. Alectra Utilities has taken into account the feedback it has received through ongoing engagement activities, as well as the findings resulting from each of the two engagement initiatives, in the development and finalization of this Enersource RZ DSP.

For details on the mechanisms used by Alectra Utilities to engage customers on an ongoing basis, please refer to Section 1.2.2.3. For details on the aspects of this Enersource RZ DSP that has been particularly affected by consideration of customer feedback, please refer to Section 3.1.6.

3.2.5 Method and Criteria Used to Prioritize REG Investments (5.4.2.e)

Alectra Utilities prioritizes REG investments based on customer requests and follows regulated timelines outlined in the OEB's DSC. Alectra Utilities works closely with customers, HONI, the IESO, and the ESA to integrate all proposed residential and commercial customer generation projects into the grid. As outlined in Section 3.3, numerous projects of varying generation capacity are proposed and connected to the distribution system every year.

The connection process for integrating the generation projects into the distribution system involves the following:

- Analyzing the generation capacity of the connecting feeder and interface transformer;
- Verifying that the relevant substation transformer can accept reverse flow;
- Ensuring that the short circuit changes and voltage fluctuations will cause no material impacts on either the distribution or transmission grid;
- Reviewing the proposed single line diagram, electrical protection scheme and site plan for adherence to all Enersource RZ, ESA, and IESO standards and requirements.

In instances where proposed generation connection is not possible, Alectra Utilities will work with the customer to provide an alternative solution. This solution may involve expanding the distribution system to meet customer needs or relocating the project to a property that meets all applicable connection requirements. Where work on the distribution system is required for the connection, the project is coordinated to ensure regulatory timelines are met while optimizing crew time.

5.3.3 ASSET LIFECYCLE OPTIMIZATION POLICIES AND PROCEDURES

An understanding of a distributor's asset lifecycle optimization policies and practices will support the regulatory assessment of system renewal investments and decisions to refurbish rather than replace system assets. Information provided should be sufficient to show the trade-off between spending on new capital (i.e. replacement) and life-extending refurbishment, and should include but need not be limited to:

a) A description of asset lifecycle optimization policies and practices, including but not necessarily limited to:

- *a description of asset replacement and refurbishment policies, including an explanation of how (e.g. processes; tools) system renewal program spending is optimized, prioritized and scheduled to align with budget envelopes; and how the impact of system renewal investments on routine system O&M is assessed;*
- *a description of maintenance planning criteria and assumptions; and*
- *a description of routine and preventative inspection and maintenance policies, practices and programmes (can include references to the DSC).*

b) A description of asset life cycle risk management policies and practices, assessment methods and approaches to mitigation, including but not necessarily limited to the methods used; types of information inputs and outputs; and how conclusions of risk analyses are used to select and prioritize capital expenditures.

Asset Replacement and Refurbishment (Remediation) Program and Policies

PowerStream has several asset remediation programs for maintaining distribution system and general plant integrity.

PowerStream makes assessments on whether an aged asset is suited for refurbishment or replacement based on criteria that are pertinent to a given asset class.

A large contributor to the assessment process is the annual inspection of critical assets. Annual inspections are completed on the distribution system for the overhead system, load interrupter switches, padmount switchgear, vault rooms, padmounted switchgear, stations and poles. An assessment is made and an asset will be categorized as a Code A, Code B or Code C:

- Code A: Corrective measures/follow-up are required at the earliest possible opportunity (address immediately);
- Code B: Assessment required for corrective action for the next budget cycle; and
- Code C: No corrective measures are required. Follow the regular maintenance cycle.

Additionally, testing is performed on cables to determine the health of the cable, and testing is performed on wood poles to determine remaining strength.

These designations are applied to the distribution system assets as seen in Figure 1. This table depicts, by asset, what the health index scores mean, what the inspection results mean, and how the scores are prioritized

Program	Health Index (max score = 100)	Inspection Results (Code A, B, C)	Prioritization Score (max score = 100)
Pole Replacement	not applicable	Used field inspection results to select replacement candidates. **Code A**= Very Bad, immediate replacement **Code B**= Fair, replacement candidate for next budget cycle **Code C**= Good condition, no replacement needed and maintain inspection	A higher point total yields greater replacement priority. (scored from % Remaining Strength, Condition, # of Transformers, # of Primary Conductors, # of Switches, Criticality of Pole and Age of Pole.) **NOTE**: Candidates will belong to one of the following groupings: - Remaining strength is less than 60 % - Remaining strength is greater than 60%, however other aspects of the pole are bad. (i.e.. butt rot, insect infestation, decay, splitting, bending, leaning)
Cable Remediation: Cable Replacement	not applicable	**TAN DELTA TEST RESULTS** **Code A** = Critically Aged. Intervention Required **Code B** = Aged. Further study required. (Repeat testing evey 2 years based on test reults) **Code C** = No Action Required/Repeat after 5 Years	A higher point total yields greater replacement priority. (scored from Age, Cable Condition, Service Quality and Financial Impact)
Cable Remediation: Cable Injection	not applicable	**TAN DELTA TEST RESULTS** **Code A** = Critically Aged. Intervention Required **Code B** = Aged. Further study required. (Repeat testing very 2 years based on test results) **Code C** = No Action Required/Repeat after 5 Years	A higher point total yields greater replacement priority. (scored from Age, Cable Condition, Service Quality and Financial Impact)
Switchgear Replacement	**Good Condition**= high Health Index, >70 **Fair Condition**= middle Health Index, 51-70 **Poor Condition**= low Health Index, <51	Used field inspection results to select replacement candidates. **Code A**= Very Bad, immediate replacement **Code B**= Fair, replacement candidate for next budget cycle **Code C**= Good condition, no replacement needed and maintain inspection	not applicable
Mini-Rupter Switch Replacement	**Good Condition**= high Health Index, >70 **Fair Condition**= middle Health Index, 51-70 **Poor Condition**= low Health Index, <51	Used field inspection results to select replacement candidates. **Code A**= Very Bad, immediate replacement **Code B**= Fair, replacement candidate for next budget cycle **Code C**= Good condition, no replacement needed and maintain inspection	not applicable
Automated Switch Replacement	(**Good Condition**= high Health Index, >70 **Fair Condition**= middle Health Index, 51-70 **Poor Condition**= low Health Index, <51	Used field inspection results to select replacement candidates. **Code A**= Very Bad, immediate replacement **Code B**= Fair, replacement candidate for next budget cycle **Code C**= Good condition, no replacement needed and maintain inspection	not applicable
Submersible Transformer Replacement	**Good Condition**= high Health Index, >70 **Fair Condition**= middle Health Index, 51-70 **Poor Condition**= low Health Index, <51	Used field inspection results to select replacement candidates. **Code A**= Very Bad, immediate replacement **Code B**= Fair, replacement candidate for next budget cycle **Code C**= Good condition, no replacement needed and maintain inspection	not applicable
Distribution Transformer Replacement	**Good Condition**= high Health Index, >70 **Fair Condition**= middle Health Index, 51-70 **Poor Condition**= low Health Index, <51	Used field inspection results to select replacement candidates. **Code A**= Very Bad, immediate replacement **Code B**= Fair, replacement candidate for next budget cycle **Code C**= Good condition, no replacement needed and maintain inspection	not applicable
Station Equipment Replacement	**Good Condition**= high Health Index, >70 **Fair Condition**= middle Health Index, 51-70 **Poor Condition**= low Health Index, <51	**NOTE:** Inspection & testing results are used to generate the health index and replacement candidates.	not applicable

Figure 1: Summary of Health Index Results, Inspection and Testing

The remediation programs for maintaining the distribution system are:

- Pole Remediation (replacement or reinforcement);
- Cable Remediation (replacement and injection);
- Switchgear Replacement;
- Mini-Rupter Switch Replacement;
- Automated Switch Replacement;
- Submersible Transformer Replacement;
- Distribution Transformer Replacement;
- Station Equipment Replacement (Substations & Transformer Stations);
- 44kV Porcelain Insulator Replacement;
- Fault Indicator Replacement;
- Storm Hardening and Rear Lot Remediation;
- Information Systems;
- Facilities;
- Information systems;
- Facilities Remediation; and
- Fleet Replacement.

These are further described below.

<u>Pole Remediation</u>

Through an annual inspection and testing program, PowerStream monitors the condition of its poles to ensure that they meet minimum requirements for safety and reliability. Among other factors, PowerStream is guided in its pole assessment process by Clause 8.3.1.3 of CSA Standard C22.3 No. 1-10, which states that:

> *"when the strength of a structure has deteriorated to 60% of the required capacity, the structure shall be reinforced or replaced".*

In the quote from the CSA standard, the reference to capacity is interchangeable with pole strength for this program.

Other considerations include pole condition information such as rot, decay, splitting, insect infestation, bending, and leaning. PowerStream believes that the remediation of poles exhibiting poor (or worse) condition is non-discretionary. The remediation is required to maintain compliance with the CSA code, as well as considerations for safety of the public and for workers operating in, on, or around the poles and their associated equipment.

When an existing pole is replaced, PowerStream must install the new pole according to the current standards. In most cases the existing associated components attached to the existing pole are also at end-of-life and therefore must also be replaced. Examples of the associated components are brackets, cross arms, down guys, anchors, ground wires, insulators, arresters, and fasteners. If in any particular case, the pole has transformers, switches, or other equipment with significant remaining life, these are salvaged and re-used.

When a pole in reinforced, the base will be restored to full strength. See Figure 2.

Figure 2: Pole Reinforcement Installation

PowerStream annually inspects and tests a portion of pole population. The pole remediation candidates are selected based on the combination worst candidates of the following two groupings:

- Poles that have less than 60% remaining strength (CSA reference); or
- Poles that have more than 60% remaining strength but exhibit worsening conditions such as rot, decay, splitting, insect infestation, bending, and leaning.

Poles are prioritized based on their assessed health index, the worst being selected for replacement or reinforcement. See Figure 3 below.

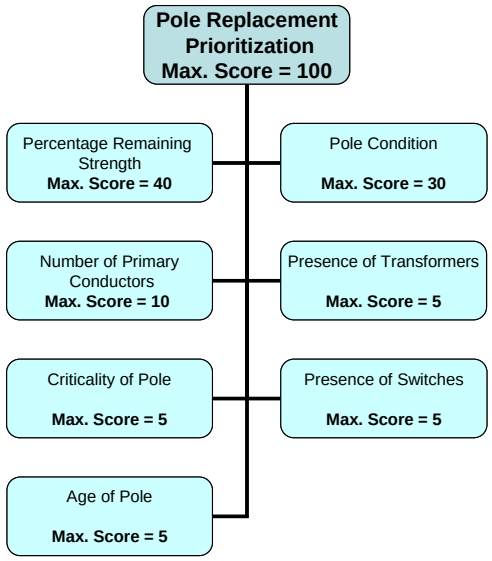

Figure 3: Pole Prioritization Matrix

Cable Remediation

PowerStream monitors the condition of its primary cables to ensure that they meet minimum requirements for safety and reliability. The asset demographics indicate that the oldest cables of the PowerStream cable population are at end-of-life, are deteriorating and are failing. To mitigate the effects of this, annual remediation efforts are required.

To manage the risk of large-scale primary cable failures, PowerStream has implemented a cable remediation plan. The plan includes continuous work on assessing, prioritizing, and remediating the worst cable segments by a combination of cable injection and cable replacement.

PowerStream's approach to managing the high risk cable population is summarized below:

- Use a cable prioritization system to select cable segment "candidates" for replacement or injection;
- Designate prioritized cable candidates for cable injection or cable replacement;
- Address the cable aging issue by a combination of cable injection and cable replacement on a prioritized basis;
- Conduct testing to assess the condition of the cable; and
- Select the preferred method.

In 2011, PowerStream's System Planning division introduced cable injection (a process that restores the insulation in a cable). This process extends cable life at approximately 15% of the cost of cable replacement. PowerStream's preference is to inject cables as a first choice for remediation. Research indicates that cable injection extends the life of cable for another 20 years, however, injection is only suitable and economical for some cable types and field conditions. The initial trials were very successful – low cost and no subsequent failures. The initial cable candidates were limited in age due to technical factors. In 2014, PowerStream did additional research related to the technical factors, and determined that additional cable candidates would be eligible for injection. This efficiency permits the remediation of the same amount of cable at a lower overall cost, or alternatively, permits additional lengths to be accomplished with an equivalent budget.

The cable replacement option is more expensive than the cable injection option with respect to the initial capital cost, but it has the advantage of resulting in new cable that will be utilized for a longer time. In comparing the two options, the extra life expected from injected cable is 20 years while the life of new cable is expected to be 50-55 years.

In order to determine the cable candidates to be selected for replacement or injection remediation means, PowerStream has developed a prioritization methodology which takes into consideration the physical condition of the cable along other factors such as age, impact to customer service and financial benefit. Figure 4 depicts the methodology used to screen and prioritize the candidates selected for injection or replacement.

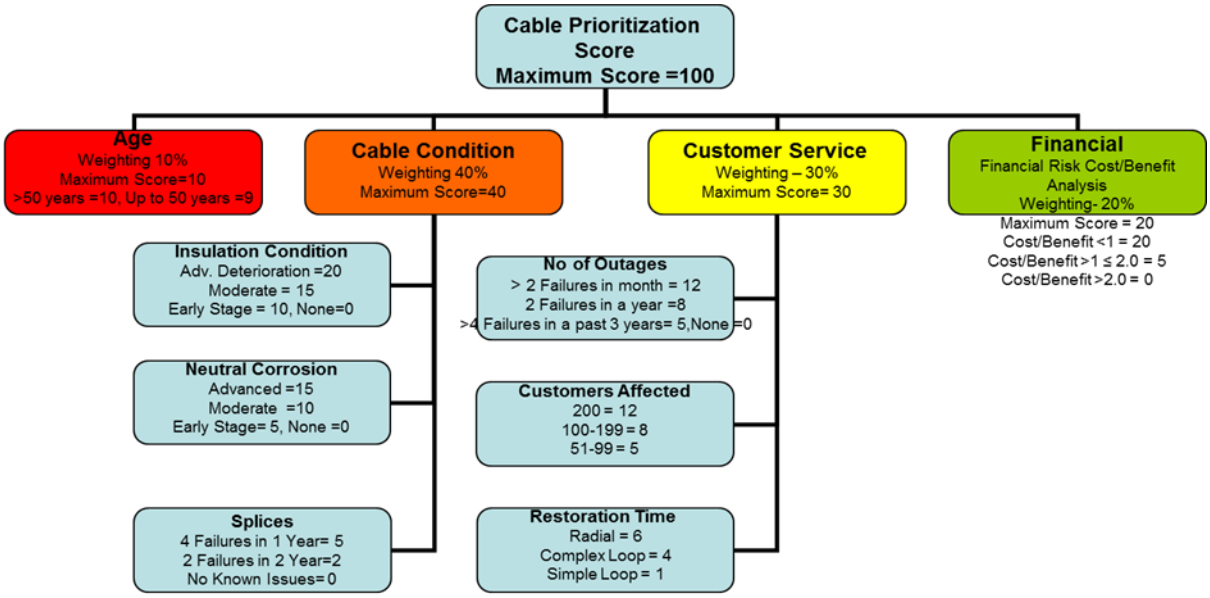

Figure 4: Cable Prioritization Matrix

Cable condition is the key driver and most heavily weighted factor in terms of determining cables for replacement/injection.

The cables that are proposed for remediation exhibit Code A results (advanced insulation degradation) indicating that intervention is required.

In 2010, PowerStream's System Planning division introduced Tan Delta cable testing, a diagnostic method of testing cables to determine the quality of the cable insulation. This testing, when applied within the cable remediation program, provides improved data to assist in determining the optimal approach to remediation – does the cable need remediation, and if so, is injection or replacement the preferred approach? This efficiency results in ensuring that only

poor cables are selected and if injected if appropriate. This lowers the overall cost of the program.

The remaining factors in the prioritization matrix (customer service, financial, age) have decreasing factor weights with age being the lowest. In the absence of any other empirical data, age is the default indicator of when the cable approaches end of life.

Switchgear Replacement

Pad- Mounted Switchgear units are used in distribution loops supplying residential subdivisions and commercial/industrial customers. Switchgear units are used to isolate/control other equipment, and to reconfigure the loops for maintenance, restoration or other operating requirements.

Switchgear degradation depends on a number of factors, such as condition of mechanical components, contamination due to dirt, moisture and corrosion. The other important issues are obsolescence or product specific/generic defects.

Pad-mounted switchgear represent critical assets for the underground distribution system and have been identified to carry a significant reliability and safety risk due to condition, age, past design and installation practices. The population targeted for replacement consists of air and oil switchgears, based on safety and reliability concerns.

Appendix C (Table-1) of the Distribution System Code (DSC) sets out minimum inspection requirements for the distribution system and accordingly for urban environments the underground plant is inspected on a three year cycle. In addition ESA regulation 22/04 mandates that the distribution plant be inspected and any potential safety issues be rectified.

Based on the inspection results each year, and the health index calculation, a number of distribution switchgear are recommended for replacement due to safety concerns, age, and asset condition assessment information.

Mini-Rupter Switch Replacement

Mini-rupter switches are found in distribution loops supplying industrial commercial/industrial customers and are three pole-gang operated interrupter switches used for switching between underground distribution circuits.

Mini-rupter degradation depends on a number of factors, such as condition of mechanical components, contamination due to dirt, moisture and corrosion.

Mini-rupter switches are critical assets that are typically installed in vault rooms and have been identified to carry a significant reliability and safety risk due to condition, age and arc quenching design. There have been several failures of the switches where there has been an arc flash created between an energized component and ground potential. In this case the risk of injury is more pronounced as these switches are located in confined vault rooms. Due to the safety risk associated with failure of units, PowerStream's standard work practices have placed restrictions on switching of these units live, which is contrary to the units performing their intended function.

Based on the inspection results each year, and the health index calculation, a number of switches are recommended for replacement due to safety concern, age, and ACA information.

Automated Switch Replacement

High service reliability and rapid response to power outages is critical to maintain reliability and customer satisfaction.

Remotely controlled switches provide many benefits, which include:

- a rapid transfer of loads in emergencies;
- a reduction in restoration time (which improves reliability);
- a reduction in the number of customers affected by outages;
- flexibility to reconfigure the system to avoid feeder and station over loads during summer peak intervals;
- real time system readings;
- a reduction to the risk of personnel injury; and

- a platform for a complete distribution automation system.

There are identified locations where the automated switches are the end of life and cannot be operated remotely. These locations are selected for replacement.

Submersible Transformer Replacement

This particular model of submersible transformers (known as pole trans or rocket ships) are installed at the bottom of the street light poles, and are used to step down the primary voltage to the lower secondary voltage to supply residential customers. These are a unique installation that includes non-load break primary connections, submersible transformer, NX type fusing and a metal clad covering supporting a municipal street light fixture.

These units date back to 1967 and are at their end-of-life. They are obsolete, are no longer manufactured and spare parts non-existent.

PowerStream has identified the population of transformers of this vintage type and commenced a program to replace transformers each year. The program will be completed within the five years included in this DS Plan.

Distribution Transformer Replacement

Distribution transformers are used in the underground distribution to step down the primary voltage to the lower secondary voltage for use by customers. These transformers may be single-phase or three-phase depending on the customer and type of load. Pad-mount transformers in PowerStream's distribution system consist of a range of transformers from single phase 50kVA units typically supplying residential customers to three phase 3,000 kVA units supplying industrial customers. These transformers are liquid filled, with mineral insulating oil and employ sealed tank construction.

Single phase distribution transformers are generally a run-to-failure asset, unless through inspection, the units present a safety or environmental hazard. For larger three phase distribution transformers supplying commercial or industrial customers, where reduction in

reliability impacts may be high, transformers may be replaced as they near the end-of-life or where they have been identified as overloaded.

Station Equipment Replacement

Transformer stations are a highly complex set of assets working together to supply electricity to the distribution system. Based on demographic and condition data, health indices have been developed and asset data collected on an ongoing basis. Replacements are made as indicated by the health indices.

44kV Porcelain Insulator Replacement;

PowerStream is experiencing a growing number of power interruptions due to insulator failure. It has been found that the older vintage of 44kV porcelain insulators are prone to tracking and flash over. PowerStream is proposing to replace all remaining legacy 44 kV porcelain insulators with polymer type insulators (over the next four years).

Fault Indicator Replacement

PowerStream has deployed fault indicators throughout its distribution system, and the location of the installations are result of mergers of several predecessor utilities. There are several different types of fault indicators currently deployed on PowerStream distribution systems. Some areas have fault indicators heavily deployed, while others have limited numbers installed or no fault indicators at all. This program is a combination of adding fault indication to areas where fault indication is absent, as well as replacing older technology fault indicators that are obsolete or prone to malfunction.

Fault Indicators are significant to the distribution system to reduce fault locating times, improving outage response and, consequently, outage restoration times. The deployment of functional fault indicators are crucial to maintaining high levels of reliability and customer service and to achieving gains in operational efficiency.

Storm Hardening and Rear Lot Remediation

PowerStream has a number of pockets of customers supplied by rear lot (backyard) construction. In general, these areas are older neighbourhoods and the electrical supply systems were installed between 1950 and 1970. As a result, the electrical components are ageing and the assets are deteriorating.

Rear lot supply systems pose reliability, operations, safety, and customer service issues for PowerStream. These concerns are either from a subdivision (many customers), or an individual customer requesting an underground service in a rear lot supply area.

In 2012, a review of the rear lot pockets was performed. There are thirty-six (36) areas of various sizes. These assets are aging, with an average age of years forty-two (42) years, with the oldest being sixty-six (66) years old. These assets pose a potential safety risk to the public due to planting of trees and the installation of sheds and pools close to the lines. The assets are also more inaccessible compared to standard front lot design. Several potential options and associated costs were presented.

In the 2013 ice storm, the longest outage times were faced by customers supplied with rear lot overhead systems. As a result, a second review of the options was performed, and PowerStream is proposing to annually replace areas of the rear lots supplies with front lot standard construction, until they are remediated. Additionally, PowerStream will be reinforcing pole lines and moving equipment located in the basement in transformer stations to above grade (to avoid flooding).

Information Systems

PowerStream's computer assets are required to be reasonably current and in good working order, and the "useful life" has been determined in accordance with current accounting principles. Other factors such as reliability and the impact (cost) of failure remain the primary factors considered in IT asset management decisions.

Table 1 outlines the useful life of information system hardware. PowerStream continuously looks for opportunities to extend the useful life of hardware (and software). The introduction of virtualization, both on the client and server side, has the potential to reduce the dependency on physical hardware.

Asset Class	Useful Life (years)
Switches/Routers	6
Servers (including servers and SAN)	5
MFP's (including all printers)	5
Desktops/Laptops (includes immaterial monitors)	4
Computer Software Application	4
Computer Software Operations (Operating Systems)	3

Table 1: Information System Hardware

PowerStream's policy, with respect to system software, is to maintain software as current as practical, based on the version releases and the impacts of upgrades. Software is only upgraded once all reasonable options are considered and deemed inadequate to meet current business needs. Reasons to upgrade include:

- Lack of vendor support;
- Costly vendor support;
- Lack of compatibility with versions used by business partners and customers;
- New features can be obtained which provide additional functionality to improve efficiency;
- Lack of compatibility with new software or hardware;
- Probability of failure/service interruption;
- Support costs (once systems are beyond warranty); or
- Challenges with interoperability and integration.

There is a direct benefit to our customers as the computer systems, such as the Customer Information (billing) System or Outage Management System, are used to process information necessary to provide the high level of service that our customers expect.

Facilities Remediation

PowerStream has four facilities with various age demographics. The Cityview Blvd head office in Vaughan is seven years old and in good condition while the Patterson Road north office and work yard facility in Barrie was built in the early nineties and is in fair condition. Lease hold improvements at Markham Addiscott Road Operations Centre facility will also result in increased capital requirement and the Jane Street in Vaughan office is new and does not require work.

The areas of concern for PowerStream's facilities are:

- Exterior (pavement, fencing, lighting, stores yard);
- Interior (furniture);
- Mechanical (Plumbing);
- Structural (windows, doors, wall partitions);
- HVAC (Heating & air conditioning); and
- Equipment (major tools, lifts).

Fleet Replacement

PowerStream's fleet assets are required to be in good working order. Depending on the class of vehicle (heavy duty, medium duty, light duty or miscellaneous class) replacement is required when the vehicle reaches:

- a prescribed odometer reading: or
- a prescribed Engine Hours reading and shows an upward trend in Unscheduled Maintenance cost for last three years, and
- a high projected unscheduled maintenance cost (based on a technical assessment).

Optimized, Prioritized Spending Procedures and Risk Management

PowerStream's Capital Investment Process commences with the annual business planning and budgeting process in the first quarter of each year, as described in Exhibit G, Tab 2, Section 5.3.1, page 25.

The following principles are applied on an annual basis to the process:

- Business Units develop their initial five year capital plans as part of the annual capital planning cycle;
- Business units prepare detailed budgets, justifications and business cases for projects, and enter these into the Optimization tool;
- A Corporate Five Year Plan is compiled based on the submitted business unit five proposed projects/programs as part of the capital planning cycle;
- The five year detailed budgets for all business units are prioritized through the Optimization process; and
- Approved and prioritized projects for years one and two are designed and readied for execution in the next business year(s). Approved and prioritized projects for the remaining three years are identified and design can be commenced only if warranted.

For the five year budget cycle, these principles are applied across ten key steps as shown in Figure 5. The detailed activities in each step are discussed in the following pages.

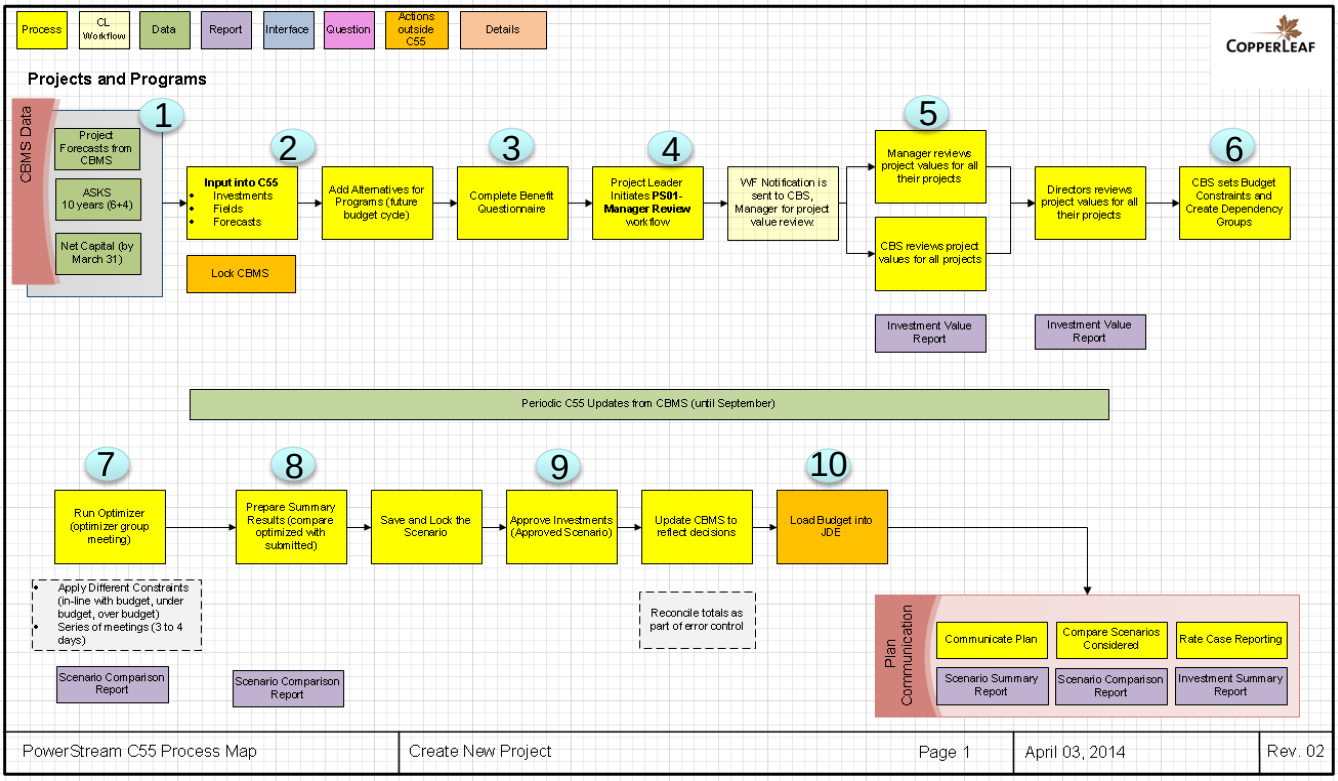

Figure 5: Capital Budget Cycle

Key Step One – Capital Budget Management System (CBMS) Entry

The Capital Budget Management System is one of the first tools applied in the budget cycle. PowerStream's Capital Investment Process incorporates a ten year forward looking plan. Business units that have major capital expenditures put together their own ten year departmental capital expenditure plans and five year budgets.

The business unit ten year capital expenditure plans are summarized into a Corporate Ten Year Capital Expenditure Plan. The information is combined from the following business units:

- Asset Investment Planning;
- Distribution Design;
- Operations;
- Lines;
- Supply Chain Services;

- Smart Grid & Metering; and
- Information Services.

Early in the calendar year a request is sent out by Asset Investment Planning to all business units in PowerStream to prepare ten year capital expenditure plans and five year budgets. These plans are developed over the January to March period. The information in the Corporate Ten Year Capital Expenditure Plan is used by the Finance Department in their financial models to consider affordability. In addition, information in the first five year plan is used in rate planning for the forward looking years.

In 2014, all project leads entered their project information (costs, year of expenditure, rationale etc.) into the Capital Budget Management System (CBMS) tool, which is then loaded into the Optimization tool for review and consolidation. In 2015, for efficiency gains, a project will be proposed to allow direct entry of the budget data into the optimization tool. Refer to Exhibit G, Tab 2, Section 5.2.3 page 7, for additional information.

These five year plans serve as the starting base for the development of the Corporate Capital Expenditure Plan.

The business unit capital plans serve three purposes:

i) assist business units in their future planning and enable the business units to provide solid five year budgets;
ii) forms the basis of the information provided in a rate application for the forward looking years; and
iii) provides the Finance team with information for financial planning.

Business units provide details in their five year budgets on forecast capital spending requirements and describe the process by which they have determined the capital spending requirements. Specific projects/programs and costs identified in the plans are generally preliminary and the projects/programs identified in the plans may or may not be approved for execution at this point.

Key Step Two – Input Data into Optimization Tool (Input into C55)

Data is entered into the Copperleaf C55 Optimization tool. Critical fields are entered including details on the proposed investment, forecasts of the expenditures over the five year budget horizon, answers to specific questions asked, based on the investment type, for both benefit and risk.

The value and risk questionnaire was created using vendor expertise, existing practices and the contribution of project leads as experts who request capital projects or programs.

Within Copperleaf's C55 program, all projects are valued (and optimized) based upon a Value Function. The Value Function is a weighting of a number of Value Measures. Value Measures can include risk mitigation, financial benefits, impacts on Key Performance Indicators (KPI), and cost. The Value Function was configured to reflect how projects contribute to PowerStream's strategic objectives as shown below. Questions were designed to provide value and scoring for these strategic elements, as noted in Exhibit G, Tab 2, Section 5.2.1, Figure 1.

Financial Benefits:

- Hard Financial Benefits
- Soft Financial Benefits

Productivity

KPI Impacts:

- Reliability
-
- Reliability for Spares
-
- Customer Communication

- Customer Service
-
- Rate Ready Organization
- Environmental Improvements
- Employee Wellness
- Technological Innovation

Risk Mitigation:

- IT Capacity
- Financial
- Environmental
- Safety
- Distribution
- Compliance

Cost:

- Project Cost

4 Pillars	Corporate Strategic Objective
Financial	F2 (provide an optimized rate of return)
Processes	I1 (focus on continuous improvement)

Customers	C1 (deliver professional services and exceptiopnal customer experience)
Customers	C1 (deliver professional services and exceptiopnal customer experience)
Customers	C3 (continue developing the PowerStream brand)
Customers	C1 (deliver professional services and exceptiopnal customer experience)
Processes	I4 (develop a rate submission ready organization)
Foundation	E2 (ensure a safe and healthy workplace)
Foundation	E1 (be a best in class employer)
Foundation	E4 (investigate and apply new and innovative technologies)

Foundation	E3 (build integrated technoogy platforms)
Financial	F2 (provide an optimaized rate of return)
Foundation	E1 (be a best in class employer)
Foundation	E2 (ensure a safe and healthy workplace)
Customers	C2 (provide customer swith cost effective, competive distribution rates)
Processes	I3 (Shape and Influence positive advocacy)

Financials	F1 (increase shareholder value)

Key Step Three – Complete Benefit Questionnaire

Once project identification is complete, the business units, in conjunction with the Capital Budget Supervisor, answer a series of questions about each project/program. The questions posed are aligned with PowerStream's corporate goals and risk matrix.

The answers to the questions form the basis for scoring both the value of the project to the corporation and its customers if the project is undertaken and the risk to the corporation and its customers if the project is not completed in the planned year. The Capital Budget Supervisor coordinates the business units across the organization to ensure that timelines are met, and consistent interpretations of the answers are applied.

In addition to answering the benefit and risk questions required for scoring the projects/programs, for those projects/programs that exceed the materiality threshold, additional questions with respect to Chapter 5 of this rate filing are posed and business leads are required to provide the requisite information. Business cases, as appropriate, are also created. Once the questions on the projects are all answered, the data on the projects is ready for optimization. PowerStream utilizes Copperleaf's C55 product for optimizing multi-year portfolios.

The current configuration of PowerStream's Value Function and the Value Measures that comprise the Value Function is summarized below:

- Each of the Value Measures is calibrated to the same scale (1 value point approximately equal to $1000). Consequently, within the Value Function, each of the Value Measures (except Project Cost) is weighed with the same value of +1. As Project Cost is a negative contributor to Project Value it is weighted with a cost of -1.
- All Value Measures are computed on an annual basis (e.g. the financial benefits for 2017 can be specified as being different than 2018). The stream of benefits (or costs) is converted to a single value for the Value Measure, by taking the Present Value of the stream, back to the beginning of the current fiscal year. The PV calculation uses the system defined discount rate.

- The Value of Risk Mitigation in all risk categories is computed using the same methodology. The project owner specifies the Baseline Risk and the risk present if the project is not completed.
- Residual Risk: The risk present if the project is completed. The value of Risk Mitigated is computed as: Baseline Risk – Residual Risk.
- For each risk the project owner specifies both the consequence and the probability of Consequence
- Projects in the following categories have been identified as Mandatory or Must Do investments as PowerStream is mandated to complete these investments, specifically:
    - Emergency Restoration;
    - Subdivision Services;
    - Road Authority Projects;
    - Emerging Development Capital;
    - Customer RGEN;
    - ICI projects;
    - Subdivisions;
    - Layouts; and
    - Emerging customers.

These projects are flagged as “must do” and are considered as mandatory as part of the optimization process. These projects have mitigated risk value as they are mitigating a compliance risk. These projects are subtracted, by the system, from the constraint amount, effectively reducing the amount of money available for competing projects and programs.

The value function combines all the value measures to compute the overall value of an investment. The value of an investment reflects the total value that the project is bringing to PowerStream, taking into account all of its financial benefits, impact on KPIs, risk mitigation and costs.

Key Step Four – Initiate Manager Review

Once a project lead has completed a project/program entry into C55, and automatic workflow notification is produced to advise the Manager, Director or VP and the Capital Budget Supervisor that the item is ready for review.

Key Step Five – Manager Review Projects/Program Values

Once a project/program, or series of projects/programs have been entered by project leads, their respective managers, directors or vice-presidents can review, on an individual or comparative basis, projects under their purview. Once reviewed and any follow-up questions answered, the projects/programs are then ready for the optimization process.

Key Step Six – Set Budget Constraint

The Finance department sets several budget funding level constraints to allow for analysis and to establish financial criteria to permit the optimization results to be compared to the optimal funding amount. These levels are available for optimization runs to create varied constraint scenarios.

Key Step Seven – Run the Optimization

The C55 tool is capable of running multiple scenarios with the project/program list being optimized for the greatest annual value. All capital projects/programs in the corporation are run through the Optimizer tool with projects from IT, fleet, planning, station construction and lines construction competing on value through the same tool. The multiple scenarios permit the results to be compared under various constraints and risks. The software tool takes all the projects/programs within the capital portfolio, calculates a numeric dollar value based on the benefit and risk calculations and the initial capital cost, and uses that value in the optimization process.

The C55 optimizer selects the combination of start dates of projects that brings the highest total value to PowerStream while fitting within the specified financial constraints.

Until projects are compared with one or another and the financial constraints are specified it is not known whether a project will be funded or not – so a project lead cannot know for certain whether or not a project will be funded.

Key Step Eight – Prepare the Results of the Various Scenarios

With the constraints set and the "must do" projects/programs accounted for, the results of the various scenarios are presented and reviewed by a multi-departmental senior optimization team, who discuss which projects must be approved as part of the five year capital budget. Members of the senior optimizer team include key leaders from each of the business units who have major capital spend across the corporation, as well as Rates & Regulatory department and Organizational Effectiveness department representatives.

Projects that were scored negative, are generally deferred beyond the six year horizon but are also discussed to ensure that any intangible benefits are considered. Once reviews and dependencies are considered, optimization can be run several times to achieve that optimal balance between the computation (science) and human element (art).

A decision is made on the preferred constraint scenario, and any project/program adjustments and deliberations occur prior to finalizing the preferred listing.

Key Step Nine - Determining and Approving the Portfolio of Projects/Programs

The result from the senior optimization team is a proposed scenario of multi-year projects and programs that will be approved by the PowerStream's Executive Management Team (EMT) and the Audit and Finance Committee for approval prior to approval by the Board of Directors.

The proposed scenario is submitted for approval with the appropriate business case details. For projects less than $500,000 the information is in its "mini-business case" format for each project. For any specific project or program that is greater than $500,000 or for IT related projects greater than $100,000, a full business case is provided and submitted for approval.

In conjunction with this process, for a rate filing year, the DS Plan's Customer Engagement process, as detailed in Exhibit G, Tab 2, Section 5.4.2, considers the responses of PowerStream's customers and a detailed review is held to correlate the proposed plan to the engagement results.

Key Step Ten – Load the Approved Portfolio into JD Edwards

The approved first year portfolio of projects/programs is loaded into the JD Edwards financial system so that it is available for all departments use within the project execution process, enabling project/program implementation.

Maintenance Planning Criteria and Assumptions

PowerStream has two main capital activities related to maintenance, which are planned and unplanned maintenance.

Planned (Proactive) Inspection and Maintenance

Activities associated with PowerStream's annual distribution inspection and preventative maintenance program are detailed in Table 2. When an inspection is performed on a given set of assets, a rating code is assigned. If the rating code assigned warrants immediate replacement, the replacement cost will generally be capitalized, while repairs will generally be expensed.

Figure 5-18, Graph Showing WPA History Over 5-Year Period

5.3 Asset Management Process

This section describes HOBNI's Asset Management Process. An overview, including descriptions of inputs and components of the process is given. HOBNI's distribution service area, system configuration, and asset profile are described. Additionally, HOBNI's lifecycle procedures and practices are presented.

5.3.1 Asset Management Process Overview

HOBNI's asset management process is the foundation of the DSP. It is built on the strategy of centralizing key decision making in order to maximize the long-term effectiveness of investments while maintaining performance levels. The objective of the asset management process is to develop an investment portfolio that allows HOBNI to maintain its assets in a manner that results in the lowest long-term cost of ownership while adhering to:

Electrical system design requirements and standards;

- Accepted construction codes and standards;
- Prescribed asset and manufacturing specifications.

An overview of HOBNI's AMP elements is followed by procedures and steps, as shown in Figure 5-19.

- **Asset Management:** The process of identifying needs is based on multiple inputs, determining the appropriate technical alternatives, developing business cases to address those needs, and developing categorized investment portfolios;
- **Investment Optimization:** Corporate considerations are made when assessing any proposed investments for an optimized business plan, and also include rate and customer impact assessment;
- **Work Execution:** Involves executing planned projects and programs according to the business plan;
- **Continuous Improvement:** Includes monitoring and controlling work execution, documenting and assessing performance versus baseline, and developing actions to improve work execution, investment prioritization, as well as corporate philosophies and business goals.

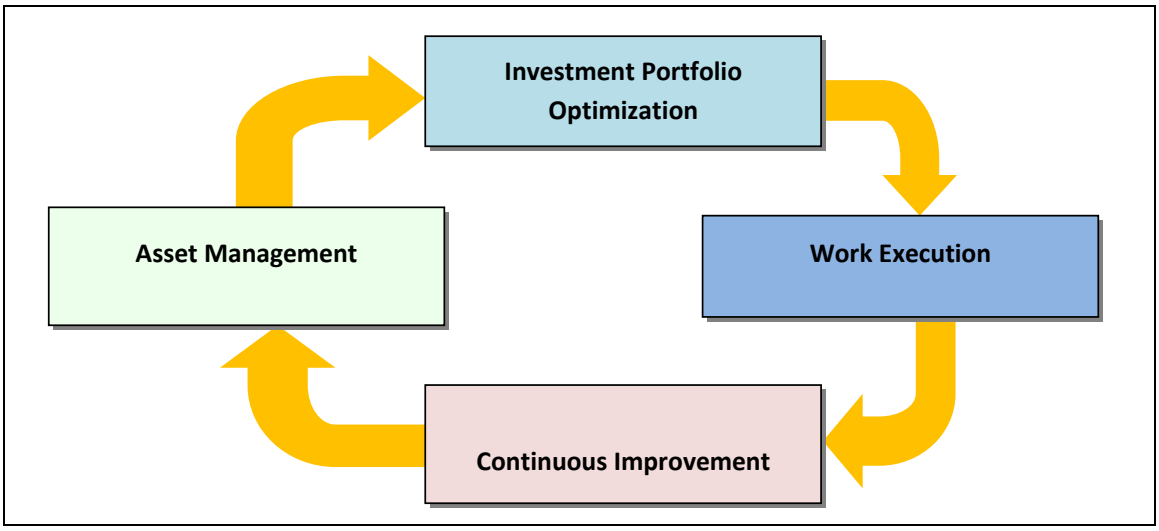

Figure 5-19, HOBNI High Level Asset Management Process Overview

A detailed AMP flowchart provided in Figure 5-20 shows the tasks and procedures under each major category. These are described in the pages that follow.

HOB Asset Management Process

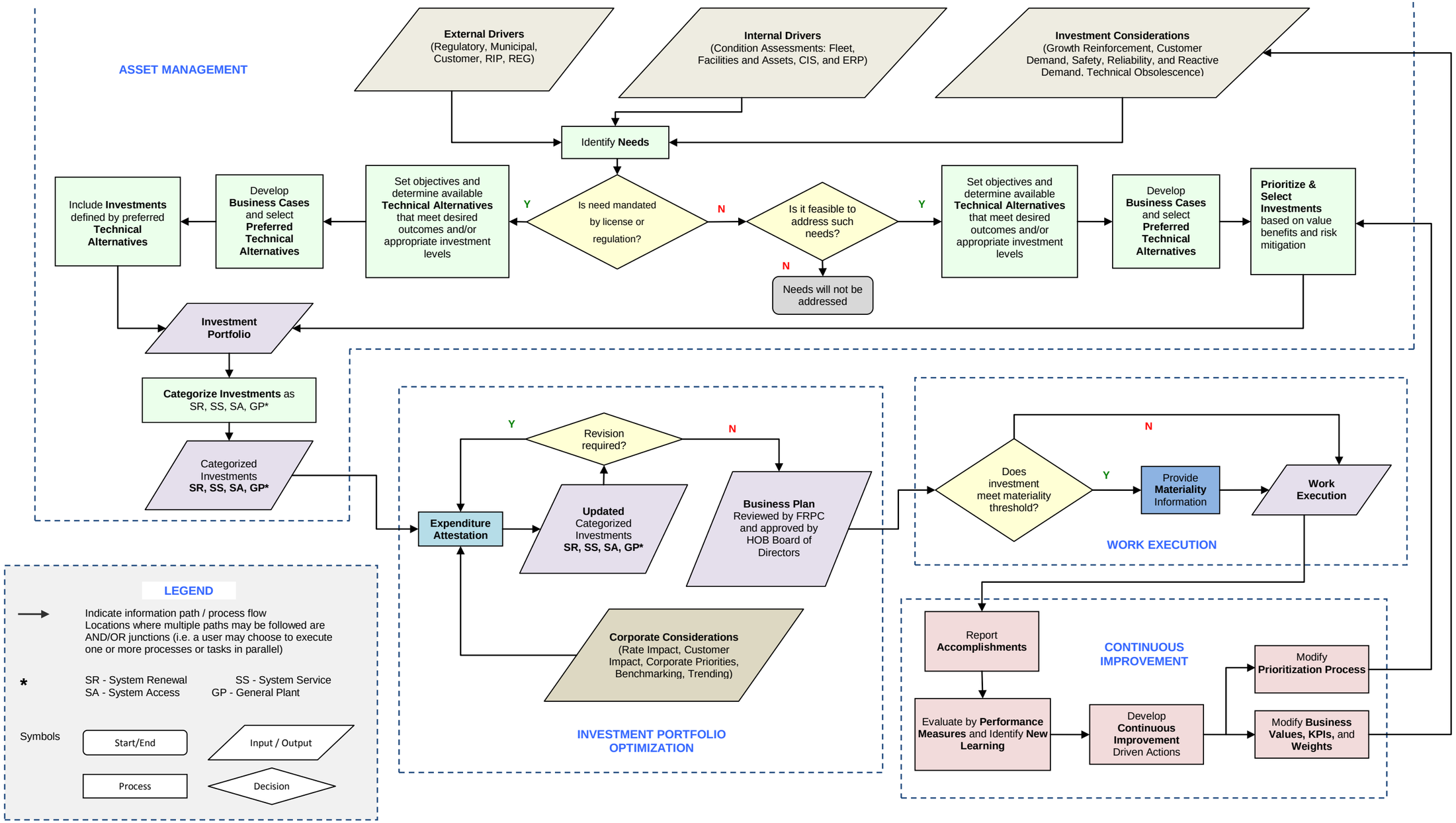

Figure 5-20, Asset Management Process Flow Showing Tasks & Procedure

5.3.1.1 Asset Management Process (Detailed Explanation)

Specific tasks and procedures under the Asset Management category are described below.

Identification of Needs

Needs are identified through to HOBNI's external drivers, internal drivers, and investment considerations.

- **External Drivers**: These drivers are initiated outside of HOBNI. Examples include:
    - Regulatory Requirements: Codes, design standards, DSC requirements;
    - Municipal Initiatives: Street lighting, road widening, new subdivisions;
    - Customer: Industrial customer demand increase;
    - IRRP/RIP: New supply feeders, and load transfers; and
    - REG: New connections.
- **Internal Drivers**: These drivers typically result from studies conducted internally by HOBNI. These studies are described in detail in Section 5.3.1.5, and include:
    - 2013 Asset Condition Assessment (ACA);
    - 2013 City of Brampton Growth Forecast;
    - 2013 System Capacity Study;
    - 2013 Fleet Assessment;
    - 2013 IT Roadmap;
    - 2010 Facilities Condition Assessment;
    - HOBNI 2014-2019 Business Plan;
    - Customer Satisfaction Survey;
    - Equipment Failure Analysis and Forecast Trend; and

- Ten Best and Ten Worst Performing Feeders.

- **Investment Considerations**: The considerations used to identify needs include:
  - Growth: Constructing new infrastructure required to support service capacity in response to load growth;
  - Reinforcement: Upgrading the existing infrastructure to support existing service capacity in response to surrounding load growth, or REG activity;
  - Customer Demand: Responding to requests by authorities with jurisdiction over the location or relocation of existing infrastructure;
  - Safety: Constructing infrastructure required to eliminate unsafe conditions;
  - Reliability: Constructing infrastructure to sustain system reliability, and reduce outage duration;
  - Reactive Demand: Responding to failed equipment that contributes to an outage or potential outage, or equipment no longer fit for duty or not in safe condition; and
  - Technical Obsolescence: Replacing obsolete critical equipment when vendor support is no longer available.

Needs may be further classified as either mandated, or non-mandated. The work to address mandated needs must be undertaken by HOBNI in order to meet regulatory, legal, conditions of license, conditions of service, and environmental or safety requirements. Although non-mandated initiatives may or may not be required, HOBNI may decide whether the need should be addressed immediately, in the future, or not at all.

Technical Alternatives

Once a need is identified, the criteria for success in addressing the need must be established. The focus then turns to identifying actions, technical alternative or project options that meet the success criteria. Technical alternatives that support HOBNI's principles and business goals are then selected.

The input and considerations used to define and select a technical alternative include studies (e.g., asset condition assessment, capacity, and growth), impacts to safety, reliability, customer service, costs, and impact on HOBNI resources (e.g., staff, materials, outage availability).

The level of investment associated with a possible technical alternative is also considered, such that different levels of investment will mitigate different levels of risk. The minimum level of investment dictates the scope that will mitigate unacceptable risk. Additional levels of funding allow for greater scopes of work, and would result in higher levels of risk mitigation.

Not all technical alternatives are selected for project execution. Those that remain are added to a Capital Project Register (CPR), for future evaluation. The CPR acts as a clearing house for potential project alternatives that will be evaluated in future budget reviews. The alternatives remain in the CPR until such time as the alternative is selected for execution, or declared no longer suitable and removed. The CPR includes information detailing specific project parameters, such as new system feeder additions, customers affected, and existing feeders impacted by the technical alternative. This facilitates improved identification of project scheduling and outage coordination, providing relevant information for the project evaluation process.

Business Cases

Once an appropriate technical alternative is selected, a business case is developed to support the alternative. The business case outlines and justifies the investment, scope and expected outcome or results, and addresses the cost and timing, customer benefits, and alternatives considered.

HOBNI's business values (BV) play an important role in developing a business case by reflecting the qualities and characteristics that help to define the organization, and which form part of the criteria for developing investments, managing risk, and choosing the best level of investment to meet business and customer requirements. HOBNI's business values are reflected in decision-making for achieving strategic goals and objectives, and are measured by key performance indicators (KPIs).

Key performance indicators measure the impact on HOBNI's business values when prioritizing investments and form the basis for multi-criteria analysis, and assessing the level of risk and risk mitigation of proposed investments against each BV. The process incorporates a probability and severity-of-outcome risk matrix to determine the impact

ratings for each BV. The probability scale ranges from remote to very likely, and the severity-of-outcome scale ranges from minor to catastrophic.

Business cases evaluate the possible risk to corporate business values, should the project not be executed. The preferred alternative is selected based upon achieving the highest level of overall risk mitigation with respect to HOBNI's business values.

Investment Prioritization & Selection

Once the business cases for technical alternatives are developed, the priority of each case is then determined.

Mandated investments are prioritized based on deadlines, resource availability, and clarity of scope. Non-mandated investments are prioritized according to a needs-based framework and criteria used to consider project benefits and risk.

The first step of the prioritization process is evaluating the project benefits. There are five criteria, as shown in Table 5-7. Each criterion is assigned a weight, where a higher weight determines a higher level of importance for a particular criterion. A project benefit with respect to a criterion is evaluated and given a score between 1 (low) and 5 (high), inclusive. A project's overall benefit score is calculated using the sum-product of all weights and scores.

Table 5-7, Estimation of Project Benefits

	Benefit Criteria	Description of Benefit	Weight	Score
1	Economic benefit	Does this work increase shareholder value and provide consumers a reliable supply at reasonable cost?	30	1 to 5
2	System capacity to service new connections	Does this work provide system capacity without compromising service to existing customers?	15	1 to 5
3	Maintain and sustain system performance	Does this work maintain or improve upon the system reliability?	20	1 to 5
4	Paced and predictive asset rehabilitation and replacement	Does this work provide a replacement of assets in paced spend mode before asset failure and future increased replacement cost?	30	1 to 5
5	Operational system agility	Does this work permit or improve upon the ability to balance load through transfers and ties?	5	1 to 5

After evaluating the benefits according to the needs-based framework, projects are then examined from a risk perspective. There are six risk criteria, as shown in Table 5-8. Each criterion is assigned a weight, where a higher weight determines a higher level of importance for a particular criterion. A project risk with respect to a criterion is evaluated

and given a score between 1 (low) and 6 (high), inclusive. A project's overall risk score is calculated using the sum-product of weights and scores.

Table 5-8, Estimation of Project Risk

	Risk Criteria	Description of Risk	Weight	Score
1	Safety and Environmental risk	Does this work mitigate exposure to events that would be detrimental to public and/or employee safety and/or environmental risks and liabilities?	30	1 to 5
2	Financial	Does this work mitigate the negative impact on HOBNI's net income?	25	1 to 5
3	Customer Reliability	Does this work mitigate events negatively impacting reliability, OEB service quality indices and customer satisfaction?	15	1 to 5
4	Regulatory Relationship	Does this work mitigate events that would negatively impact HOBNI's credibility and relationship with regulators and authorities with respect to compliance with codes and standards, directives and laws for future work?	10	1 to 5
5	Business Efficiency	Does this work mitigate events that would potentially limit the competencies of HOBNI's staff? Does this work mitigate any risks affecting the completion of work program achievement?	10	1 to 5
6	Reputation	Trust and credibility are the foundational building blocks to ensure that customers have their rational and emotional requirements met. Does this work have the potential to improve HOBNI's image, trust and credibility with customers, the public, and industry?	10	1 to 5

Projects that provide the greatest benefit and highest level of risk mitigation will receive preference and higher ranking.

HOBNI's investment portfolio is developed from the prioritized projects and investments.

Investment Categorization

HOBNI's overall investment portfolio is developed from its portfolio of mandate and non-mandated investments. Investments are then assigned to one of four possible categories.

- **System Access**: These investments are expansions (including asset relocation) made to the distribution system by the distributor to provide a customer (including a generator customer) or group of customers with access to electricity services from the distribution system;
- **System Service**: These investments are modifications made to a distribution system by the distributor so that the distribution system can continue meeting its operational objectives, while addressing anticipated future customer electricity service requirements;

- **System Renewal:** These investments involve replacing and/or refurbishing system assets to extend the original asset service life, thereby maintaining the distribution system's ability to provide customers with electricity service;

- **General Plant:** These investments are modifications, replacements or additions to a distributor's assets which are not part of its distribution system, including land and buildings, tools and equipment, rolling stock, and electronic devices and software used to support day-to-day business and operations activities.

5.3.1.2 Investment Portfolio Optimization

Specific tasks and procedures under the Investment Portfolio Optimization category are described below.

Expenditure Attestation

The needs, objectives, achievements, costs, and risk assessment for each investment are documented according to HOBNI's Asset Management Process.

Under the Expenditure Attestation process, this information is reviewed and assessed by HOBNI senior management. This quality control review ensures the full integration of many investments, and the uniformity of risk assessment.

HOBNI's senior management employs an iterative process for selecting investments to be included in the business plan, where the impact on rates, customers and corporate priorities is considered. Benchmarking and historical trends are also taken into account. This may result in revised levels of investment for individual projects and/or programs within the established overall budgetary envelope.

The aggregation of selected investments comprises the preliminary business plan, which balances needs with constraints, and focuses on achieving HOBNI's business objectives according to its business values. The business plan is reviewed by the Financial, Regulatory and Policy Committee (FRPC), and approved by HOBNI's Board of directors.

It is important to recognize that although the business plan is developed following extensive planning and analysis, its implementation must be dynamic and flexible. Redirection of approved investments that may be required for many reasons can include changing customer needs, changing asset priorities based upon new information, changing external requirements, and major events (e.g., extensive storms and

equipment failures). For these reasons, the business plan's implementation throughout the year may differ from the original plan as new risks or opportunities emerge, and when changes in conditions and shifts in priorities arise.

This redirection of work enables appropriate adjustments to be made for work originally identified in the business plan. For example, emergency restoration work required to repair failed equipment or distribution lines damaged by storms can be significant in a given year, and may require the redirection of funds and field resources from other investment areas to correct such significant and unexpected damage.

5.3.1.3 Work Execution

The work execution process involves the completion of approved projects and/or programs according to the business plan. Prior to commencing work, investments must be identified that meet the materiality threshold of $350,000. Such investments require an additional level of scrutiny, which is described below.

Providing Materiality Information

The types of information provided for every material investment include general information, evaluation criteria and information requirements, and other category-specific requirements for investments classified as System Access, System Renewal, System Service, and General Plant.

5.3.1.4 Continuous Improvement

Specific tasks and procedures under the Continuous Improvement category are described below.

Reporting Achievements

Each month, management monitors year-to-date expenditures and achievements, and projected year-end expenditures. Deviations from plans are identified, and corrective action is taken. If project spending is expected to be materially different from the originally approved amount, a variance review is undertaken. Projects that cannot be re-justified are either scaled back, cancelled or otherwise adjusted to conform to the new circumstances. Program variances are reviewed on a monthly basis by HOBNI senior

management, and any resulting redirection of resources is approved at the senior management level.

Evaluating Performance Measures & Determining Lessons Learned.

- HOBNI records, monitors and tracks various performance metrics. Performance measures are described in detail in section 5.2.3.

Continuous Improvement & Modification of Prioritization Process, BVs & KPIs

HOBNI utilizes a dynamic process implemented so that improvements or modifications to the entire process or only certain components can be made.

Such changes may result from lessons learned determined from recently completed projects, and may become the basis for future modifications of internal and external business drivers, and shifting priorities.

Examples of events that may trigger the need to refine HOBNI's existing process are listed below:

- Organizational changes (new Board of Directors);
- Mergers and acquisitions involving other LDCs;
- Major municipal projects or provincial projects;
- Economic downturn (local or widespread);
- Changing regulatory requirements (e.g., standards, DSC, REG incorporation);
- Force Majeure events (e.g., tornado, flooding, wide spread fire); and
- Not meeting established goals and targets.

These changes may affect HOBNI's vision, mission, and associated corporate and business values, and the process of prioritizing and selecting investments.

5.3.1.5 Supporting Inputs & Studies

Information presented in the following studies, documents and condition assessments were used as the primary means of identifying of needs for preparation of the final capital expenditure plan.

2.1.2. Asset Management Implementation and Components (5.3.1.b)

Horizon Utilities' capital investment planning is achieved through the implementation of the AM Framework described above. The AM model ("AM Model"), illustrated in Figure 13 below, seeks to promote ongoing improvements involving each of the five core functions identified in the AM Framework. These activities encompass all aspects of managing the distribution system assets ranging from identifying long term system capacity requirements to determining needs of aging infrastructure based on the asset condition assessments to optimizing real time operational performance of the distribution system. The activities contained within each of the boxes in Figure 13 below create the inputs to the next step of the process, while the arrows within the diagram identify the process flow.

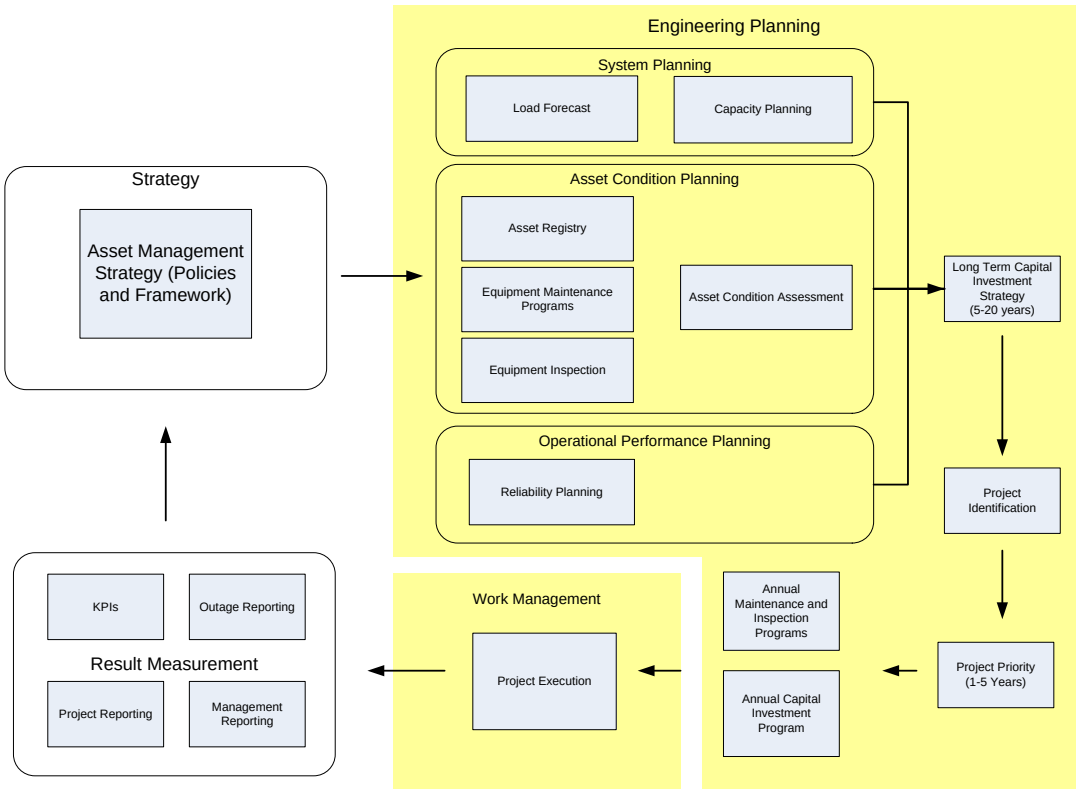

Figure 13 - Asset Management Model

Asset Strategy

Horizon Utilities identified the risk presented by its aging distribution infrastructure in both the Hamilton and St. Catharines service territories and moved to create and implement its AM Framework to address the risk of erosion of service to levels unacceptable to Horizon Utilities' customers. The fundamental principle of AM focuses on identification and justification for

investment decisions related to the long term stewardship of the assets to provide an acceptable level of customer service and reliability consistent with customers' expectations at the lowest total life cycle cost possible.

The AM Framework balances short term operational needs with investments required for the long term sustainability of the distribution system. The framework enables long term system planning, identification of investment requirements and measurement of performance outcomes.

Asset Registry and Records Management

A thorough and unbiased assessment of asset condition is an essential component of effective asset management. All renewal decisions should be based on accurate and predictive assessments utilizing such data.

Horizon Utilities has centralized the distribution assets into a single asset registry contained in the Geospatial Information System ("GIS"). The GIS presents Horizon Utilities' distribution assets in graphical form with the asset attributes (such as - age, manufacturer, size/length, and installation date) with electrical connectivity. Horizon Utilities has collected records and inspection data to create an inventory of condition data for individual equipment. Horizon Utilities is in the process of renewing the GIS system and once complete, the maintenance and inspection data will be consolidated into the new GIS. The asset attributes as well as inspection and maintenance information are vital inputs into the asset condition assessment process.

The inventory and record of General Plant assets are managed outside of the GIS system within the business units that are responsible for the assets. This record system supports a parallel process to that performed on all other assets; with the exception of the use of the GIS system.

Planning and Project Selection

Engineering planning activities provide the foundational information and data upon which investment strategy is determined. The investment strategy, in combination with a project prioritization framework (described in the Project Identification and Selection segment below), ultimately produces the annual capital investment program and annual maintenance and inspection programs.

AM provides the foundation upon which the long term distribution capital investment strategy and annual capital investment programs can be developed and/or updated. The principal annual deliverables of the AM process include: review of the long term capital investment

strategy; updating the AM inputs; development of the annual distribution capital investment program; and creation of the annual maintenance and inspection programs.

The planning activities of the AM Model include three major considerations:

- System Planning;
- Asset Condition Assessments; and
- Operational Performance Planning.

Horizon Utilities addresses asset capacity utilization through its System Planning and ACA analysis. Furthermore, the components related to equipment failure, worst performing feeders, and risk/consequence failure analysis are all addressed through the Operational Performance Planning process.

System Planning

Capacity and security planning play important roles in the way the distribution system and asset components are managed. The primary function of capacity planning is to ensure reliability of service for all existing customers as well as planning for future growth with the addition of new customers. Security planning focuses on the development of contingency plans to be used if a major asset should fail; thus allowing affected customers to be supplied from alternate power supplies. Ultimately, the final objective is to have adequate capacity and security for the entire distribution system in order to deliver a safe and reliable supply of electricity.

Long term system planning may include the coordination with third parties. This is further described in section 1.2.2 above.

Horizon Utilities' System Load Report

The System Load Report identifies electrical consumption by voltage level, service territory, Horizon Utilities-owned municipal substations, and Hydro One-owned transformer stations (at the TS bus and feeder level).

Long Term Load Forecast Report

The Long Term Load Forecast Report (found in Appendix H to this DSP) provides capacity analysis at all voltage levels of the distribution system. This analysis is performed at a station and feeder level. Feeders with peak loading exceeding 85% of capacity are identified so that new loads planned for these feeders can be analyzed. If the need for expansion or enhancement is identified, potential solutions and alternatives are reviewed in the annual planning cycle. The time period utilized for transformer station forecasts and feeder forecasts is twenty-five years.

Asset Condition Assessment

Distribution Assets

This ACA report summarizes the methodology used, outlines specific approaches used in the projects, and presents the resulting findings and recommendations.

For ease of reference, the Kinectrics ACA methodology, a summary of the data assessment criteria and the results of the ACA are summarized below:

Asset Condition Assessment Methodology

The Kinectrics ACA methodology involves the process of determining an asset Health Index, as well as developing a condition-based Flagged-For-Action Plan for each asset category. This data is then used to determine the appropriate course of action for assets in “very poor” or “poor” condition while also taking into account the criticality of the major assets, such as station transformers.

Health Index

Health Indexing quantifies equipment condition based on numerous condition parameters that are related to the long-term degradation factors that cumulatively lead to the end of life for a particular asset group. The Health Index is an indicator of the overall health of the assets and is typically given in terms of percentage, with 100% representing an asset in brand new condition.

The Health Index distribution given for each asset group illustrates the overall condition of the asset group. Further, the results are aggregated into five categories and the categorized distribution for each asset group is given.

The Health Index categories are as follows:

Very Poor	Health Index < 25%
Poor	25 <= Health Index < 50%
Fair	50 <= Health Index <70%
Good	70 <= Health Index <85%
Very Good	Health Index >= 85%

For critical asset groups, such as Station Transformers, the Health Index of each individual unit is given. For assets groups with a high volume of assets, the Health Index distribution deals with percentages of the total population.

Condition-based Flagged-For-Action Plan

Once the Health Index values were calculated, a Flagged-For-Action Plan based on asset condition was developed. The condition-based Flagged-For-Action Plan outlines the number of units that are expected to be replaced in the next twenty years.

The Kinectrics' models provide for two methods of calculating the Flagged-For-Action Plan volumes: i) reactive calculation; and ii) proactive calculation.

For assets with a relatively small consequence of failure, units are generally replaced ***reactively*** upon failure. The Flagged-For-Action Plan for such an approach is based on the asset group failure rate. This approach incorporates the possibility that assets may fail prematurely and prior to their expected typical end of lives.

For critical assets, a ***proactive*** approach is utilized such that units are replaced prior to failure. For asset groups that fall under this approach, a risk assessment study is conducted to determine the units eligible for replacement. This process establishes a relationship between the asset Health Index and the corresponding probability of failure for each individual asset within the asset group. The quantification of asset criticality was also involved through the assignment of weights and scores to factors that impact a decision for replacement. The combination of criticality and probability of failure determines risk and replacement priority for that unit. This approach was utilized for the substation transformers, switchgear, and circuit breaker asset groups.

ACA Conclusions and Recommendations

The Kinectrics ACA was conducted on 22 asset groups that were consolidated into fifteen asset categories. For each asset category, the Health Index distribution was determined and a condition-based Flagged-For-Action Plan was developed.

The results of the Kinectrics ACA are provided in Section 2.2.3.

Operational Performance Planning

The third major input into the planning process is Operational Performance Planning which relies on system reliability and equipment failure statistics to assess the operational performance of the distribution system.

SAIDI is used to measure the average annual hours of interruption experienced by all customers. Reliability reports provide for a very granular level of detail into system performance by classifying outages by cause, voltage, area and impact (number of customers and duration) and are used to identify areas requiring investment.

Additionally, outages caused by equipment failure are further investigated to determine the cause of the failure ("Failure Analysis"). Specifically, Horizon Utilities analyzes the performance of its worst feeders to ensure overall compliance and best practices in Asset Management. The Failure Analysis information is collated and analyzed in an attempt to improve equipment failure prediction and identify either geographical areas or asset groups requiring investment.

Collectively, SAIDI, reliability reports, and the Failure Analysis allow Horizon Utilities to identify and quantify the performance of various components. This analysis provides a measure of the risk or consequence of failure of an asset group. The analysis also includes a geographic analysis of system interruptions providing the identification of the worst performing feeders or areas of the service territory. All of this analysis provides Horizon Utilities with quantitative measures regarding distribution system performance and impacts on service which is used as a significant input into the capital investment planning process.

Ultimately, the entire AM planning process combines the output of the ACAs with the system performance, measured through system reliability, with capacity requirements to determine the areas, or projects, which require capital investment.

Candidate projects, identified through the system planning, asset condition assessment, and operational performance planning sections above, are then prioritized for inclusion in the annual capital investment programs. The prioritization process components are detailed immediately below with further and more detailed explanation in Section 3.2.3.

Project Identification and Selection

The output of the system, asset condition, and operational performance planning activities identified above are used in the development of long term capital investment strategy and subsequent project identification and prioritization. The steps, illustrated in the AM Model in Figure 13 above, are detailed below.

Long Term Capital Investment Strategy

System Renewal investment is primarily capital with a long term planning horizon. The output from the Long Term Capital Investment Strategy is provided below in Section 3.1.3.

The ACA performed by Kinectrics was the primary input and driver of the long term capital investment strategy ("LT Capital Strategy"). As previously discussed in Section 2.1.2, the Flagged-for-Action Plan identifies the number of units that are expected to be replaced in the next twenty years and provides a recommended renewal investment profile. This recommended profile is used to guide the twenty year capital investment requirements.

The Health Index distribution results identify the long term (20 year) investment requirements for the asset groups This information is used to identify long term capital investment programs which provide the overarching design for multi-year programs. The individual projects underlying the LT Capital Strategy are identified in the Project Identification step detailed below.

Kinectrics recommended a total twenty year investment level of approximately $693,000,000, detailed in Section 3.1.2 below, which warranted further validation given the materiality of the investment and related implications for long-term sustainable customer service reliability. Consequently, Horizon Utilities retained KPMG to conduct an independent assurance review and provide an opinion on Kinectrics' methodology and the resultant findings and recommendations contained in Kinectrics' report.

KPMG reviewed the methodology published by Kinectrics in its report and compared it with other methodologies used by utilities in order to test the validity of the selected methodology used by Kinectrics. The KPMG Report stated:

> *"Based on an independent assurance review of the methodology and analytics used in the Kinectrics report, it is KPMG's opinion that the approach used to arrive at the presented results is in line with industry practice and generally accepted methodologies. KPMG is of the opinion that the presented methodology has been appropriately and consistently applied against the Horizon supplied asset data in order to derive the final Flagged-for-Action plans for each of the asset classes. The interim and final results as presented in the Kinectrics report have been independently validated by KPMG to an acceptable margin of error for the intended purpose of projecting asset replacements or refurbishments over a twenty year period. When compared with accepted industry standards and practices for useful asset life, Kinectrics Flagged-for-Action plans appear to be reasonable and in line with industry expectations."*[5]

The KPMG Assurance Review of Kinectrics' ACA Report dated January 23, 2014 is provided as Appendix C to this DSP.

Project Identification

The long term needs identified by the LT Capital Strategy and short term needs identified through the planning processes are input into the Project Identification step. The LT Capital Strategy described above establishes a number of long-term, multi-year programs. Execution of these programs requires annual projects, completed sequentially, throughout the life of the program. Additional projects are identified through short term needs identified either from external parties, or from operational requirements of the distribution system.

The scope, justification and high level estimates are created for all candidate projects identified above and are submitted for project prioritization for scoring to determine the overall project effectiveness, value, and timing.

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[5] KPMG Report page 18[6] *The Conference Board of Canada, Adapting to Climate Change: Is Canada Ready*, March 2006 at page 8.

Project Prioritization

Candidate projects identified as a result of the Project Identification process are prioritized based on risk mitigation, asset renewal and other benefits.

Horizon Utilities prioritizes projects/activities to ensure that the most cost effective and necessary projects are executed first. Horizon Utilities' prioritization methodology assesses the effectiveness of projects based on their impact on the five defined categories with relative weights reflecting importance of each category. The highest scoring projects are given the highest priority. Necessity is determined by category and level of overall impact of a delay in action.

Proposed capital projects are ranked on the basis of a composite project priority score comprised of scores from each of the following categories:

1. Safety;
2. Security;
3. Customer Impact;
4. Regulatory/Statutory; and
5. Environmental.

The complete prioritization methodology is provided in Section 2.3.1 below.

General Plant Assets

Building Assets

Horizon Utilities has four main properties and 28 substations built between 1914 and the early 1980's within the cities of Hamilton and St. Catharines. In order to ensure capital investment in buildings is prudent and guided by proper AM principles, Horizon Utilities performed the following asset condition studies:

- Resource and Office Space Utilization Study Report ("Space Study") by PRISM Partners Inc provided in Appendix J;

- Building Condition Assessment 2013 (“BCA”) by Evans Consulting Services, provided in Appendix K;
- Horizon Utilities Physical Security Report by CAPSYS Integrated Technology Consultants provided in Appendix L;
- Horizon Utilities Head Office Window Assessment by MMM Group Limited provided in Appendix M; and
- Roof Inspection Review Fall 2013 for the John Street Head Office by Garland Canada Inc. provided in Appendix N.

The information collected during the asset condition studies provided Horizon Utilities with enhanced asset condition data and a refreshed view of long term capital expenditure requirements. This further informs the facilities planning process (“Facilities Planning”) undertaken by Horizon Utilities in the pursuit of efficient asset management. Figure 14 below demonstrates Horizon Utilities’ Asset Management decision tree that is used for Facilities Planning. This map is used in conjunction with objectives, goals and frameworks previously established through the DSP to ensure the most efficient management of building assets as well as ensuring effective capital expenditure planning. Through this process, Horizon Utilities strictly regulates its expenditure on these assets to adhere to priorities previously established in Section 2.1.1 above, while preventing undue degradation of building assets and negative consequence to operations and corporate functions.

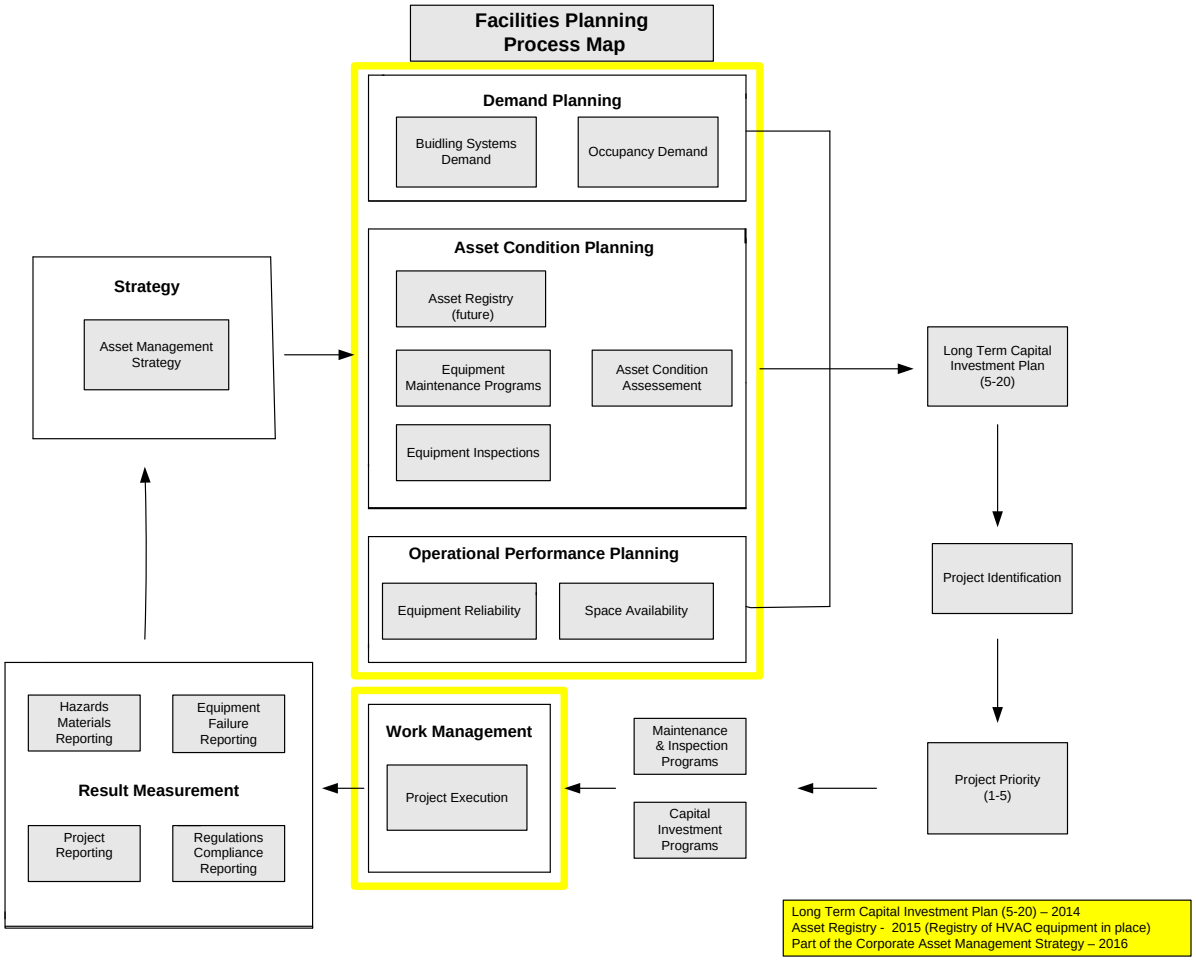

Figure 14 – Facility Planning Process Map

The following segments address the components of the Asset Management process as they relate to Facilities Planning identified above.

Asset Strategy

Horizon Utilities has identified the need for additional office space; the existence of poor work environments; and safety risks presented by aging building infrastructure and equipment. Horizon Utilities initiated a series of building asset condition studies, listed above, to identify the related investment needs. The findings from the asset condition studies are provided in Section 2.2.4.

Asset Registry

A thorough and detailed assessment of asset condition is an essential component of effective asset management. Repairs and renewal decisions should be based on accurate and predictive assessments utilizing such data. Horizon Utilities has created an inventory list of nearly all Heating, Ventilation and Air Conditioning ("HVAC") equipment and components. Horizon Utilities will complete a full inventory of all building related equipment and systems in 2014 and 2015. The facilities inventory of facilities related assets will be recorded in Horizon Utilities' Enterprise Resource Planning ("ERP") system. The findings and recommendations from the BCA will also be incorporated into the development of the facilities asset registry.

Planning and Project Selection

The buildings asset planning process provides the foundation for the long term capital investments required. Collectively, the Space Study, the BCA, and annual equipment maintenance and inspection programs determined the project prioritization.

The buildings renovation schedules from 2012 to 2019 were developed using: the recommendations from the Space Study; future departmental long term operational requirements; and user input. Each year, the planned renovation projects are reviewed and, if necessary, modified to reflect any changes to the operational requirements.

The planning activities of the Asset Management Model include the following major considerations:

- Building System Demand;
- Building Occupancy Demand;
- Increase in Employee Headcount and Office Equipment;
- Building Equipment & Systems Failure Reporting;
- Third party Asset Condition Assessments; and
- Operational Performance Planning.

Building Equipment & Occupancy Demand

Building equipment and office space capacity, availability, reliability, systems consumption and sustainability planning play important roles in the way those asset components are managed. The primary function of equipment and system demand planning is to ensure the adequate

capacity and reliability of all building related equipment and systems, such as HVAC Units, building fire systems and building security systems, so as to maintain an acceptable work environment for Horizon Utilities employees while planning for future growth.

Building Asset Condition Assessment

The Space Study and BCA were primarily used to support the evaluation of the future buildings needs for Horizon Utilities.

The Spacy Study and BCA were conducted on the following categories of facilities:

- Office Space Environmental Conditions & Requirements
- Heating and Air Ventilation Conditions
- Interior and Exterior Architectural Conditions
- Building Code and Fire Act Compliance
- Building Regulation Requirements
- Early detection of possible failure to prevent deterioration and damage of existing and neighboring components or systems
- Forecast replacement costs for major components

Asset Condition Assessment Methodology

The objective of the BCA was to determine the condition of existing equipment, systems and infrastructure, and provide recommendations for improvement and forecast replacement costs for major building components based on their predictable life. The Life Cycle Analysis ("LCA") used is based on the premise that every component has a predictable life. Several organizations such Buildings Owners and Managers Association ("BOMA") and International Facility Management Association ("IFMA") publish lifecycle charts that forecast the expected service life of building components given their past performance. Building components include items such as roofing, architectural interior and exterior elements, heating ventilation and air conditioning components and so on.

Another driver that impacts the life of a building component is the effectiveness of the preventative maintenance program being applied. For purposes of the BCA, the consultants defined Preventative Maintenance ("PM") Program as planned actions undertaken to retain an item at a specified level of performance by providing repetitive scheduled tasks which prolong system operation and useful life and prevent premature failures. Typically PM Programs include inspection, lubrication, adjustment, cleaning, non-destructive testing, and periodic maintenance, usually including minor component replacement.

The balance of any successful PM Program is deciding the extent of maintenance that needs to be applied. Over maintaining a building is too expensive, while under maintaining can be catastrophic. The measure of the buildings' condition through a BCA is one way to measure the effectiveness of current maintenance programs and inform future maintenance requirements.. Maintenance programs are discussed further in Section 2.3.1.

Operational Performance Planning

One of the major inputs into the planning process is Operational Performance Planning which relies on system reliability, availability and equipment failure statistics to assess the operational performance of the facilities equipment and system.

Currently, Horizon Utilities tracks and reports on building equipment maintenance and repairs within facilities work orders. This is currently a manual process. Horizon Utilities anticipates automating and centralizing the collection and reporting of data to improve the visibility and accessibility of data during 2014 and 2015.

Planning and Scheduling Project Execution

Ultimately, the facilities Asset Management process combines the output of the ACAs (provided in the BCA, window assessment, equipment and system failure and repair data, roof assessment and security assessments) with the office space and occupancy demand (identified by the Space Study) to determine facility investment requirements. The process for project planning and scheduling is a manual exercise and is based on the highest risk areas, safety risks, operational requirements and affordability.

Results Reporting

Horizon Utilities' Asset Management process is driven by a continuous improvement focus. During 2014, Horizon Utilities will develop and implement key indicators to gauge the effectiveness of the Facilities Asset Management Planning process.

Information Technology

IST Planning Process

The Information Systems & Technology ("IST") capital investment program is a cyclical process with many inputs and variables. This process is demonstrated in Figure 15 below ("IST Planning Process").

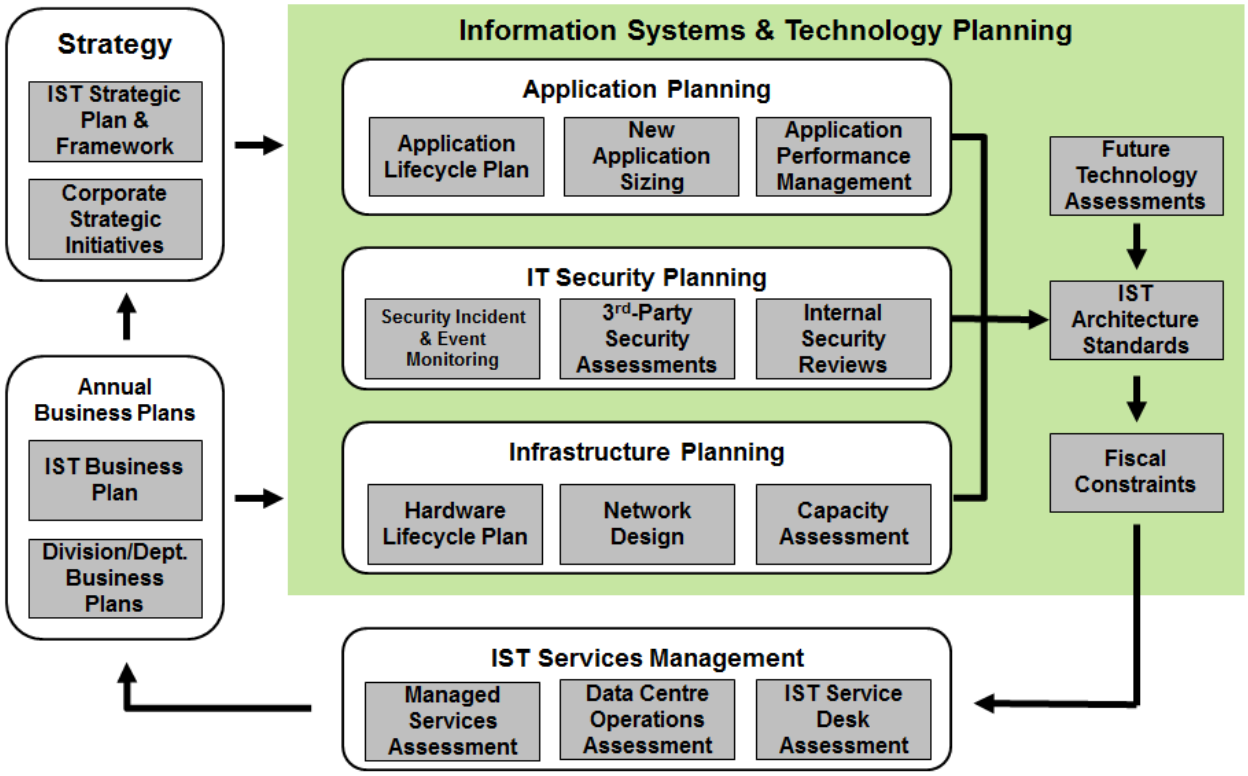

Figure 15 - IST Planning Process

The following is a description of each relevant component of the IST process.

IST Planning

The IST Planning Process focusses on three primary areas: Application Planning; IT Security Planning; and IT Infrastructure Planning.

The Application Planning process is a review and update of the Application Lifecycle Plan to determine business applications that should be upgraded or replaced. Any new applications approved during the business planning process or the IST strategic planning process is factored into application planning. Application performance is reviewed to determine investments required to keep applications running optimally so as to sustain and improve business operations.

The IT Security Planning process consists of a review of the security incident and event monitoring ("SIEM") system logs which identifies security incidents and potential threats. Periodic third-party security assessments are performed to identify potential security risks. Periodic internal security reviews of the IST infrastructure and applications are also performed to identify security changes required to maintain the security of infrastructure and data. Analysis of these processes assists in development of the capital expenditure program related to IT security.

The IT Infrastructure Planning process consists of a review and update of the Hardware Lifecycle Plan to determine which infrastructure items should be replaced or upgraded to maintain operations. The corporate network, advanced metering infrastructure ("AMI") network, and SCADA network design are reviewed to ensure that they have sufficient capacity to support ongoing business operations and approved new applications.

IST Architecture Standards are reviewed and updated based on output from Application Planning, IT Security Planning and IT Infrastructure Planning. Also factored into the IST standards are new and evolving future technologies as identified by leading IT technology research companies like Gartner, Inc. and Info-Tech Research Group.

IST Services Management

Based on the results of the IST Planning Process, IST services management is reviewed to determine the best option for IST resourcing to support the secure and optimal performance of the IST environment to maintain business operations. This consists of reviews of third-party managed services, data centre operations, and IST service desk capabilities.

Each division or department develops a five year business plan. These business plans are reviewed with IST to identify any requirements for enabling IT investments and resource

support. The IST Business Plan is effectively informed by and developed in conjunction with department business plans. The IST business plan identifies the IST capital investment and IST operational changes to support business operations over a five year period. The five year financial plan is reviewed and approved by the Horizon Utilities Board of Directors, which results in specific approved IT projects.

Fleet Vehicles

Horizon Utilities' fleet inventory comprises 189 vehicles including 44 trailers. Horizon Utilities performs fleet assessments annually to determine the condition of each individual fleet unit. The assessment include: reviews of the mileage, engine hours, utilization, and power take off ("PTO") hours for each unit; and the identification of units that meet the following replacement criteria.

Fleet Class	Replacement Assessment Criteria
Light Duty Vehicles:	Assessed at six years and every year after, and/or high mileage (excess of 150,000 km) Replacement schedule: at 6 to 8 years
Heavy Duty Vehicles:	Assessed at 11 year service, and every year after, and/or high mileage (excess of 200,000 km) High engine hours (excess of 15,000 engine hours) Replacement schedule: at 16 to 19 years
Trailers:	Trailer replacement will follow the same core principles as the vehicle replacement criteria with the following differences: • When assessing trailer conditions, trailers will be refurbished rather than replaced. • Where trailers cannot be refurbished due to application change or condition, trailers will be flagged for replacement.

Table 3 - Fleet Replacement Criteria

Horizon Utilities' fleet replacement criteria was developed internally through experience gained in utility fleet operations regarding vehicle lifespan and operating costs. The fleet replacement criteria is periodically validated through comparison with other utilities and Horizon Utilities vehicle replacement criteria is consistent with the best practice for utilities in Ontario.

Horizon Utilities continues to use: data collected from GPS units on each vehicle; work order details on maintenance worked performed; manufacturer's standards; and related regulations policies to determine vehicle replacements to review and assess the fleet replacement criteria.

The fleet replacement assessment criteria was modified in 2011 to extend the service life for Light Duty and Heavy Duty vehicles. As a result of this change, the service life expectancy of Horizon Utilities' vehicles has increased by one year.

The results of the assessment, and the forecasted needs of the organization are evaluated to determine whether the vehicle should be retained, reallocated, or replaced.

Vehicles identified as requiring replacement are further assessed to determine the nature of replacement: replacement with the same class of vehicle or replacement with a different vehicle configuration, based upon the forecasted need of the workforce. Vehicle refurbishment is also considered, particularly for large and expensive vehicles such as bucket and digger derrick trucks.

The Fleet Replacement Plan (included as Appendix O) is updated annually to identify investment requirements over the next six years. The investment requirements for the 2015 to 2019 Test Years are summarized in Section 3.1.3.

Tools, Shop and Garage Equipment

This program includes capital expenditures pertaining to the replacement of tools, shop and garage equipment, which are either worn, have come to the end of their useful life, or the continued use of such creates health and safety risk. The asset management and lifecycle optimization of each of the programs above is further detailed below in Section 2.3.

Work Management Process

Work Management involves the complete lifecycle of distribution construction projects; commencing with project design and continuing through material procurement, construction, and financial closure. This process impacts several departments which adds a great deal of complexity through integration. Horizon Utilities has identified opportunities to improve work management processes through improved project planning, reduced inventory levels, increased crew utilization through improved crew scheduling, and improved construction job planning.

Planning and Scheduling Project Execution

As discussed in Section 1.3.1, the iPass initiative was launched in 2012 to improve productivity by reducing manual processes; more efficient human resource utilization, reducing actual

deployment and tool time; as well as enhancing inventory availability. This initiative balances resources to work loads across all work centres and, through a centralized approach, capitalizes on economies of scale.

Prior to this implementation, the legacy process for planning and scheduling was a manual exercise that consisted of more than 15 processes and over 750 discrete activities. The legacy processes: were unproductive; impacted productivity; did not allow management visibility on the effective use of resources and inventory; and did not allow management to evaluate if the work planned was executed in the appropriate time frames.

Through the iPass initiative, responsibility for each step within the work management processes was clearly identified improving accountability while providing end to end reporting and visibility to all jobs; whether in the planning process or in construction. This accountability and visibility allows accurate measurement of performance in adhering to project timelines and milestones. Project variances, to either budget or schedule, are analyzed to identify the source of the problem. Problems common among multiple projects are reviewed to identify solutions in an attempt to prevent reoccurrence in future projects.

In addition to implementing best practices in utility management, iPass increases customer satisfaction through: the efficient identification of priority jobs, reduction of project lead times, and effective communication with the customer. Specifically, iPass improved the transparency to project dates and milestones allows Horizon Utilities' the ability to communicate deliverables and dates to the customer. The improved processes provide Horizon Utilities an improved ability to achieve these commitments without having to reschedule and disrupt the customer.

As illustrated in the Figure 16 below, the iPass Initiative is a continuous process that allows for constant adjustment and improvement to maximize Work Management.

Figure 16 - iPass Continuous Improvement Cycle

The objectives of iPass are to create a detailed centralized work schedule, integrating project scheduling, inventory management, and resource ability to respond to customer expectations, improve the predictability of planned work, and measure unplanned activities. Creating a centralized schedule allows stakeholders in the work management process access to as close to real time information as possible regarding the project through the entire life cycle. The resulting work schedule is visible to all construction, engineering, customer connections and supply chain personnel that have involvement with and accountability for various elements of the planning and execution of projects. The schedule displays the current status of current projects as well as key information on future scheduled work. The planning and scheduling group ("Planning and Scheduling") provides the data to measure productivity, which in turn enables the improvement of budgetary estimates and forecasting of project costs.

There are currently over 500 active projects that require hands-on management and visibility throughout the entire process. The detailed centralized work schedule is the key enabler for the effective planning, scheduling, and execution of these diverse projects.

Results Reporting

Horizon Utilities' Asset Management process is driven by the objective of continuous improvement. This improvement is only accomplished by accurate and timely reporting on the effectiveness of the process. The metrics used by Horizon Utilities are described above in Section 1.3.1.