Collus PowerStream Corp.
Asset Management Plan

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1.0 Introduction

This document outlines the Collus PowerStream (CPS) Asset Management Plan for the period 2013 to 2017. The report also identifies recommendations to improve on the available asset data and the potential to implement a more structured and analytical asset management strategy. This report focuses on asset inspection and maintenance, capital expenditure planning and the required supporting information management systems.

In developing this asset management plan, the following factors were considered:

- available asset inventory
- asset condition based on the current inspection processes, and
- current capital expense programs, as identified by CPS staff

This report is based on currently available information. CPS fully expects to improve on the level of detail and process of assessment of available data for future reports. Observations for improvements in inspection, data collection, supporting systems and related asset management processes are also identified.

CPS Inc. provides electricity delivery and services to the municipalities of Collingwood, Creemore, Stayner and Thornbury, within their respective municipal boundaries. The four communities are mature areas with a customer density of 46.38 customers per kilometre of line. The total population, as provided by the Towns, is about 27,000, with a total service area of 57 square kilometres. The utility presently serves approximately 15,723 customers. The system consists of over 339 kilometres of primary conductor, both overhead and underground and more than 2,192 distribution transformers, supported by approximately 4,947 poles. The distribution network includes 14 sub-transmission stations owned by CPS.

CPS operates from the Town of Collingwood, which is its largest service area. CPS does not host any utilities and does not have any embedded utilities within its service area. CPS itself is embedded within Hydro One.

The current CPS system was created by the amalgamation of several smaller systems belonging to the towns and villages currently serviced by CPS. The distribution systems in these areas are operated independently since they are not directly connected to one another, as shown on Figure 1. This is further reflected in the following sections of this report.

Table 1 below shows the most recent five-year Customer Statistics, showing growth and maturity of the four areas serviced by CPS.

- Over the past five years the demand from customers serviced by CPS has reduced since two large industrial customers moved their operations elsewhere.

- During this same period the number of residential customers has increased by approximately 10%. This trend is expected to continue as Collinwood becomes a more residential area.

- The area of the communities serviced by CPS has remained stable, and has been consistently winter peaking.

Figure 1 - CPS Service Areas

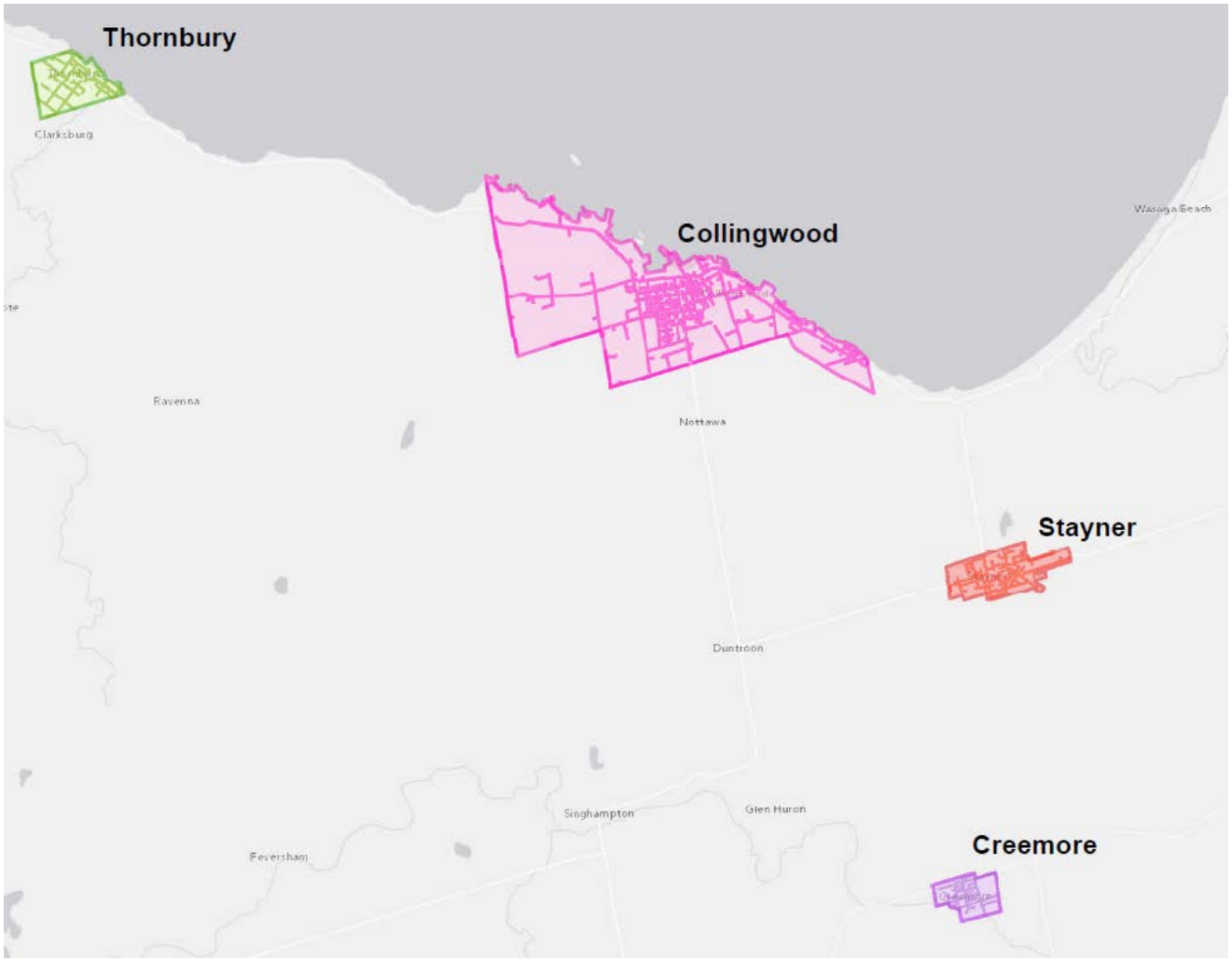


Table 1 – CPS General Statistics as of September 13, 2012

	2007	2008	2009	2010	2011
Population Served	**23,600**	**25,000**	**26,000**	**27,000**	**27,000**
Municipal Population	23,600	25,000	26,000	27,000	27,000
Seasonal Population	0	0	0	0	0
Total Customers	**14,325**	**14,387**	**14,908**	**15,533**	**15,723**
Residential Customers	12,535	12,700	13,152	13,727	13,897
General Service <50 kW Customers	1.667	1,566	1,609	1,687	1,682
General Service >50 kW Customers	121	120	116	119	144
Large User (>5000 kW) Customers	2	1	0	0	0
Total Service Area (km²)	**57**	**57**	**57**	**57**	**57**
Rural Service Area (km²)	0	0	0	0	0
Urban Service Area (km²)	57	57	57	57	57
Total kWh sold (excluding losses)	331,005,902	322,535,808	306,783,697	313,057,702	307,217,400
Total Distribution Losses (kWh)	11,060,211	10,710,893	10,478,319	10,014,550	13,362,696
Total kWh Purchased	**342,066,113**	**333,246,701**	**317,262,016**	**323,072,252**	**320,580,096**
Winter Peak (kW)	62,291	57,168	59,168	57,125	58,755
Summer Peak (kW)	50,409	48,384	46,966	51,307	50,957
Average Peak (kW)	53,215	49,474	46,907	48,942	49,878

The capital program presented later in this document consists of projects driven by factors such as safety, system reliability, customer demand and system loss reduction. CPS will be developing a capital expense model based on a set of corporate criteria with appropriate weight factors applied. Consideration was given to direction provided by the CPS Board of Directors, Town Official Plan and private developers. The web links below provide a reference to official plan documents. Each project identified by CPS is supported by the appropriate documentation in Section 10.

The official plans for the communities served by CPS are linked here:

Town of Collingwood
http://www.collingwood.ca/files/photos/docs/Dec11ConsolidatedOP.pdf

The Town of Collingwood Residential Policy Review
See Appendix A

Stayner & Creemore
http://www.clearview.ca/home/information/publications

Thornbury
http://www.thebluemountains.ca/public_docs/documents/3-%20Approved%20Version%20March%202007.pdf

In addition, the Ministry Infrastructure has a strategic vision for growth for the CPS area and can be found here:
https://www.placestogrow.ca/images/pdfs/Proposed_Amendment_1.pdf

This Asset Management Plan is a 'living document' and will be reviewed on an on-going basis.

2.0 CPS Distribution System Overview

The CPS Asset Management Plan primarily focuses on the assets summarized in the table below. These assets represent the major equipment as defined by the *ESA Equipment and Material Guideline*. The subsequent sections of the report provide further detail and assessment of each asset type. The table also identifies some key system indicators.

Table 2 - CPS System Summary Overview 2012

System Peak (kW – annual average)	58,755
Service Area (sq. km)	57
Total Customers	15,723
GS > 50	144
GS < 50	1,682
Residential	13,897
Smart Meters (to date)	15,981
PME's	8
Poles	4,947
Primary Lines (km)	339
Overhead	207
Underground	132
Transformers (units)	2,192
OH	1,062
UG	1,114
44kV Switches Load Break	9
44kV Switches airbreak	66

2.1 Inspection

CPS has implemented and follows inspection and maintenance procedures in accordance with the Distribution System Code (DSC), Regulation 22/04, Sections 4 and 5, and ESA Guidelines.

These procedures were implemented in 2007, and are supported by the Patrol Deficiency Record. The details covered by this Record are identified in the individual major equipment sections.

For the purpose of this report, these documents collectively, will be referred to as the CPS Inspection and Maintenance Procedures.

All line patrols and inspections are documented using the reports found in the DSC. The asset inspection data and available device information is used to support maintenance activities and capital expense planning. Specific inspection and testing processes are dependent on the asset type.

CPS recognizes that a longer term plan is required to better manage its assets in the future. The implementation of an asset management system with all data linked to a Geographic Information System has facilitated the interpretation of data and allows for better planning of work orders and inspections.

With the use of their asset management system, CPS fully expects to continue to correlate asset condition data, asset maintenance and replacement expenditures and the resulting system performance indicators. These systems and their information will collaborate and support the experience of CPS staff.

2.2 Maintenance and Operating Activities

CPS performs a number of maintenance and operating activities to ensure a safe and reliable operation of the distribution system. These activities are budgeted on an annual basis and are presented in Table 15 of Section 10 of this report.

2.2.1 Locates and Connections

CPS provides locating services for the residents served by CPS and also in response to contractors performing work on and around the CPS underground system. Locate activities have been tracked since 2008. Although locate activities vary year to year, they remain stable and manageable.

Service layouts are prepared for any new home construction (in-fill) or service upgrade due to the expansion of the residence on existing lots. Table 1 indicates there has been a steady increase in applications for new residential services over the last five years. This trend may be slowing as seen in 2011. Growth remains strong in the CPS service areas: this is reflected by the number of new connections over the last five years, as shown in Table 3**.**

Table 3 - Four Year Locate and Connection Summary

	2007	2008	2009	2010	2011
Average Customer Count	14,312	14,553	14,876	15,358	15,562
Number of Locates	*	1366	1811	1655	1716
Number of New LV Connections	396	500	591	464	343
Number of New HV Connections	14	6	7	4	15

*Records are not available for 2007.

2.2.2 System Performance

CPS measures system performance indicators in accordance with the Distribution System Code. The following is a summary of the key system performance indicators for the past five years:

Table 4 - Five Year System Performance Summary

		2007	2008	2009	2010	2011
Average Customer Count		14,312	14,553	14,876	15,358	15,562
Number of Interruptions		38	81	46	24	41
Total Customer Hours of Interruptions		81.65	260	104.65	51.50	96.40
SAIDI		2.23	28.12	1.87	1.10	1.35
SAIFI		0.83	25.84	1.75	1.03	0.96
CAIDI		2.69	1.09	1.07	1.07	1.41
Excluding loss of service from Hydro One	SAIDI	1.87	1.04	1.06	0.78	0.87
	SAIFI	0.55	3.13	1.12	0.83	0.71
	CAIDI	3.40	0.33	0.95	0.93	1.22

Weather events are the primary cause of outages on the CPS system. This results in the yearly fluctuations seen in the data of Table 4. The CPS service areas are located near or on the shores of Georgian Bay. This results in weather conditions which can be more severe than other parts of the province.

2010 shows a large increase in the number and severity of outages on the CPS system. Hydro One preformed work on the TS feeding Collingwood in 2010, which led to a larger than normal number and length of outages. In the case of Collingwood, the number of outages has been seen to decrease significantly since the completion of the Hydro One station upgrades. The 2012 reliability numbers will show this once available.

Table 4 shows an overall improvement in system performance statistics when loss of service from Hydro One scenarios are excluded. CPS's true system performance is indicated by removing the effect of the supplier's outages. Since CPS is an embedded utility, they have no direct control over the supplier's outages.

2.3 Capital

It is important that assets are not replaced before the end of their useful life. It is generally accepted in industry that, rather than age, the asset "stress" is a more determining factor of asset life and an indicator for the required maintenance or replacement of the asset. It therefore stands to reason, that assets under greater stress should be monitored more closely and maintained more than those under less stress. This ensures a wise use of limited capital and maintenance expenditures.

CPS has implemented an asset management system, supported by engineering analysis tools. CPS is continuing efforts to improve the information available in its asset management system for all major equipment. The primary future focus will be to gather available information on transformers installed, including serial numbers, age and condition.

The improved asset data will be used to provide additional information for future asset assessments and determine which assets are under more stress and therefore require replacement or additional maintenance.

3.0 Substations

CPS owns and operates 14 substations. The station data is summarized in Table 5 below. They are located within town limits, as shown in Figures 2 through 5. Each station is controlled by appropriately rated loadbreak and/or airbreak switches. A brief description of each station is provided in the subsections below.

Table 5 - Substation Data

Station	Year Energized	Voltage	Transformer Size	No. of Feeders	HV Protection	LV Protection
Collingwood MS1	1972	44 – 2.4 kV	6.0 MVA	5	S&C SMD-2C 125E Fuse	GE Magnablast 1200A Breaker
Collingwood MS2	2008	44 – 2.4 kV	8.0 MVA	5	S&C SMD-50 100E Fuse	FPE DST25-250 1200A Breaker
Collingwood MS3	1966	44 – 2.4 kV	3.0 MVA	3	S&C SMD-50 100E Fuse	GE Magnablast A2M-4.16-150 1200A Breaker
Collingwood MS4	1967	44 – 2.4 kV	5.0 MVA	4	S&C SMD-2B 100E Fuse	GE Magnablast A2M-4.16-150 1200A Breaker
Collingwood MS5	2007	44 – 2.4 kV	10.0 MVA	6	S&C SMD-2C 125E Fuse	Cutler Hammer A2M-4.16-150 1200A Breaker
Collingwood MS6	1985	44 – 2.4 kV	6.0 MVA	5	S&C SMD-2C 125E Fuse	BBC 5 HK 1200A Breaker
Collingwood MS7	1989	44 – 2.4 kV	5.0 MVA	5	S&C SMD-2C 100E Fuse	S&C Minirupter 600A Fuse Holder
Collingwood MS8	2007	44 – 2.4 kV	4.0 MVA	4	S&C SMD-2C 100E Fuse	S&C Minirupter 600A Fuse Holder
Collingwood MS9	2010	44 – 2.4 kV	10.67 MVA	5	S&C SMD-2C 175E Fuse	Cutler Hammer 50VCP-W2250 1200A Breaker
Collingwood MS10	2008	44 – 2.4 kV	6.0 MVA	3	S&C SMD-2C 150E Fuse	Cutler Hammer 50VCP-29WR250 1200A Breaker
Stayner MS1	1973	44 – 2.4 kV	5.0 MVA	3	S&C SMD-2C 100E Fuse	S&C Outdoor Metalclad 400A
Stayner MS2	1986	44 – 2.4 kV	5.0 MVA	3	S&C SMD-2C 100E Fuse	S&C Minirupter 400A
Thornbury MS1	1976	44 – 4.8 kV	6.0 MVA	4	Dominion PE 125E Fuse	Markham Electric, Delle Rangs 600A
Thornbury MS2	1986	44 – 4.8 kV	5.0 MVA	3	S&C SMD-2C 100E Fuse	S&C Outdoor Metalclad 400A

Collingwood, Stayner and Thornbury are supplied by the 44kV system. This system is owned and operated by Hydro One outside of the municipal boundaries and owned and operated by CPS inside the municipal boundaries. The low side of these stations supplies either 4.16kV or 8.32kV as shown in Table 6.

Table 6 - CPS Stations at Voltage by Community

Community	4kV	8kV
Collingwood	10	-
Creemore	-	-
Stayner	2	-
Thornbury	-	2

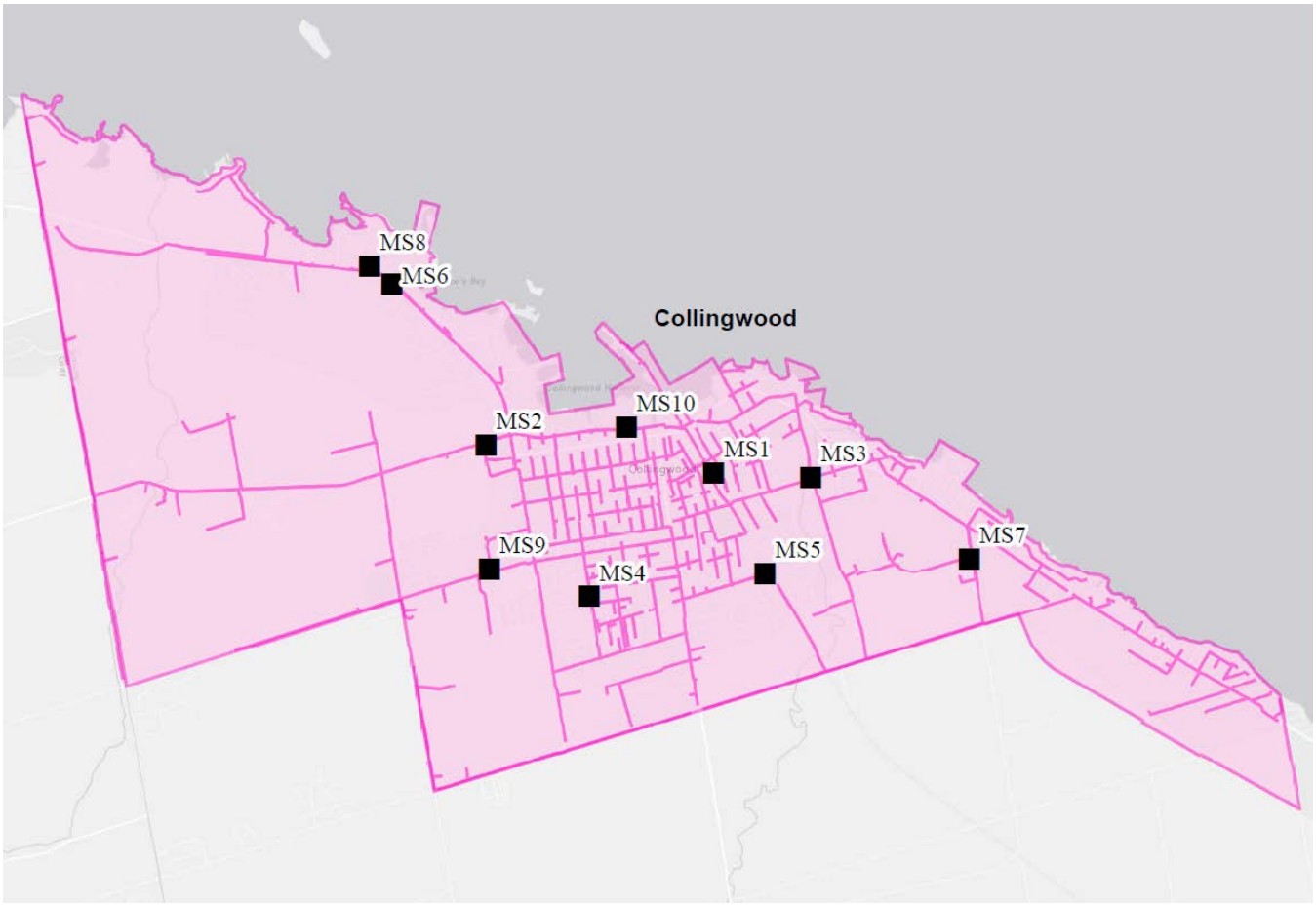
Hwy 26 West of Collingwood and Creemore are supplied by the 8.32kV system. This system is owned and operated by Hydro One outside of the municipal boundaries and owned and operated by CPS inside the municipal boundaries.

3.1 Collingwood

In the Town of Collingwood CPS currently owns and operates 10 municipal stations, supplied by the 44kV system. These stations provide 4.16kV feeders which supply the town's Commercial and growing residential population. With the additions of MS9 in 2008 and MS10 in 2010 the number of stations in Collingwood now allows for improved switching and station maintenance. This also results in improved reliability indices as shown in Table 4.

Along Hwy 26 East of Collingwood there is a feeder fed directly by Hydro One rather than one of the town's stations. This stretch of highway operates at 8.32kV.

Figure 2 - Collingwood Stations



Collingwood MS1, 180 Ontario Street

Collingwood MS1 provides service to the North Central part of Collingwood. The area includes the commercial business area in the downtown core as well as residential customers to the East and West of Hurontario (Main) Street. The transformer is a 6 MVA and has five feeders all of which are currently in use. The station is currently protected by S&C SMD-2C, 125A type E Power fuses on the HV side and GE Magnablast, AM-4.16-150-8C 1,200A rated breakers set to 500A on the low side protecting each feeder. This station has been in operation since 1972.

Collingwood MS2, 20 Old Mountain Road

Collingwood MS2 provides service to the North Central and West part of Collingwood. The area includes the major commercial area along the First Street corridor and the Western Node Commercial area. It also provides service to residential areas West off of Mountain Road. The transformer is an 8 MVA and has five feeders all of which are currently in use. The station is currently protected by S&C SMD-50, 100A type E Power fuses on the HV side and FPE DST2, DST25-250 1,200A rated breakers set to 600A on the low side protecting each feeder. This station has been in operation since 1978 with an upgrade to the Power Transformer in 2008.

Collingwood MS3, 495 Hume Street

Collingwood MS3 provides service to the Northeast portion of Collingwood. This section includes the Pretty River Parkway and Hume St East commercial areas. The transformer is a 3 MVA and has three feeders all of which are currently in use. The station is currently protected by S&C SMD-50, 100A type E Power fuses on the HV side and GE Magnablast, AM-4.16-150 1,200A rated breakers set to 360A on the low side protecting each feeder. This station has been in operation since 1966.

Collingwood MS4, 438 Walnut Street

Collingwood MS4 provides service to residential load in the Southwest portion of Collingwood. The transformer is a 5 MVA and has four feeders all of which are currently in use. The station is currently protected by S&C SMD-2B, 100A type E Power fuses on the HV side and GE Magnablast, AM-4.16-150 1,200A rated breakers set to 360A on feeders F1 and F3, 600A on feeder F2 and 400A on feeder F4 protect the low side. This station has been in operation since 1967.

Collingwood MS5, 47 Sproule Avenue

Collingwood MS5 provides service to the South East Central part of Collingwood and the load type is residential. The transformer is a 10 MVA and has six feeders, four of which are currently in use. The remaining two feeders are for future expansion of load in the growth area the Southeast. The station is currently protected by S&C SMD-2C, 125A type E Power fuses on the HV side and Cutler Hammer 50VCPTR25 600A rated breakers on the low side protecting the feeders. F2 is set to 200A, F3 is set to 600A and F1, F4 as well as future F5 and F6 are set to 400A. This station has been in operation since 2007.

Collingwood MS6, 11383 Highway 26 West

Collingwood MS6 provides service to the Northwest part of Collingwood. The area serviced is comprised of mainly condominium and residential load. The transformer is a 6 MVA and has five feeders, four of which are currently in use. The remaining feeder is for future expansion of load. The station is currently protected by S&C SMD-2C, 125A type E Power fuses on the HV side and BBC 5HK 1,200A rated breakers set to 600A on the low side protecting each feeder. The Feeder F3 is not currently in use but will be set to 600A. This station has been in operation since 1985.

Collingwood MS7, 2 Sanford Fleming Drive

Collingwood MS7 provides residential service to the Eastern and Southeast portions of Collingwood. This area also includes the Sanford Fleming Business Park which is light industrial and commercial class load. The transformer is a 5 MVA and has five feeders, of which three are currently in use. The remaining two feeders are for future expansion of load. The station is currently protected by S&C SMD-2C, 100A type E Power fuses on the HV side and S&C Minirupter, 600A with SMU-40 400A type E fuses on the low side protecting each feeder. Feeders F1 and F4 are not currently in use but will be fused to 400A. This station has been in operation since 1989.

Collingwood MS8, Lighthouse Point Highway 26 West

Collingwood MS8 provides residential service to the condominium developments known as Lighthouse Point and Rupert's Landing which are located along Hwy 26 West. The transformer is a 4 MVA and has four feeders all of which are currently in use. The station is currently protected by S&C SMD-2C, 100A type E Power fuses on the HV side and S&C Minirupter, 600A with SMU-40 400A type E fuses on the low side protecting each feeder. This station has been in operation since 2007.

Collingwood MS9, 43 Stewart Road

Collingwood MS9 provides residential service to the Southwestern part of Collingwood. The transformer is a 10.67 MVA and has five feeders, three of which are currently in use. The remaining two feeders are for future expansion of load in the growth areas West and Southwest. The station is currently protected by S&C SMD-2C, 125A type E Power fuses on the HV side and Cutler Hammer, 50VCP-W250, 1,200A rated breakers set to 600A on feeders F2, F3 and F5 protecting each feeder. Feeder F1, F4 and F6 will be set to 600A when in service. This station has been in operation since 2010.

Collingwood MS10, North Maple Street

Collingwood MS10 provides residential service to the condominium development known as The Shipyards, located in the North Central portion of Collingwood. The transformer is a 6 MVA and has three feeders, two of which are currently in use. The remaining feeder is for future expansion of load. The station is currently protected by S&C SMD-2C, 150A type E Power fuses on the HV side and Cutler Hammer, 50VCP-29WR250, 1200A rated breakers set to 600A on the F1 and F2 feeders. Feeder F3 will be set to 600A when in service. This station has been in operation since 2008.

3.2 Stayner

In the Town of Stayner CPS currently owns and operates two municipal stations which are fed by 44kV. These stations provide 4.16kV feeders which supply the Town. The current number of stations allows for switching between feeders as required for operational and maintenance purposes and provides the capacity for a low number of customer outages.

Figure 3 - Stayner Stations

Stayner MS1, Superior Street

Stayner MS1 provides service to the Eastern half of Stayner with branches covering Williams street and Charles Street. The transformer is a 5 MVA and has four feeders all of which are currently in use. The station is currently protected by S&C SMD-2C, 100A type E Power fuses on the HV side and S&C Outdoor Metalclad, 400A with SM-5S 400A type E fuses on the low side protecting each feeder. This station has been in operation since 1973.

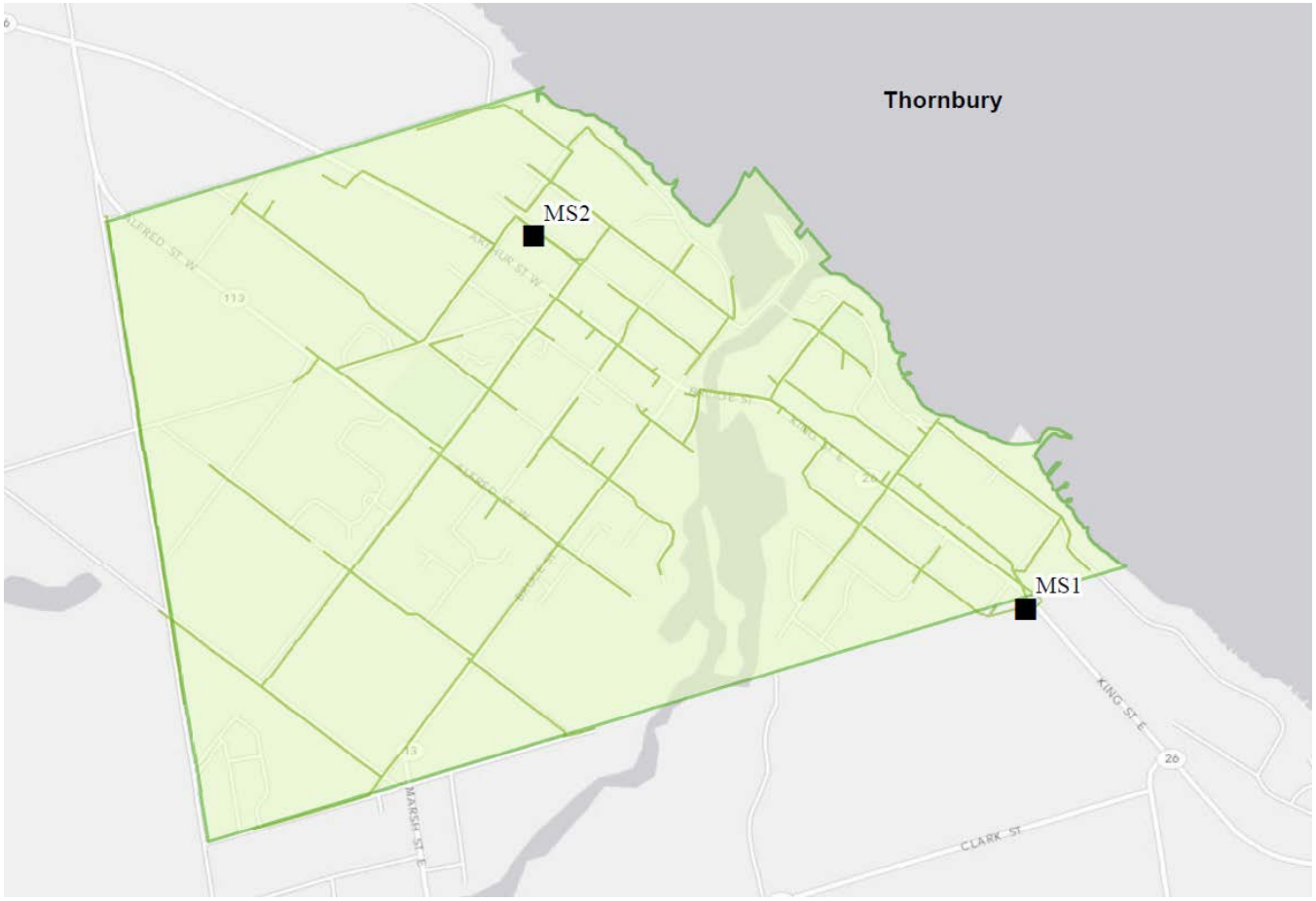
Stayner MS2, 229 Quebec Street

Stayner MS2 provides residential service to the Western portion of Stayner. The transformer is a 5 MVA and has four feeders all of which are currently in use. The station is currently protected by S&C SMD-2C, 100A type E Power fuses on the HV side and S&C Minirupter, 400A with SM-5S 400A type E fuses on the low side protecting each feeder. This station has been in operation since 1986.

3.3 Thornbury

In the Town of Thornbury CPS currently posses two municipal stations which are fed by 44kV. These stations provide 4.8kV feeders which supply the Town. The current number of stations allows for switching between feeders as required for operational and maintenance purposes and provides the capacity for a low number of customer outages.

Figure 4 - Thornbury Stations



Thornbury MS1, 208330 Highway 26

Thornbury MS1 provides service to the Eastern half of Thornbury. The transformer is a 6 MVA and has four feeders all of which are currently in use. The station is currently protected by Dominion PE, 125A type E Power fuses on the HV side and Markham Electric, Delle Rangs, 600A with Westinghouse RBA 200E fuses on the low side protecting each feeder. This station has been in operation since 1976.

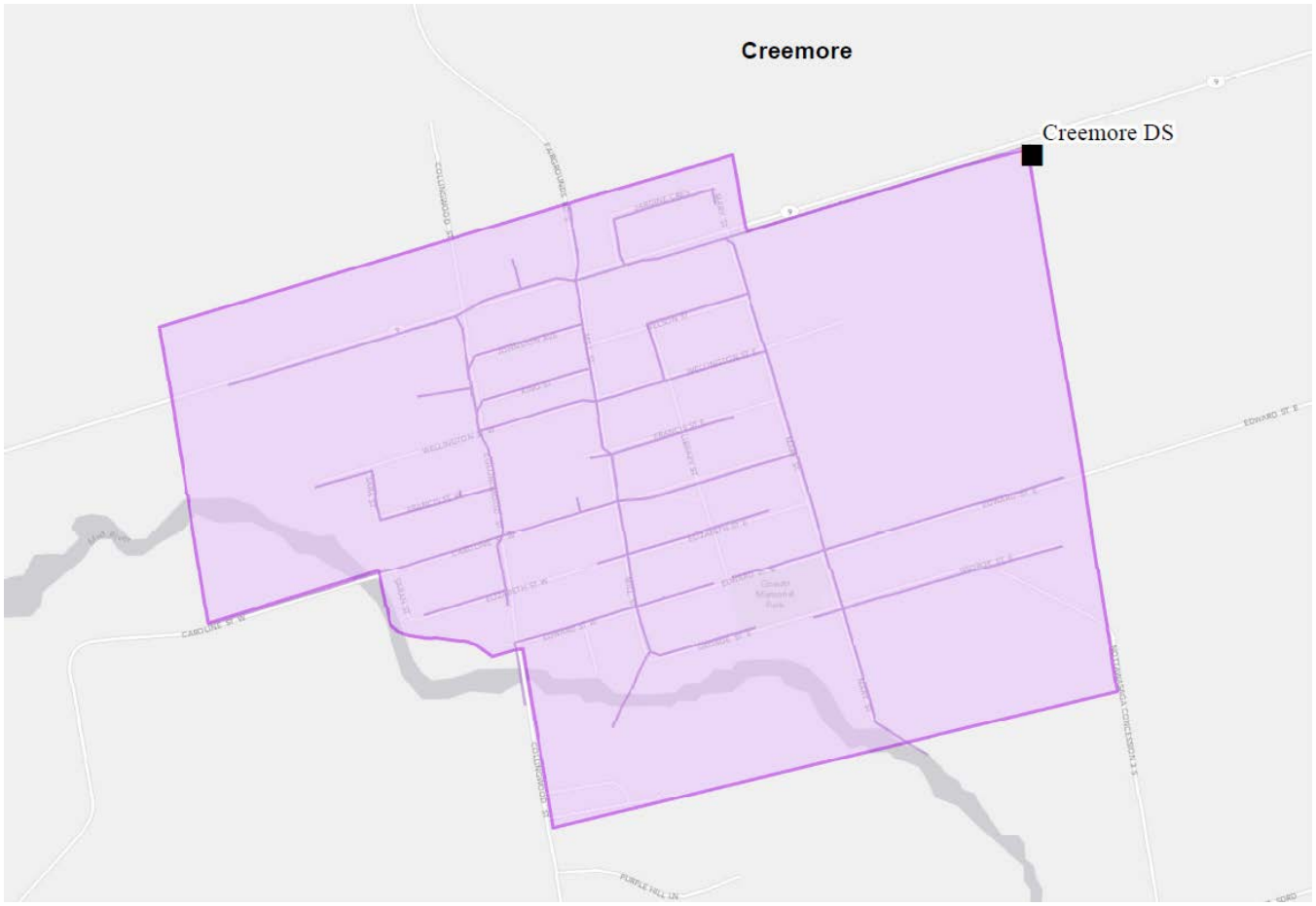
Thornbury MS2, 95 King Street West

Thornbury MS2 provides service to the Western half of Thornbury. The transformer is a 5 MVA and has four feeders all of which are currently in use. The station is currently protected by S&C SMD-2C, 100A type E Power fuses on the HV side and S&C Outdoor Metalclad, 400A with SM-5C 400A type E fuses on the low side protecting each feeder. This station has been in operation since 1986.

3.4 Creemore

There are currently no MS stations in the town of Creemore. Instead the town is supplied directly from Hydro One via a single radial express 8.32kV feeder. The F2 Feeder originates at the Hydro One owned Creemore DS located just outside of town. CPS is planning for the installation of an MS to provide capacity for expansion of the load in the community. This expansion is being driven by the needs of industry in the town as well as new residential subdivision developments. Costs associated with the installation of an MS station in Creemore are included in Section 10.

Figure 5 - Creemore



3.5 Inspections

CPS owns and operates 14 substations, which are patrolled once a month in accordance with the requirements of the CPS Inspection and Maintenance Procedures. Patrols at substations require the use of the *Patrol Deficiency Record* to record any defects or areas of concern which are identified during the visual inspection. Monthly visual inspections for station equipment include the following:

Transformer:

- Paint condition and corrosion
- Phase indicators and unit numbers match operating map
- Leaking oil
- Flashed or Cracked Insulators
- Contamination/discolouration of bushings
- Ground lead attachments

Switches and Protective Devices:

- Bent, broken bushings and cutouts
- Damaged lightning arresters
- Ground wire on arresters unattached

Hardware and Attachments:

- Loose or missing hardware
- Insulators unattached from pins
- Conductor unattached from insulators
- Insulators flashed over or obviously contaminated
- Tie wire unraveled
- Ground wire broken or removed
- Ground wire guards removed or broken

Switchgear:

- Paint condition and corrosion
- Placement on pad or vault
- Check for locks
- Grading changes
- Leaking oil

Vegetation:

- Accessibility compromised
- Grade changes that could expose cable
- Leaning or broken “danger” trees in proximity of station
- Growth into line of “climbing” trees
- Vines or brush growth interference (line or fence clearance)
- Bird or animal nests

3.6 Major Station Maintenance

Preventive station maintenance is conducted on a three year cycle according to the CPS Inspection and Maintenance Procedures and includes the following:

- Testing of Substation Transformers
- Arrester testing
- Breaker and Protection Testing and Maintenance
- General station maintenance

In 2012 the following stations underwent scheduled maintenance:

- Collingwood MS6
- Collingwood MS7
- Collingwood MS8
- Thornbury MS1
- Thornbury MS2

3.6.1 Load and Load Balancing

Each CPS communities, with the exception of Creemore, currently have sufficient station capacity to allow for near future growth while maintaining the capacity to switch between feeders during maintenance and other activities. This will continue to minimize number of outages (SAIFI) and the number of customers affected by each outage.

In 2012 CPS employed the services of a consultant to study whether the communities of Collingwood and Stayner would benefit from switching optimization or load balancing. The consultant considered both changing the systems flow with the currently installed switches as well as the installation of additional switches. It is the opinion of the consultant and CPS that at this time little or no benefit can be obtained through switching and any loss reduction would be offset by the costs of equipment and labour required.

CPS continually monitors station loading year round; this is done remotely in real time using the installed SCADA system.

3.7 Station Metering and Monitoring

CPS currently owns and operates a Supervisory Control and Data Acquisition System. There are Remote Terminal Units and licensed 900 MHz data radio communications equipment in 12 of the 14 municipally owned distribution stations in the CPS service area, as well as SCADA interfaces at 4 of the main 44kV Wholesale Metering PME locations. In addition to existing SCADA infrastructure there are also dial up interfaces to all 8 IESO Registered Wholesale Metering Points.

CPS is able to, in real time, monitor voltage, current and feeder loading on a majority of its distribution system as well as the incoming sub transmission circuits. This information is stored in a historical database and utilized for system planning, feeder balancing, system optimization studies and the possible impact of renewable generation on the distribution system. CPS plans to expand its SCADA network during the next five years; this is reflected in Section 10.

3.8 Station Capital

Based on currently available information, CPS anticipates the need for additional station capacity in the town of Creemore to be energized by 2015. This is based on the load growth projections identified in Section 3.4 above. To achieve the required energization date CPS requires to purchase the land in 2013 and start construction of the station no later than 2014. Amounts have been included in Section 10 for this project.

4.0 Poles

The CPS overhead distribution system is supported by approximately 4,947 poles, primarily wood type. CPS recently undertook to inspect and record all information available for poles currently installed. All tables in this section and the conclusions drawn for this report are based on this information. Visual inspection of poles is conducted in accordance with the Distribution System Code. Currently CPS conducts pole testing using a hammer test only on a select number of poles at this time, to confirm their condition. Poles installed in the last five years have not been hammer tested as part of this survey. Examination of poles is preformed prior to installation and along with regularly scheduled visual inspections is considered sufficient for the first five years. Approximately 1,583 poles have been installed in the last five years and have not been hammer tested. These poles have been omitted from the following table and chart.

Table 7 - CPS Pole Count by Test and Visual Inspection

	VISUAL INSPECTION				
HAMMER TEST	**Replace**	**Poor**	**Fair**	**Good**	**Total**
Solid	199	2	242	702	**1,145**
Future Test	234	645	708	81	**1,668**
Hollow	26	161	42	5	**234**
Rotten	42	77	13	0	**132**
Rotten-Hollow	60	120	4	1	**185**
Total	**561**	**1,005**	**1,009**	**789**	**3,364**

Figure 6 - Pole Count by Test and Visual Inspection

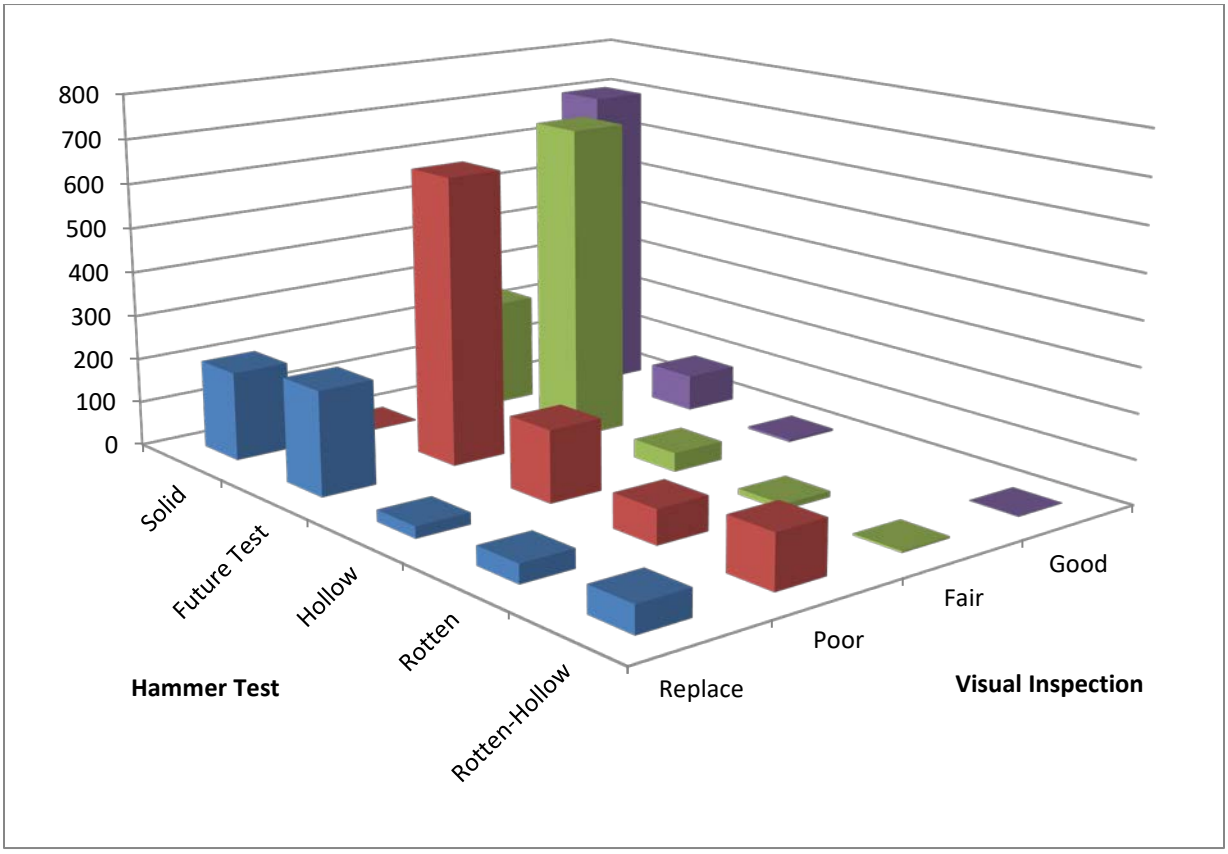


Figure 6 correlates the visual inspection (depth axis) of CPS poles with hammer tests (horizontal axis) made on the same poles. The poles shown toward the front of the chart are those which:

- were found in need of replacement or of being in poor condition during the visual test
- were found to be hollow, rotten or both by the hammer test

486 poles were found to meet both these criteria. These poles will have priority for replacement in this proposed five year plan. This represents approximately 10% of CPS poles over five years, or 2% each year. Wherever possible they will be replaced as part of a project where copper conductor and other equipment are also replaced. The order of priority for replacement of the above poles will be determined by the pole utilization and its condition.

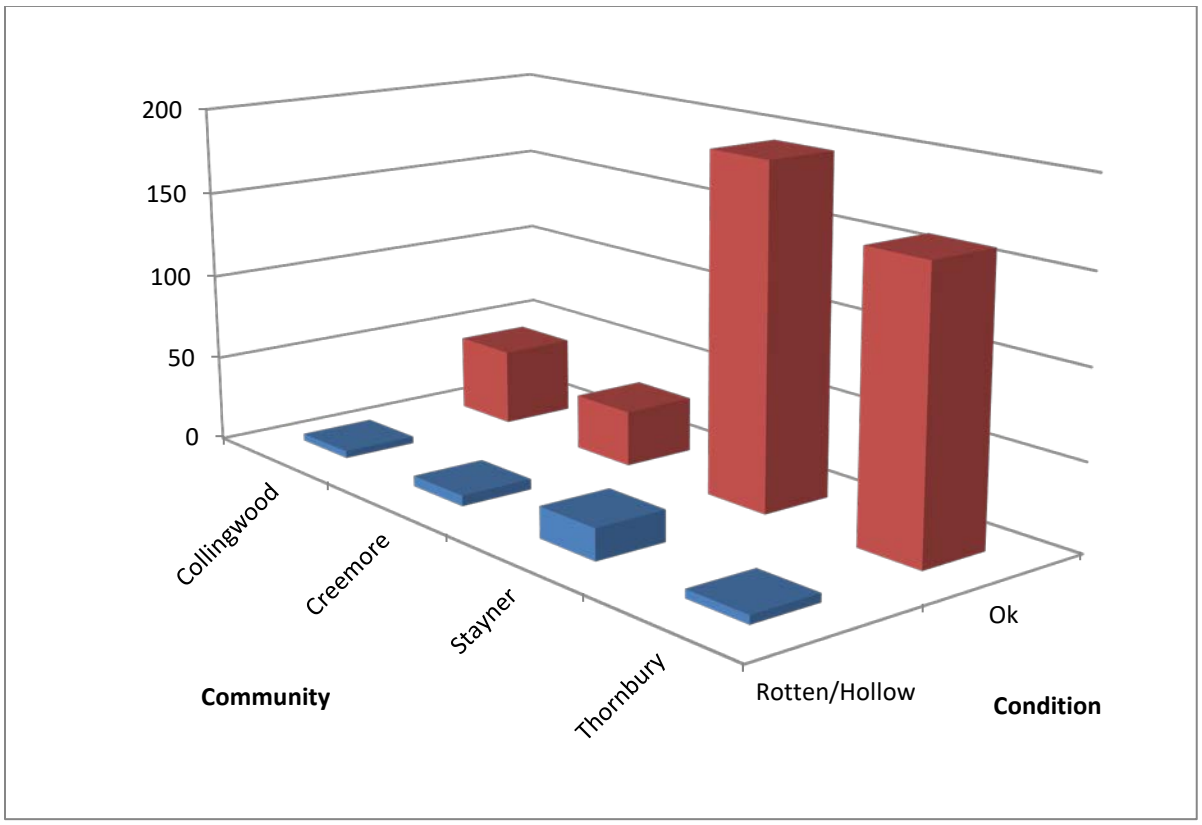
During the late 1970s and 1980s Southern Yellow Pine poles were commonly purchased by Ontario utilities. Industry experience shows these poles to have a shorter useful life expectancy. These poles may pose a safety hazard as they deteriorate more quickly than other wood types. As such all Southern Yellow Pine poles are being considered for replacement. These poles are largely found in Stayner and Thornbury as shown in Table 8. CPS plans to prioritize the replacement of these poles after those identified by the above visual inspection and testing.

Figure 7 shows where 33 Southern Yellow Pine poles overlap with those identified by the visual inspection and testing (Rotten/Hollow). Excluding these poles the replacement of Southern Yellow Pine will add 432 poles to be replaced in the next five years. This represents 9% of CPS poles being replaced or approximately 2% a year. Some of these replacements will fall under other projects areas targeted for work, while others will be replaced on a case by case basis.

Table 8 - CPS Southern Yellow Pine by Community and Condition

Pole Condition	Collingwood	Creemore	Stayner	Thornbury	Total
Rotten/Hollow	4	6	18	5	**33**
Ok	44	32	195	161	**432**
Total	**48**	**38**	**213**	**166**	**465**

Table 7 - CPS Southern Yellow Pine by Community and Condition



With the use of an asset management system, supported by engineering analysis tools, CPS will be able to determine which pole assets are under more stress and therefore require more frequent inspection, testing and/or maintenance and ultimately replacement. The CPS 5-year pole replacement plan will then be adjusted accordingly.

Pole replacement prioritization is based on three primary criteria identified below:

- The estimated remaining life of the pole.
- The number of customers that will be interrupted if a pole fails. This places subtransmission poles and those carrying multiple circuits as the highest priority. Poles which support only secondary lines are the lowest priority.
- The location of the pole; this accounts for locations such as railway crossing which require grade 1 construction and critical customers such as hospitals.

The criteria of visual inspection, testing and Southern Yellow Pine poles provide a sufficient number of poles that can be effectively replaced in the proposed CPS 5-year plan. Future asset management plans may require consideration of additional criteria to identify poles for replacement.

In addition to those poles scheduled for replacement in the 5-year plan, poles that are identified through reports from line patrols, as a potential health and safety hazard to the public and staff, will be replaced immediately. Also any road authority or private development projects may require pole replacement not specifically identified by inspection and testing.

It is also recognized that an appropriate replacement program must consider the relationship of the pole asset with other assets in its proximity within the distribution system.

4.1 Inspection

Line patrols, conducted in accordance with the CPS Procedures, include a visual inspection of poles for the following:

- Bent, cracked or broken poles
- Excessive surface wear or scaling
- Loose, cracked or broken cross arms and brackets
- Woodpecker or insect damage, bird nests
- Loose or unattached guy wires or stubs
- Guy strain insulators pulled apart or broken
- Guy guards out of position or missing
- Grading changes, or washouts
- Indications of burning

4.2 Pole Capital

The stress placed on a pole is important when considering its lifespan; generally the greater the stress the shorter the lifespan. The stress increases with equipment, such as transformers or utilization, such as dead ended or line angle installations. It is therefore important that they be more closely monitored.

The above pole inspection process has identified the need to replace sufficient number of poles on an annual basis, such that over the course of expected life, all poles will be replaced.

Based on the available data and industry norms, CPS anticipates the need to replace approximately 4% of the pole population or approximately 200 poles annually, in the proposed 5-year plan. This rate of replacement will see all CPS poles replaced every 25 years. Due to the Southern Yellow Pine pole population the proposed 5-year plan is recognizing a more aggressive pole replacement plan then is anticipated in the future. A replacement cycle of 40 to 50 years will be targeted when all Southern Yellow Poles have been replaced. This activity and the corresponding financial requirements are summarized in Section 10.

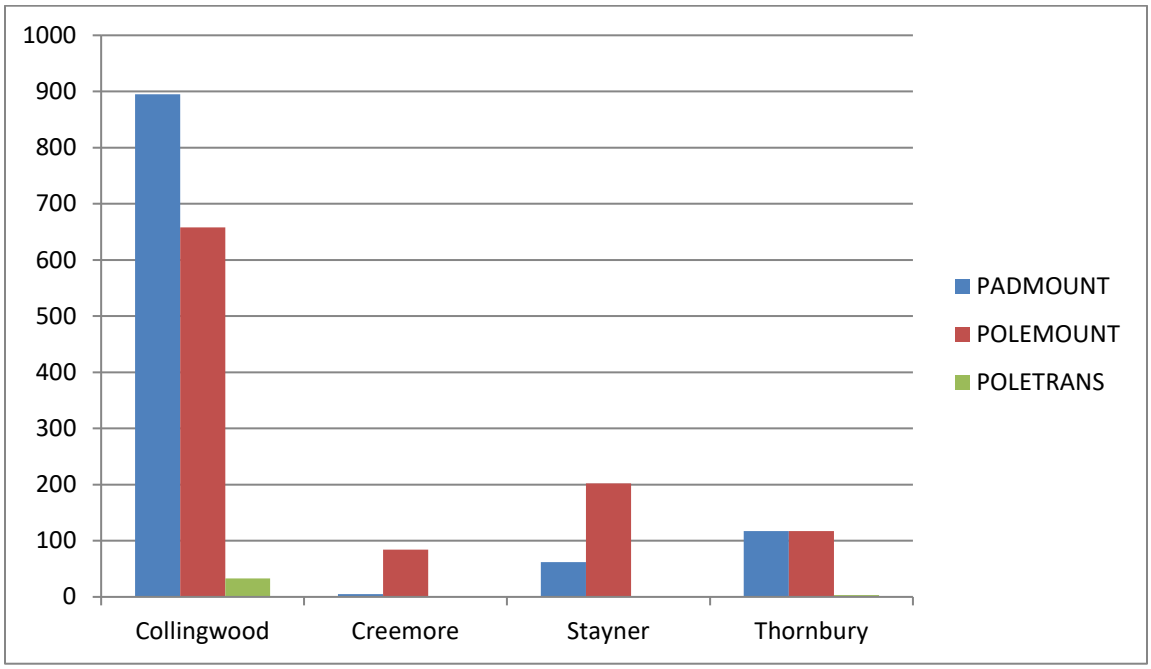
5.0 Transformers

The CPS distribution system consists of 1,062 pole mount, 1,073 pad mount transformers and 41 poletrans. Data on transformer units will be improved in the coming years as CPS works to improve the data that has been historically recorded. The following table shows a summary of the overhead and underground transformers by community.

Table 9 - Transformer Count by Community

	Polemount	Padmount	Poletran	Total
Collingwood	659	889	38	**1,586**
Creemore	84	5	0	**89**
Stayner	202	62	0	**264**
Thornbury	117	117	3	**237**
Total	**1,062**	**1,073**	**41**	**2,176**

Figure 8 - Tranformer Count by Community



As seen in Figure 8 each of the communities serviced by Collus Power has a different mix of padmount and polemount units. This is attributed to the separate philosophies adhered to by the individual community utilities before becoming part of CPS.

It should also be noted that Creemore, the town with the oldest plant, has a majority of overhead transformers while in Collingwood where there has been more new construction shows a larger number of padmount units. This follows a trend in the industry towards new subdivisions using underground distribution systems with padmount transformer.

Design practices of utilities, particularly in the past 25 years, have been to substantially oversize transformers for the average load required to be supplied. A typical utility average transformer utilization factor is between 20-35%.

As transformer data becomes available it can be integrated with the existing CPS customer information. This together with the connectivity model and weather data, will allow CPS to determine which transformers are under more stress and therefore require closer monitoring or maintenance and an appropriate replacement program. The additional data will also allow CPS to determine opportunities to consolidate transformer sites thereby reducing transformer losses.

5.1 Inspection

CPS visually inspects transformers every three years under the Overhead Visual Inspection and Underground Visual Inspection Programs and Record and follow-up on any complaints received from customers. The inspection of transformers includes:

Polemount Transformers:

- Paint condition and corrosion
- Phase indicators and unit numbers match operating map
- Leaking oil
- Flashed or cracked insulators
- Contamination/discolouration of bushings
- Ground lead attachments
- Damaged disconnect switches or lightning arresters
- Ground wire on arresters unattached

Padmount Transformers:

- Paint condition and corrosion
- Placement on pad or vault
- Check for lock and penta bolt in place or damage
- Grading changes
- Access changes (Shrubs, trees etc.)
- Phase indicators and unit numbers match operating map (where used)
- Leaking oil
- Lid Damage, missing bolts, cabinet damage
- Cable connections
- Ground connections
- Nomenclature
- Animal nests/damage
- General Condition

5.2 Transformer Capital

A number of units are replaced annually, as part of projects driven by ongoing system improvements. With the addition of a transformer load management system, CPS will have improved information to identify overloaded or stressed transformers requiring replacement.

CPS completed a thorough PCB program in the late 1980's. All overhead transformers were tested and those with unacceptable levels of PCBs were drained and refilled with new oil.

Replacement of transformers is completed as a part of maintenance and capital projects. Based on the available data and industry norms, CPS would anticipate the need to replace approximately 6.5% of its transformer population or 140 transformers during the next five years. This activity and the financial requirements are summarized in Section 10.

It is worth noting that not all transformers removed from service will be retired. A number of transformers may be inspected, refurbished and/or repaired as required and placed back into service in a more appropriate location. This will effectively extend the asset life and reduce the replacement cycle identified above.

CPS also has a number of live front transformers. Live front transformers are not the current industry standard and will be replaced over time as part of system improvements. Their replacement will be completed in conjunction with the replacement of 5kV underground cable feeding them.

The CPS system currently includes 41 poletran units which are being phased out of service. The replacement of these poletran units has been made a priority as their bases have begun to deteriorate beyond acceptable levels as seen in Figure 9. 38 of the 41 poletran units are installed in Collingwood. Due to high cost of replacement, five poletrans will be replaced every year above and beyond any identified system maintenance. These replacements have been identified in Section 10 of this report and represent approximately 2% of all transformers.

Figure 9 - Sample Corroded Poletran base

6.0 Switches and Cutouts

6.1 Cutouts

CPS relies upon cutouts for control, sectionalizing and downstream protection coordination of its 8.32kV and 4.16kV systems. These cutouts can be used in single, two or three phase installations. Two phase installations are less common. The number of each configuration, found in each community is shown in Table 10.

Table 10 - Cutouts by Community

Community	Single Phase Installations	Two Phase Installations	Three Phase Installations	Total number of Cutouts
Creemore	27	0	9	**36**
Collingwood	307	14	377	**1466**
Thornbury	48	6	50	**204**
Stayner	39	0	46	**177**
Total	**421**	**20**	**482**	**1883**

6.2 Gang Operated Switches

CPS controls the 44kV subtransmission system with gang operated switches. These switches are found in the following locations:

- at the boundary of CPS's system where Hydro One circuits terminate
- at the entrance to stations
- within the boundaries of CPS's system to allow load transfers

These switches are distributed between the communities as shown in the Table11:

Table 11 - Switches by Community

Community	44 kV
Collingwood	12
Creemore	0
Thornbury	9
Stayner	4

6.3 Inspection

CPS has been conducting switch inspection on all Gang operated switches on an annual basis. Each year these switches are inspected for damage and wear.

Additionally visual inspections are carried out on all switches as part of the Overhead Visual Inspection Program. These visual inspections occur once every three years and include:

- Bent, Broken bushings and cutouts
- Damaged lightning arresters
- Ground wire on arresters unattached

Inspection of underground switching equipment is also carried out on a three year cycle, in accordance with the Distribution System Code and include the following:

- Paint condition and corrosion
- Placement on pad or vault
- Check for lock and penta bolt in place or damage
- Grading changes
- Access changes (Shrubs, trees etc.)
- Phase indicators and unit numbers match operating map (where used)
- Leaking oil
- Lid damage, missing bolts, cabinet damage
- Cable connections
- Ground connections
- Nomenclature
- Animal nests/damage
- General Condition

Records of inspection, recorded and stored in a digital format shall be reviewed and priority of follow up scheduling of maintenance and/or corrective action activities will be directed by the Manager of Hydro Services or designate based on the criticality of inspection findings.

6.4 Maintenance

Gang operated switches located on the borders of the CPS system or which control the entrance to a station are maintained yearly. This involves cleaning of the contacts and lubrication on moving parts where required. Additional work is performed wherever the above inspections indicate deficiencies.

CPS recognizes the need to perform additional maintenance on 44kV switches found within the boundaries of the CPS system. These switches are critical to system operation and reliability. The cost for maintenance of all 44kV switches is included in the Operation and Maintenance budget found in Section 10.

Non-gang operated switches are visually inspected according to the inspection program and are maintained as required.

6.5 Switch Capital

Additional 44kV switches will be added to the system where new construction warrants. This will be examined as projects are proposed.

CPS has initiated a plan to replace old 44kV switches. The majority of these switches have been identified in the proposed 5 year capital plan as part of overhead line maintenance.

7.0 Conductor

7.1 Primary

The different communities that make up the CPS service area have evolved independently over time, each with its own specific needs and challenges, including the mix of residential, commercial and industrial loads. One of the results of this is that smaller primary conductors, including #2, #4 and #6 Copper are found in the older parts of Collingwood and in small pockets in Stayner and Thornbury.

The CPS communities have proven favourable for underground construction. Based on CPS experience, when 1/0 cable is installed with the minimum sand padding, the cable life is up to 60 years.

Like overhead conductors the independent evolution of the four communities has led to a mix of different underground cable types installed. 5kV cable is of particular concern and is installed in several pockets in Collingwood.

CPS uses existing system analysis tools to assess the conductor requirements for feeder balancing, line losses and voltage drop. Analysis tools are also used to determine the appropriate feeder routing for loss optimization.

CPS has standardized on the following conductor sizes:

- 44kV circuits are constructed using 556 ACSR
- 4.16kV or 8.32kV systems are constructed using 336 ACSR
- 1/0 Cu is used for general underground construction
- 3/0 or 350 MCM is used for underground express feeds

7.2 Secondary

Although the secondary bus is not always replaced when one customer upgrades their service, should a number of customers supplied by the same transformer upgrade, the secondary would be assessed and replaced based on current standards.

7.3 Inspection

Line patrols are conducted annually in accordance with the CPS Procedures. The line patrols include a visual inspection of the following:

Conductors and Cables

- Low conductor clearance
- Broken/frayed conductors or tie wires
- Exposed broken ground conductors
- Broken strands, bird caging, and excessive or inadequate sag
- Insulation fraying on secondary

Hardware and Attachments

- Loose or missing hardware
- Insulators unattached from pins
- Conductor unattached from insulators
- Insulators flashed over or obviously contaminated (difficult to see)
- Tie wires unraveled
- Ground wire broken or removed
- Ground wire guards removed or broken

General Conditions and Vegetation

- Leaning or broken "danger" trees
- Growth into line of "climbing" plants
- Accessibility compromised
- Vines or bush growth interference (line clearance)
- Bird or animal nests

Vegetation and Right of Way

- Accessibility compromised
- Grade changes that could expose cable
- Excessive vegetation on right of way

7.3.1 Line Patrol

CPS patrols its entire distribution system every three years, in accordance with the CPS Procedures. Distribution system line patrols are tracked using the "*Digital Record of Inspection*". CPS line staff and contractors perform line patrols. CPS staff also inspects the condition of lines whenever they are working in an area.

CPS places emphasis on its informal inspections. Due to the employee's intimate knowledge of the system, CPS expects they will see much of the system in their day to day activities. This results in attention being brought to small issues before they can become problems. As a result of the above the team is provided with a wealth of planning material otherwise unavailable and any future problems can be headed off the next time they will be in the area.

7.4 Overhead System - Tree-Trimming

As part of the regular maintenance plan for the conductor assets, CPS schedules regular tree-trimming activities, as described below.

Vegetation and Right of Way control is required under the Minimum Inspection Requirements of the Distribution System Code and good utility practice. CPS distribution areas include some tourist areas and therefore can be sensitive to tree trimming activities, as indicated by the recent passage of tree preservation laws in Collingwood, found in Appendix B. CPS has a relatively heavy mature tree cover where overhead hydro lines are in the proximity to trees. Tree contact with energized lines can cause the following:

- Interruption of power due to short circuit to ground or between phases
- Damage to conductors, hardware and poles
- Danger to persons and property within the vicinity due to falling conductors, hardware, poles and trees
- Danger of electric shock potential from electricity energizing vegetation

Care must be taken to balance the requirements of customers and stakeholders and safe and reliable operation of the distribution system. In general, the three-phase circuit sections require higher reliability and are therefore trimmed more aggressively than the single-phase circuit sections.

Town of Collingwood policy requires CPS to preserve the appearance of trees and other vegetation. ESA requirements for safe work and system operation, set out in Safety Bulletin DSB 02-09 and Ontario Regulation 22/04, mandate greater clearances. These two forces appear to be in opposition to one another and thus require CPS to tree trim less aggressively on a more frequent basis.

Tree Trimming inspections have been incorporated into the other inspection programs included in this plan and additional checks will be performed by work crews in the area in which regular work is preformed.

CPS performs line clearing in accordance with the CPS Line Clearing Program. Maintenance work orders are issued as a result of field observations and inspections. All work is scheduled accordingly.

To mitigate direct contact between trees and distribution assets, CPS conducts tree trimming in accordance with the CPS Procedures. Depending on the size, shape and growth pattern of each tree species, the tree trimmers remove sufficient material from the tree to limit the possibility of contact during high wind situations. The CPS service area is split into three areas for tree trimming as follows:

- Year 1 - Thornbury and Collingwood West
- Year 2 - Collingwood East
- Year 3 - Stayner and Creemore

This scheduled tree trimming cycle is designed to minimize the number of vegetation caused outages throughout the system. This work may be carried out by CPS employees or contractors, based on cost and availability of resources.

All debris is removed and the site is returned to as-found condition. Any pole line damage or anomaly noticed by the tree trimming crew is reported to the Operation Manager of CPS for remedial action.

7.5 Conductor Capital

In a recent report released by ESA, concerns have been raised with the possibility of failure of older small conductors, due to aging, stretching and a general weakening, under certain installation conditions. The report does not identify these conditions; however, it does recommend the elimination of #6 Copper as a primary conductor and suggests replacement of other small conductors, such as #4 ACSR and #2 ACSR.

CPS currently maintains several kilometres of #2, #4 and #6 Copper. CPS has placed a priority on the replacement of the Copper conductor; this is included in the 5-year plan found in Section 10 of this report. Wherever possible this work will be done in conjunction with pole replacement in the same area.

A rise in demand from a larger customer in Stayner is nearing the accepted ampacity of the primary conductor feeding the facility. This primary feeder will be replaced with larger conductor and has been included in Section 10 of this report.

The pockets of 5kV underground cable which currently exist in Collingwood are scheduled for replacement in the next five years. This replacement will be done in conjunction with other required adjacent work such as the removal and replacement of live front transformers and poletran units.

8.0 Metering and Monitoring

CPS currently bills customers as follows:

- Electric heat and commercial – monthly
- Residential – monthly

8.1 Wholesale

CPS Inc. receives its power from Hydro One, either as 44kV subtransmission or 8.32kV Distribution voltages. Both are metered as the systems enter town.

8.2 Retail Metering

The CPS customer information is summarized in Table 1. CPS utilizes Elster/Olameter to provide remote meter reading services for the newly installed smart meters and Utilismart provides meter reading services for large customers. Savage Inc. is the Meter Service Provider (MSP).

8.3 Smart Meters

CPS completed the installation of smart meters throughout the service territory in December 2010. At the end of May 2011 all installed smart meters were registered with the Meter Data Management and Repository ("MDM/R"). Time of use ("TOU") billing began January 1, 2012. Throughout the installation and up to registration with the MDM/R CPS experienced issues with the quality of the meters procured which required the replacement of 839, representing a failure and replacement rate of 5.22% of the total population of installed smart meters.

With smart meters containing not only metrology but also communications and computer technology it can reasonably be assumed that the communications and computer portion of the meters will become obsolete prior to the metrology failing causing the replacement of meters which, from a metrology standpoint, are functioning normally. This is the issue which is currently being experienced with the Sensus iCon F and iCon G model smart meters. The meters, from a metrology standpoint, are accurate. The communications portion of the meter has however become obsolete. CPS has 4,631 Sensus iCon F and iCon G model smart meters which have issues with encryption. Installing encryption on Sensus iCon smart meters is a requirement as a result of the security audit completed in 2012. The 4,631 Sensus iCon F and iCon G model smart meters will need to be replaced with encryption compatible Sensus iCon smart meters.

The chart below shows the proposed customer growth forecasted for CPS, as included in the 2012 Cost of Service ("COS") application.

Table 12 – Customer Growth Forecast

Year	Residential	GS < 50kW
2012	320	26
2013	328	26
2014	335	27
2015	343	27
2016	351	28
2017	359	28

8.4 Inspection

All maintenance activities related to meters follow the requirements of Measurement Canada guidelines.

8.5 Meter Capital

CPS has prepared a budget that should complement its load growth over the next five years. The budget also accounts for an expected number of failures among smart meters each year. Refer to Section 10 for details.

9.0 Equipment

9.1 Transportation Equipment

Transport equipment is a necessity for operation of a distribution system. This requires that vehicles be acquired and maintained. CPS uses pickup trucks for transport of crew, tools and lighter materials to and from job sites. These pickups are replaced approximately every 8-10 years to ensure safety and reliability remains high. In addition to pickups CPS operates a number of larger Service Trucks. In accordance with standard utility practices these large trucks and trailers have an approximate 10-13 year life span based on individual usage. The replacement of each specific vehicle is based on its utilization, condition and overall maintenance costs.

9.2 Tools

The tools required for system construction and maintenance wear out during use and must be replaced. The replacement cost of tools varies; tools are replaced based on CPS experience, historical records and wear and tear of each tool.

9.3 IT Projects

CPS continues to maintain and improve upon its existing computer, network and telecom technology, consistent with industry requirements. For example in 2013 CPS will continue the development of the server virtualization project, which has already resulted in significant reductions in electricity usage and cooling costs. Industry experience has demonstrated that virtualization of the IT environment results in greater functionality and flexibility of a constantly changing environment, resulting in a lower cost of ownership, both short and long term.

9.4 Miscellaneous Office/Admin

Office supplies and administrative equipment is required to run CPS from day to day.

9.5 GIS Projects

CPS continues to maintain and update all of its assets using its Geographical Information System (GIS) to collect and display this information. The yearly budget for GIS at CPS covers off annual licensing for software and provides funding for hardware replacements and GIS projects as they arise. As stated in Section 2.3, CPS will be concentrating on collecting transformer information in the coming years.

9.6 CIS/General Accounting

CPS will be moving to a new version of Microsoft Dynamics GP accounting package which is hosted and shared with the Town of Collingwood. We continue to leverage our membership in the UCS Group which hosts our Harris NorthStar electricity, water and sewer billing system. This system is shared with other UCS Group members to maintain consistency and keep costs down. We will be upgrading our web based customer e-billing portal which will provide our customers with a more integrated look at their bills and time of use data.

9.7 Equipment Capital

Several pickups and two bucket trucks are included in the 5-year plan found in Section 10. Due to their high cost, purchase of bucket trucks is typically spread out over a two year period. The chassis is purchased the first year and the remaining portion of the truck is paid for the second year, when delivery is taken.

To cover all tool replacements during the course of a year, a set amount of capital is included in Section 10 of this report.

The next GIS project which will be pushed forward in the collection and recording of all available transformer information in the field. This will be a time consuming process requiring a bucket truck and will be done in conjunction with other maintenance or capital work wherever possible. The cost of this project, along with that of the software itself, is included in Section 10.

The capital cost of any Miscellaneous Office/Admin equipment is included in Section 10.

10.0 Capital Forecast Plan

CPS recognizes the need to address the aging assets. With better information in the near future, an appropriate plan for replacement will be prepared. Closer monitoring and coordination within CPS's distribution area regarding expansion plans will allow CPS to better track asset replacement requirements.

Plant expansion driven by new customers; main capital activity based on plant replacement

The following chart summarizes the 5 year plan:

Table 13 – Capital Expenses

DESCRIPTION	2012	2013	2014	2015	2016
Substation	**$40,000**	**$595,000**	**$1,740,000**	**$40,000**	**$40,000**
Station Equipment	$0	$0	$1,700,000	$0	$0
SCADA	$40,000	$40,000	$40,000	$40,000	$40,000
Land	$0	$550,000	$0	$0	$0
Poles, Towers and Fixtures	**$608,422**	**$601,730**	**$709,255**	**$748,538**	**$954,674**
New Construction	$152,672	$0	$0	$0	$0
Line Improvements	$455,750	$601,730	$709,255	$748,538	$954,674
Overhead Conductor and Devices	**$373,843**	**$133,081**	**$101,552**	**$188,689**	**$160,177**
Primary Conductor	**$191,059**	**$96,405**	**$90,432**	**$145,388**	**$104,405**
New Construction	$160,629	$0	$0	$0	$0
Line Improvements	$30,430	$96,405	$90,432	$145,388	$104,405
Secondary Conductor	**$7,784**	**$11,676**	**$11,120**	**$43,301**	**$55,772**
New Construction	$0	$0	$0	$0	$0
Line Improvements	$7,784	$11,676	$11,120	$43,301	$55,772
Overhead Equipment	**$175,000**	**$25,000**	**$0**	**$0**	**$0**
New Construction	$150,000	$0	$0	$0	$0
Line Improvements	$25,000	$25,000	$0	$0	$0
Line Transformer	**$118,564**	**$181,636**	**$282,200**	**$308,328**	**$269,768**
Underground Transformer	**$26,404**	**$125,444**	**$148,252**	**$82,792**	**$114,040**
New Construction	$0	$0	$0	$0	$0
Line Improvements	$26,404	$125,444	$148,252	$82,792	$114,040
Overhead Transformer	**$92,160**	**$56,192**	**$133,948**	**$225,536**	**$155,728**
New Construction	$0	$0	$0	$0	$0
Line Improvements	$83,736	$56,192	$133,948	$197,696	$155,728
Underground Conductor and Devices	**$74,879**	**$263,210**	**$227,494**	**$65,485**	**$235,391**
Underground Primary Conductor	**$55,379**	**$163,310**	**$113,044**	**$52,285**	**$144,791**
New Construction	$0	$0	$0	$0	$0
Line Improvements	$55,379	$163,310	$113,044	$52,285	$144,791
Underground Equipment	**$0**	**$0**	**$60,000**	**$0**	**$0**
New Construction	$0	$0	$0	$0	$0
Line Improvements	$0	$0	$60,000	$0	$0

Trenching	**$19,500**	**$99,900**	**$54,450**	**$13,200**	**$90,600**
New Construction	$0	$0	$0	$0	$0
Line Improvements	$19,500	$99,900	$54,450	$13,200	$90,600
Meters	**$275,500**	**$275,500**	**$275,500**	**$109,250**	**$109,250**
New Construction	$0	$0	$0	$0	$0
Line Improvements	$275,500	$275,500	$275,500	$109,250	$109,250
Services	**$150,000**	**$150,000**	**$150,000**	**$150,000**	**$150,000**
OH and UG new services	$150,000	$150,000	$150,000	$150,000	$150,000
Other	**$382,000**	**$505,000**	**$240,000**	**$505,000**	**$180,000**
Vehicles and Equipment	$202,000	$325,000	$60,000	$325,000	$0
Tools	$75,000	$75,000	$75,000	$75,000	$75,000
Computer Hardware and Software	$105,000	$105,000	$105,000	$105,000	$105,000
TOTAL	**$2,023,208**	**$2,705,157**	**$3,726,001**	**$2,1157,290**	**$2,099,261**

Table 14 – Operating Expenses

DESCRIPTION	2013	2014	2015	2016	2017
Operation Supervision and Engineering	$151,249	$157,299	$163,591	$170,135	$176,940
Load Dispatching	$50,907	$52,943	$55,061	$57,263	$59,554
Station Buildings and Fixtures Expense	$24,419	$25,396	$26,412	$27,468	$28,567
Overhead Distribution Lines and Feeders - Operation Labour	$33,186	$34,513	$35,894	$37,330	$38,823
Overhead Distribution Lines and Feeders - Operation Supplies and Expenses	$24,233	$25,202	$26,210	$27,259	$28,349
Overhead Distribution Transformers- Operation	$26,417	$27,474	$28,573	$29,716	$30,904
Underground Distribution Lines and Feeders - Operation Labour	$6,489	$6,749	$7,019	$7,299	$7,591
Underground Distribution Lines and Feeders - Operation Supplies and Expenses	$4,483	$4,662	$4,849	$5,043	$5,244
Underground Distribution Transformers - Operation	$5,794	$6,026	$6,267	$6,517	$6,778
Meter Expense	$4,754	$4,944	$5,142	$5,348	$5,562
Miscellaneous Distribution Expense	$50,691	$52,719	$54,827	$57,020	$59,301
TOTAL OPERATION EXPENSES	**$382,622**	**$397,927**	**$413,844**	**$430,398**	**$447,614**

Table 15 – Maintenance Expenses

DESCRIPTION	2013	2014	2015	2016	2017
Maintenance Supervision and Engineering	$154,139	$160,305	$166,717	$173,385	$180,321
Maintenance of Buildings and Fixtures - Distribution Stations	$10,394	$10,810	$11,242	$11,692	$12,160
Maintenance of Distribution Station Equipment	$46,776	$48,647	$50,593	$52,617	$54,721
Maintenance of Poles, Towers and Fixtures	$166,229	$172,878	$179,793	$186,985	$194,464
Maintenance of Overhead Conductors and Devices	$332,468	$345,767	$359,597	$373,981	$388,941
Maintenance of Overhead Services	$176,526	$183,587	$190,931	$198,568	$206,510
Overhead Distribution Lines and Feeders - Right of Way	$176,617	$183,682	$191,029	$198,670	$206,617
Maintenance of Underground Conductors and Devices	$120,788	$125,620	$130,644	$135,870	$141,305
Maintenance of Underground Services	$241,621	$251,286	$261,337	$271,791	$282,662
Maintenance of Line Transformers	$67,919	$70,636	$73,461	$76,400	$79,456
Maintenance of Meters	$245,678	$255,505	$265,725	$276,354	$287,409
TOTAL MAINTENANCE EXPENSES	**$1,739,155**	**$1,808,721**	**$1,881,070**	**$1,956,313**	**$2,034,565**

CPS is able to forecast their needs for 2013 and 2014 with greater accuracy. The following sections describe the works to be completed in more detail.

10.1 Capital Expense 2013 - Details

10.1.1 Distribution Station Equipment

Creemore MS CPS will purchase land for the planned Creemore MS in 2013 along with preliminary feeder revisions to accommodate the proposed station construction in 2014	$555,000
Total Budget	**$555,000**

10.1.2 44kV Feeders

Tenth Line – Poplar Sideroad to Mountain Road - New 44kv relocation of M7 feeder The construction of a new 44 kV line from Poplar Sideroad to Mountain Road is a result of undersized copper conductor currently on the M7 feeder north of Mountain Road and the replacement of the IESO Wholesale Metering PME location. This project has been divided into two phases. The first phase will include 52 new poles carrying approximately 3076 meters of both 4kV (existing) and 44kV conductor. In addition, the build will include 2 new 44kV switches.	$363,301
Hurontario Street South Project A new 44kV switch will be installed closer to the demarcation point or the CPS service territory.	$25,000
Total Budget	**$388,301**

10.1.3 Distribution Lines Overhead

This account includes Poles, Towers, Fixtures, Conductors and Devices. It covers all the overhead work scheduled to be completed on the 4.16kV and 8.32kV distribution systems.

Simcoe Street Rebuild – Peel Street to Raglan Street - Collingwood The rebuild of Simcoe Street will involved the replacement of undersized #4 and #6 copper conductor. This project includes replacement of 22 poles, and 700 meters of new conductor. Using the new construction designs and increasing the conductor and pole size will eliminate potential safety hazards and decrease line losses.	**$122,766**
Hurontario Street South Project This project will replace and reconstruct approximately 15 aging suspect poles from Poplar Sideroad to Campbell Street. The existing 4kv and 44kv conductor will be utilized. This project will address potential safety concerns.	**$97,120**
Annual Pole Replacements As regular yearly maintenance, CPS will continue to replace one off poles that are suspect in nature due to their species, age or condition. It is estimated that 50 poles a year will be changed out and replaced. This is in addition to the ongoing reconstruction projects that have been identified that address suspect poles as part of a reconstruction or rebuild.	**$246,800**
Annual Road Authority Projects From time to time municipal projects arise where hydro plant needs to be reposition, rebuild and reconstructed. This is an annual allotted budget to provide the funds for such situations.	**$52,278**
Total Budget	**$431,564**

10.1.4 Distribution Lines Underground

Unlike the overhead construction, underground installations are totally dependent on new development throughout the Town. A Developer may forecast on the installation of 100 lots, and only construct 50 because of sales, or they want to construct additional lots at the end of the year for economical reason's. The following was made with the best data available at the time.

Ronell Crescent Project (industrial area) - Replacement of 325 meters of 5kV rated UG Conductor.	$64,989
Annual Road Authority Projects From time to time municipal projects arise where hydro plant needs to be reposition, rebuild and reconstructed. This is an annual allotted budget to provide the funds for such situations.	$9,890
CPS Total Budget	**$74,879**

10.1.5 Distribution Transformers

This account is similar to the underground distribution account, as its dependent on the activities of Developers. Again our best guess at the time is shown below.

Simcoe Street Rebuild – Peel Street to Raglan Street - Collingwood During the rebuild of Simcoe Street 4 pole mounted transformers will be replaced.	$17,344
Hurontario Street South Project This project will replace 3 pole mount transformers.	$18,624
Pole Replacements 2013 As regular yearly maintenance, CPS will continue to replace transformers when replacing one off poles that are suspect in nature due to their species, age or condition.	$43,360
Annual Road Authority Projects From time to time municipal projects arise where hydro plant needs to be reposition, rebuild and reconstructed. This is an annual allotted budget to provide the funds for such situations.	$12,832
Ronell Crescent Project (industrial area) - Replacement of 1 live front transformer is included in this project.	$26,404
CPS Total Budget	**$118,564**

10.1.6 Distribution Meters

Annual Meter Replacements CPS currently replaces approximately 600 meters per year as part of an ongoing maintenance program.	$109,250
Annual Meter Failures CPS currently replaces approximately 11% of its meters annually.	$166,250
Tenth Line – Poplar Sideroad to Mountain Road - New 44kv relocation of M7 feeder The construction of a new 44 kV line from Poplar Sideroad to Mountain Road will include 1 new wholesale metering PME.	$100,000
Total Budget	**$375,500**

10.2 Capital Expense 2014 - Details

10.2.1 Distribution Station Equipment

Creemore MS CPS will construct a station in Creemore during 2014	$1,700,000
Total Budget	**$1,700,000**

10.2.2 44kV Feeders

Mountain Road from Tenth line to MS2- New 44kv relocation of M7 feeder The second phase of the project begun in 2013 will be a rebuild of the existing hydro plant on Mountain Road from Tenth Line to MS2. The phase will replace and upgrade approximately 25 poles, and 1050 meters of 4kV and 44kV conductor. One additional 44kV switch will be needed for this phase. Once completed, CPS will have a reliable appropriately sized tie between the 44KV metering point at the corner of Poplar Sideroad and Tenth Line and MS2.	$342,007
Total Budget	**$342,007**

10.2.3 Distribution Lines Overhead

This account includes Poles, Towers, Fixtures, Conductors and Devices. It covers all the overhead work scheduled to be completed on the 4.16kV and 8.32kV distribution systems.

MS1 to Highway 26 (Stayner) Part 1 Replace 30 poles and approximately 1100 meters of new conductor	$118,576
Annual Pole Replacements As regular yearly maintenance, CPS will continue to replace one off poles that are suspect in nature due to their species, age or condition. It is estimated that 50 poles a year will be changed out and replaced. This is in addition to the ongoing reconstruction projects that have been identified that address suspect poles as part of a reconstruction or rebuild.	$246,800
Annual Road Authority Projects From time to time municipal projects arise where hydro plant needs to be reposition, rebuild and reconstructed. This is an annual allotted budget to provide the funds for such situations.	$52,278
Total Budget	**$417,654**

10.2.4 Distribution Lines Underground

Unlike the overhead construction, underground installations are totally dependent on new development throughout the Town. A Developer may forecast on the installation of 100 lots, and only construct 50 because of sales, or they want to construct additional lots at the end of the year for economical reason's. The following was made with the best data available at the time.

CPS currently has several areas where underrated (5kV) conductor and poletrans transformers exist. These areas have been subdivided into different projects. All of these projects take place in residential areas and will address potential safety and system reliability

Griffin Road Project - Replacement of 250 meters of 5kV rated UG conductor	$37,430
Seventh Street Project- Replacement of 110 meters of 5kV rated UG conductor	$16,493
Spruce Street – Seventh Street to Griffin Road Project - Replacement of 290 meters of 5kV rated UG conductor	$43,155
Gibbard Crescent North Project - Replacement of 375 meters of 5kV rated UG conductor	$55,945
Gibbard Crescent South Project - Replacement of 550 meters of 5kV rated UG conductor	$82,466
Second Street Project (Between back lanes) This project will replace an existing under sized #4 copper overhead line and move it underground. This is the final portion of an existing community improvement project for the downtown core.	$17,831
Annual Road Authority Projects From time to time municipal projects arise where hydro plant needs to be reposition, rebuild and reconstructed. This is an annual allotted budget to provide the funds for such situations.	$9,890
CPS Total Budget	**$248,360**

10.2.5 Distribution Transformers

This account is similar to the underground distribution account, as its dependent on the activities of Developers. Again our best guess at the time is shown below.

Griffin Road Project Will include the replacement of 2 poletran units.	$22,808
Seventh Street Project Will include the replacement of 1 poletran unit.	$11,404
Spruce Street – Seventh Street to Griffin Road Project Will include the replacement of 1 poletran unit.	$11,404
Gibbard Crescent North Project Will include the replacement of 2 poletran units.	$22,808
Gibbard Crescent South Project Will include the replacement of 5 poletran units.	$57,620
Pole Replacements 2013 As regular yearly maintenance, CPS will continue to replace transformers when replacing one off poles that are suspect in nature due to their species, age or condition.	$43,404
Annual Road Authority Projects From time to time municipal projects arise where hydro plant needs to be reposition, rebuild and reconstructed. This is an annual allotted budget to provide the funds for such situations.	$12,832
Total Budget	**$182,280**

10.2.6 Distribution Meters

Annual Meter Replacements CPS currently replaces approximately 600 meters per year as part of an ongoing maintenance program.	$109,250
Annual Meter Failures CPS currently replaces approximately 11% of its meters annually.	$166,250
Total Budget	**$275,500**

11.0 Information Systems

CPS has identified the need for better information systems to address the current and future requirements, related to preparation of asset management plans, assessment of distributed generation project impacts on the existing system and development of a smart grid strategy in response to the Green Energy Act. It is anticipated, that additional drivers are likely to present themselves in the future to further support the need for these systems. The need for these systems is described in more detail below.

11.1 Analysis

CPS currently uses a combination of staff and contract services to assess system losses and to calculate system protection coordination studies. This process is further enhanced and supported by the implementation of an asset management system or a GIS.

System studies include protection coordination, system loss calculation, conductor sizing, voltage drop, system loading and arc flash protection. CPS performs system optimization and load balancing studies on a periodic basis. These analyses are conducted to address the reliable operation of the distribution system.

It is important to CPS to have the ability to analyze system changes and impacts due to customer demands, on a timely basis. This is even more important when considering the requirements related to the DAT and CIA, needed to respond on a timely basis to customer driven FIT and micro-FIT projects.

11.2 Asset Management System (GIS) Implementation

The utility asset information is maintained in a central repository, representing a single source of truth for the organization. This information is being further integrated across all functions, thus linking engineering, operational and financial information for all assets. This is further enhanced by a network connectivity model, which more accurately represents the impact of assets on one another.

The asset management model implemented by CPS allows linking of the available smart meter data with a system model, thus providing a better foundation for the calculation of CPS asset data health indices as well as providing the foundation for the potential calculation of feeder health indices.

As mentioned, the model would also be a foundation for system analysis studies, which will be essential for addressing FIT and microFIT applications and assessing their potential impacts on the CPS distribution system.

11.3 International Financial Reporting

The implementation of the IFRS reporting system is required by January 1, 2014. This will impact current processes, in particular as they apply to the installation, maintenance and disposal costs of major assets, such as poles, transformers and station equipment. It is expected that the asset management system to be implemented may support this requirement.

11.4 SCADA

The CPS distribution system is relatively compact. The response to trouble calls and outages is within industry norms, as is evidenced by the performance indicators in Section 2.2.2. The need for remote control of switching equipment at this time is minimal. However, as systems become more complex due to distributed generation requirements, system control and operation will also become more complex and the supporting systems will need to be sophisticated enough to support these operational needs.

CPS has implemented a flexible and expandable system, based initially on system monitoring, with the ability to evolve and support remote operation functions. The system monitoring will support and collaborate with the smart meter data to provide CPS with better system level information and allow more accurate system analysis studies.

12.0 Summary

In summary, the inherited part of the CPS system is older and will require replacement over the next several years. In order to prepare a technically sound and economically viable plan, CPS will require collecting additional information on asset characteristics and asset condition. This data will be stored in CPS's GIS system, a central database that allows correlation with financial, customer and operational systems. This will also facilitate improved analysis of corporate information and allow for timely information and decisions.

The following observations can be made:

- Improved information systems are required
- Inspection results should be recorded electronically, to allow correlation with asset characteristics
- Correlate outage and system performance information with asset condition and maintenance information to provide a solid foundation for 5 year capital and maintenance budget plans
- CPS will have the ability to review current maintenance standards, based on more complete asset data combined with inspection and asset condition information, and adjust current maintenance standards for each asset type.
- The Capital Project Plan has primarily been driven by a structured project prioritization process based on corporate values, such as safety, reliability, environment and financial performance, to name a few.

APPENDIX A

APPENDIX B