REFERENCE:

Appendix 7.7, page 16 to 19

PREAMBLE TO IR (IF ANY):

QUESTION:

a) For all Programs with annual spending over $5 million in the test years, please provide detailed explanation and documentation for the following:
    i. Complete scope of program activities
    ii. Forecast methodologies including supporting data and assumptions
    iii. Standard alternatives considered prior to capital replacement
    iv. Decision criteria for capital replacement
    v. Approval process for capital replacement, and spending authority assigned to each level of approval
b) To the extent that Capital Project Justifications (CPJ), including any revisions or addendums, and Project Value Summary Reports exist for capital Programs, please file those documents for all capital Programs over $5 in the test years. If analogous documentation, under a different name exists for capital Programming, please file those documents

RESPONSE:

a) Item v. regarding the approval process for capital replacement, and spending authority is consistent for all programs and will be addressed first. The other items (i. through iv.) will be addressed below within each specific program.

    Prior to the execution of program items, a program is approved similar to a project as detailed in Tab 7, section 7.4. Once the program has been approved, the approval process and spending authority for program items is as follows:

- Program items up to $300k are approved by Section Head or Delegate (determined by the Department Manager responsible for the program) Program items between $300k to $1,000k are approved by the Department Manager responsible for the program
- Program items above $1,000k are converted into a project unless otherwise specified and will follow the project approval guidelines.

System Renewal

1. Overhead Pole & Feeder Replacements

(Projected spend - 2022/23 - $26.1M, 2023/24 - $26.6M, & 2024/25 - $27.1M)

i. The scope of work for the Overhead Pole & Feeder Replacements program addresses the replacement of sections of overhead distribution assets that may include:
   - Poles and attachment
   - Overhead conductors
   - Overhead transformers
   - And 66 kV Insulators

   This program also includes work to reinforce poles using engineered steel products in instances where the remainder of the pole is found to be in serviceable condition.

   Poles that have been reported damaged or require replacement for operational reasons are replaced within other programs or projects.

ii. The program expenditure forecast is based on historical rolling average actual expenditures that considers identified failures, workforce availability, and material availability. Currently, this program is limited mainly by the workforce availability as asset requirements are increasing (refer to Appendix 7.5 for more details) and this work is lower priority in comparison to customer requests.

iii. Life extension activities for these assets are undertaken in other programs such as the IPM pole treatment program (see Program 4 below). Efforts are made to repair/maintain assets where practicable but if replacement is deemed necessary, they are identified for this program.

iv. This program's capital expenditures are undertaken when existing assets, which are still required to serve, are at end of life, failed, no longer operating at required levels, and/or beyond maintenance interventions.

2. Distribution Modifications – Small Scope

(Projected spend - 2022/23 - $12.8M, 2023/24 - $13.1M, & 2024/25 - $13.3M)

i. The scope of work for the Distribution Modifications – Small Scope program includes Class A and Class B Customer Service Orders (minor modifications to the distribution system) for both system improvement and customer service driven work to:
   - Replace serialized equipment that has failed in service
   - Salvage redundant or out of service assets
   - Replace farm metering units
   - Add or modify assets to address joint use attachment requests received via Joint Use Permits
   - Add or modify distribution feeder protection equipment
   - Improve the distribution system to respond to customer requests.

   This program does not include customer requests for new electric service for residential, commercial, or industrial load.

ii. The program expenditure forecast is based on a historical rolling average of actual expenditures.

iii. The Customer Service Centers respond to asset needs based on field inspections, technical reports/memos, and customer requests. Due to the immediate requirement to maintain system operation, there are no standard alternatives considered prior to capital replacement (ex. a customer transformer failure would necessitate immediate replacement to restore service).

iv. As stated above, this work is required and determined by field staff based on failures or deficiencies identified during field inspections or reported by a customer.

3. Lighting – Standards, Base & Cable Replacement

(Projected spend - 2022/23 - $9.0M, 2023/24 - $9.5M, & 2024/25 - $10.0M)

i. The scope of work for the Lighting – Standards, Base and Cable Replacement program includes the replacement of:
   - Light standard, pole mounting arm
   - Bases
   - Cable or Conductor
   - Enclosed lamp fitting to carry replaceable bulbs and control wiring.

   Replacement of bulbs is not included in this program unless the entire street light standard unit has collapsed because of damage (ex. accident or equipment contact) or deteriorated condition/obsolescence of the lamp fitting. Bulbs are normally replaced as part of operating programs to replace failed bulbs or as part of group bulb replacement programs.

ii. The program expenditure forecast is based on historical rolling average actual expenditures that consider identified failures, workforce availability, and material availability.

iii. In accordance with the inspection program, the assets are monitored, repaired, or replaced based on risk.

iv. Criteria used for determining if capital replacement is required are:
   - Assets have failed, or failure is deemed to be imminent
   - Asset condition/deficiencies are beyond repair (ex. due to corrosion, dents, broken welds, exposed anchor bolt, damaged base, leaning, poor condition of the insulation of the streetlight cables, etc.)

4. Overhead – IPM Pole Treatment

(Projected spend - 2022/23 - $8.3, 2023/24 - $8.5M, & 2024/25 - $8.7M)

i. The IPM Pole Treatment Program covers remedial treatments for distribution wood poles that are considered serviceable and would receive treatment on a 12-15 year cycle following installation. Remediation is designed to provide specific pole types with added internal and external protection to extend their service life. Some of the tasks within the Pole Treatment program include:

- Collecting data on specific details of the pole
- Field Inspections on condition of the poles
- Completing a mitigation method based upon the condition of the pole (treat, reinforcement, or flag for replacement)

ii. The program expenditure forecasts are based upon the total costs required to run the pole treatment program which includes visiting, inspecting, and completing the mitigation method for total pole population over a 12-year period.

iii. Inspecting, treating and monitoring of poles is conducted until replacement is required.

iv. Field inspections determine the condition of the poles and whether treatment, reinforcement, or replacement is needed. Examples of deficiencies are dry rot, pole is leaning, or pole needs to be relocated due to environmental conditions.

5. Underground – Cable Replacement

(Projected spend - 2022/23 - $7.4M, 2023/24 - $7.6M, & 2024/25 - $7.8M)

i. The scope of work for the Underground Cable Replacement program is to replace cable that has either:
   - Been inspected and/or assessed for operational performance and found to be in poor condition with a high failure risk within one to two years, or
   - Has faulted and poses a high risk of re-failure.

ii. The program expenditure forecast is based on historical rolling average actual expenditures that consider identified failures, workforce availability, and material availability.

iii. The standard alternatives considered prior to replacement are:
   - Cable failures can be repaired (splicing out damaged sections of cable), or
   - The cable is flagged for the injection program (See Program 6 below)

iv. The decision for capital replacement is based on the assessment that the cable cannot be repaired due to the location of failures, total number of failures and/or condition of the insulation.

6. Underground – Cable Injection

(Projected spend - 2022/23 - $4.0M, 2023/24 - $4.5M, & 2024/25 - $5.0M)

i. The scope of work for the Underground Cable Injection program includes the injection of a di-electric (silicone) fluid into power cable strands of medium voltage Cross Linked Polyethylene (XLPE) cables primarily used to provide service to residential subdivisions. Cables selected for injection may also require replacement of elbows and other component parts.

ii. The program expenditure forecast is based on historical rolling average actual expenditures that consider identified failures, workforce availability, and material availability. Age, type of cable and inspection results are used to determine eligibility and timing of cable injection.

iii. The cable injection program is the standard alternative considered prior to replacement (See Program 5) as the injection program is known to extend the lifespan of the cable at a fraction of the cost of replacing.

iv. Assets included in this program are identified based on historical failure rates, insulation with degraded condition, and cable vintage at its estimated end of life.

<u>Customer Connections</u>

7. Overhead & Underground Connects – Small Scope

(Projected spend - 2022/23 - $16.0M, 2023/24 - $16.3M, & 2024/25 - $16.6M)

i. The scope of work for Overhead & Underground Connects – Small Scope includes Class A and Class B Customer Service Orders (minor modifications to the distribution system), representing investments to respond to customer requested electric service for residential, commercial, and industrial load.

ii. The program expenditure forecast is based on a historical rolling average actual expenditures that take into consideration average customer requests. Requests from customers are considered priority and resources are allocated accordingly.

iii. Program items are based on signed customer agreements that are required to be completed due to policy thus no alternatives are available.

iv. The decision criteria to complete requests are whether a signed customer agreement and customer contribution payment (based on policy) has been received.

8. Commercial Services – Winnipeg

(Projected spend - 2022/23 - $9.2M, 2023/24 - $9.3M, & 2024/25 - $9.5M)

i. The scope of work for commercial service investments inside the City of Winnipeg may include:
   - 66kV supply to large customers
   - Distribution primary supply
   - Underground supply to pad-mounted transformation
   - Overhead supply to pole-mounted transformation

   Feeder extensions necessary to reach the customer's property and minor modifications to the electric network, such as protective device upgrades, may also be required.

ii. The program expenditure forecast is based on a historical rolling average actual expenditures that take into consideration average customer requests. Requests from customers are considered priority and resources are allocated accordingly.

iii. Program items are based on signed customer agreements that are required to be completed due to policy thus no alternatives are available.

iv. The decision criteria to complete requests are whether a signed customer agreement and customer contribution payment (based on policy) has been received.

9. Commercial Services – Rural

(Projected spend - 2022/23 - $7.1M, 2023/24 - $7.2M, & 2024/25 - $7.4M)

i. The scope of work for commercial service investments outside the City of Winnipeg may include:
   - 66kV supply to large customers
   - Distribution primary supply
   - Underground supply to pad-mounted transformation
   - Overhead supply to pole-mounted transformation

   Feeder extensions necessary to reach the customer's property and minor modifications to the electric network, such as protective device upgrades, may also be required.

ii. The program expenditure forecast is based on a historical rolling average actual expenditures that take into consideration average customer requests. Requests from customers are considered priority and resources are allocated accordingly.

iii. Program items are based on signed customer agreements that are required to be completed due to policy thus no alternatives are available.

iv. The decision criteria to complete requests are whether a signed customer agreement and customer contribution payment (based on policy) has been received.

10. Electric Meters

(Projected spend - 2022/23 - $6.0M, 2023/24 - $6.2M, & 2024/25 - $6.3M)

i. The scope of work for the Electric Meters program includes:
   - Metering additions to serve new customers
   - A meter exchange program which consists of replacing seal-expiring meters (prior to the seal expiry), defective meters, or meters recalled by Measurement Canada
   - A meter sampling program as defined by Measurement Canada

ii. The program expenditure forecasts are based on projected/historical costs of purchasing and installing new meters required by new and existing customers along with the total projected/historical costs required to operate the sampling program. Meters are replaced based on seal expiry and the sampling program. Measurement Canada allows certain meters to be re-inspected and the expiry period extended.

iii. There are no alternatives to this infrastructure.

iv. The decision criteria for capital replacement are based on Measurement Canada Standards (i.e., SS-06) which determine the timing of replacements.

Fleet

11. Fleet Acquisitions

(Projected spend - 2022/23 - $23.0M, 2023/24 - $23.9M, & 2024/25 - $24.4M)

i. The scope of work for Fleet Acquisitions includes upgrades to equipment or vehicles; replacement of equipment or vehicles nearing or past their useful life; replacement or purchase of equipment or vehicles to meet equipment specifications or business needs; fleet vehicle or vehicle-related technologies that contribute to efficient operations and safety; disposal or sale of retired or surplus vehicles and equipment. This includes, but is not limited to:
   - Diggers
   - Forklifts
   - Light and Medium Duty Trucks
   - Aerial ladders
   - Trailers
   - Boats
   - Snowmobile/ quads

ii. Forecast is established based on Fleet Services recommendations for equipment and vehicles for upgrades, maintenance, or replacement in accordance with:
   - Equipment and vehicle specifications
   - Equipment and vehicle replacement schedules
   - The existing inventory of acquired vehicles and equipment
   - Reassigning, replacing, or disposing of vehicles and equipment

iii. Standardization of units provides opportunities for redeployment of fleet units with high use to low use areas to optimize value. Fleet Services uses Copperleaf's C55 Analytics module to plan fleet investments, which includes the ability to prioritize investments. This may result in deferring replacement of others.

iv. Criteria for determining replacement includes vehicle criticality, usage, economics (increased maintenance costs), and assessment of vehicle health through inspections.

Corporate Facilities

12. Facilities Capital Upgrade

(Projected spend - 2022/23 - $8.0M, 2023/24 - $8.2M, & 2024/25 - $8.3M)

i. The scope of work for corporate facilities includes repairs, upgrades, replacements or additions to the corporation's approximately 140 buildings that are managed by the Corporate Facilities & Security Department. These buildings typically accommodate administrative staff (ex. 360 Portage Avenue Head Office) and exclude other specialty buildings (ex. generating stations) that are maintained by other areas of the corporation. Investments include:
   - Roof repair or replacements
   - HVAC repair or replacements
   - Plumbing or cooling system repair or replacements
   - Office renovations
   - Construction of a new smaller building

ii. The Corporate Facilities & Security Department uses VFA Facility Condition Assessment services to monitor asset condition and forecast investment requirements. The system works as follows:
   - Facility assets are modeled down to the sub-system level, where building components (roof, boilers, doors, etc.) are described using their replacement value and remaining service life
   - Facility component data is updated as required and audited on a five-year cycle by third-party condition assessors.
   - VFA Capital Planning software provides forecasting tools to provide budgeting scenarios based on the Facility Condition Index (FCI) methodology. This results in a projected capital investment requirement based on FCI targets for various facilities.

iii. FCI targets are established for each facility asset based on its criticality. For low-priority assets with higher allowable FCI, renewal of non-critical components (such as interior finishes) may be deferred based on the prioritization scheme. In addition, maintenance strategies are balanced with capital renewal expectations to optimize overall life-cycle investment.

iv. VFA Condition Assessment software is the primary tool used to prioritize system renewals within this program with life-cycle cost used as the means for decision making by the Facilities management team.

Information Technology

13. Computing Infrastructure

(Projected spend - 2022/23 - $16.3M, 2023/24 - $12.9M, & 2024/25 - $11.8M)

i. Investments include additions, replacements, and upgrades to the corporation's computing infrastructure. Computing infrastructure can be broadly categorized as:
   - End Point Computing (ex. desktops, laptops, monitors, computer accessories)
   - Printers (ex. multifunctional devices, printer devices)
   - Desktop Software (ex. word processing software, spreadsheets, engineering tools, tax software)
   - Data Centre Infrastructure (ex. servers, networks, storage)

ii. The Computing Infrastructure program spend forecast is based on historical experience, industry best practices for asset replacement, assessment of cyber risk, and the age of existing equipment recognizing the size and volume of work may fluctuate annually based on various factors. Factors include newly identified needs that reflect stakeholder priorities, project schedule and technology dependencies (ex. coordinate infrastructure upgrade with an application upgrade), technological advances, expiration dates of existing maintenance contracts, or other financial incentives offered by manufacturers.

iii. There are no 'standard alternatives' considered with these types of investments. Alternatives are developed for each unique need and evaluated to determine which investment the corporation will proceed with.

Prior to replacement of computing infrastructure, the corporation considers maintenance strategies in alignment with technology obsolescence and cyber security risk. This would include applying software patches of software upgrades and/or upgrades to extend the lifecycle of infrastructure items.

iv. Decision criteria for replacement depends on the type of computing infrastructure, but generally includes:
   - Targeted replacement of equipment when beyond repair, no longer operate or meet functional needs
   - New desktop software or version upgrade results in the replacement/ retirement of existing software or hardware to meet existing and evolving needs identified by the various Operating and Corporate groups
   - Need to meet the corporation's requirement for printing, faxing, and scanning
   - Ensure Manitoba Hydro staff can work effectively

   IT Asset Management and Infrastructure Leads are responsible for identifying potential investments. Work will be executed based on assessed value, stakeholder priorities, resource availability and annual budget. Investments are approved by the Computing Infrastructure Program Owner or the Infrastructure and Operations Department Manager (or delegate).

14. Emerging Information Technology

(Projected spend - 2022/23 - $1.0M, 2023/24 - $5.0M, & 2024/25 - $5.0M)

i. Investments in the Emerging Information Technology program include the addition, replacement and upgrades of smaller systems with new functionality, development of interfaces between systems or analytical solutions that leverage enterprise data to support improved decision making or reporting requirements.
ii. The Emerging Information Technology program spend is forecasted based on historical spend and anticipated needs - recognizing the size and volume of work may fluctuate annually based on various factors which may include newly identified needs that reflect stakeholder priorities, project schedule and technology dependencies.
iii. There are no 'standard alternatives' considered with these types of investments. Alternatives are developed for each unique need and evaluated to determine which investment the corporation will proceed with.
iv. Prior to replacing an Emerging Information Technology system, the corporation considers maintenance strategies in alignment with technology obsolescence

and cyber security risk. This would include applying software patches of software upgrades.

Investments within this program are assessed individually, considering technology obsolescence, cyber security risk, improved decision support, and process efficiencies. Decision criteria will align to Corporate Value Framework assessments.

b) Please see the attachment to MIPUG/MH I-84 b) for the requested documents.

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Overhead - Pole & Feeder Replacements

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$17,800 to $29,000
CONTRIBUTIONS RANGE (ANNUAL):	$0 to $0
NET BUDGET RANGE (ANNUAL):	$17,800 to $29,000
	(values listed above are in thousands of dollars)
CORPORATE VALUE FRAMEWORK SCORE: (CVF scores reflect the Recommended alternative)	**Value:** 557,784 **Value/$K:** 1.74

DATE PREPARED: 2019/10/23

EC/MHEB APPROVAL MINUTE & DATE: Approved by Jay Grewal December 18, 2019

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Steele, Chuck	DIRECTOR OF ENGINEERING & CONSTRUCTION		Director - Engineering & Construction	2019/12/06
Braid, Kristin	DISTRIBUTION ASSET MANAGEMENT DEPT MGR		Planning, Protection & Asset Strategy	2019/12/05
Lawrie, Sarah	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2019/12/05
Cooke, Jim	CAPITAL PLANNING SECTION HEAD		Planning, Protection & Asset Strategy	2019/12/03

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Marketing & Customer Service	**REQUESTING OPERATING/CORPORATE GROUP:**	Marketing & Customer Service
RESPONSIBLE DIVISION:	Engineering & Construction	**REQUESTING DIVISION:**	Engineering & Construction
RESPONSIBLE DEPARTMENT:	Distribution Asset Management		
I.M. NODE NUMBER:	2.1.40.25.07.7	**W.B.S. NUMBERs:**	B:00457
C55 INVESTMENT CODE:	11797		
SAP PROJECT TYPE:	24 - BOC-Executive Committee	**C55 INVESTMENT SUB-CATEGORY**:	Common Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C3 / Sustainment (Level 2) CM / System Renewal		

CONTACTS			
PREPARED BY:	Cooke, Jim CAPITAL PLANNING SECTION HEAD 52465	**REQUESTOR:**	Kristin Braid
PROJECT MANAGER:	Shabaga, Jeff DIST ASSET STRATEGIES SECTION HEAD 52465		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Overhead - Pole & Feeder Replacements

RECOMMENDATION

Approve an annual budget range of $17.8M to $29.0M for the Overhead - Pole & Feeder Replacements program to address deteriorated overhead line assets that may result in an unacceptable risk of public contact, staff injury, or customer outage.

SCOPE

The scope of work for the Overhead Pole & Feeder Replacements program addresses the replacement of sections of overhead distribution assets that may include:

- Poles,
- Overhead conductors,
- Overhead transformers.

This program also includes work to reinforce poles using engineered steel products in instances where the remainder of the pole is found to be in serviceable condition.

Poles that have been damaged or require replacement for operational reasons are replaced in other programs or projects.

BACKGROUND

There are approximately 1.1 million wood poles in Manitoba Hydro's distribution system with an average useful life of approximately 75 years. The Overhead - Pole & Feeder Replacements common scope program focuses on the replacement and/or refurbishment of specific overhead line assets.

Sources of information used to determine which sections of line may have reached the end of their useful life resulting in a new investment include the following:

1. Asset Condition Assessments:
   - Planned condition assessments of 90,000 wood poles are scheduled to be completed as part of the IPM Pole Treatment program every year (resulting in a twelve-year inspection cycle) to assess the impact of Environmental, Biological, Wildlife, and Foreign Interference risk factors on the lower portion of the pole (i.e. from 2-feet below ground line to 6-feet above ground line).
   - Detailed overhead feeder inspections are scheduled on a six-year cycle to assess pole issues such as the degree of shell rot, setting depth, land, ground clearance, and alignment.

2. Electrical Performance and Reliability Assessments - using:
   - Distribution Maintenance Planning System (DMPS)
   - Distribution performance data – capacity, voltage, protection
   - Quarterly reporting on feeder performance and System Average Interruption Duration Index (SAIDI)
   - Feeder performance within the Distribution Outage Performance Reporting System (DOPRS)

BACKGROUND

3. Customer Criticality Assessment – identifying:
    - Critical services such as hospitals and life support customers
    - Number and type of customers
    - Access, spans with vegetation
    - Condition related outages

Inspection results are reviewed, and schedules developed to complete the required work with consideration for available local resources. Selected projects are designed and estimated internally, with refurbishment work completed by line construction contractors or internal construction resources.

Prior to fiscal year 2021, investments in pole and feeder assets were captured under two separate programs: Overhead – Line Refurbishment and Overhead – IPM Replace & Reinforce. Effective April 1, 2020, to improve program management and workflow efficiency, investments in pole and feeder assets will be captured under a single program: Overhead – Pole and Feeder Replacements.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

The Overhead Pole & Feeder Replacements program determines when to replace and/or refurbish specific assets based on asset condition, performance, reliability and customer criticality. This program addresses deteriorated overhead line assets that would result in unacceptable risk of public contact, staff injury, or unacceptable customer outages.

The benefits to both customers and the corporation in addressing distribution line issues in a timely manner include:

- **Public Safety** – failures of overhead plant can potentially expose the public to serious injury from contact with energized plant.
- **Employee Safety** – A very serious or disabling injury could result for staff or contractors working on or near poles and other distribution line equipment if they are in very poor condition.
- **Reliability** – failures of overhead plant can lead to lengthy outages for customers.
- **Financial** – Cost of addressing the failure of distribution lines after collapse is higher than performing replacements in a planned manner following condition assessments.
- **Other benefits** include reduced potential for liability related to public injuries and property damage.

The recommended budget addresses currently identified replacement requirements. The minimum and maximum budget assumes approximately +/-20% difference to the recommended budget.

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget	Value	Value/ $K
Recommended	$25,760	557,784	1.74
Maximum	$29,000	N/A	N/A
Minimum	$17,800	N/A	N/A

PROGRAM RISK ANALYSIS

Project management risk is unique to each investment that will be raised. Each investment will address project management risk appropriately.

IMPACT ON O&A COSTS

No significant O&A costs are expected associated with replacing or refurbishing existing assets.

RELATED INVESTMENTS

Integrated Pole Maintenance (IPM) Treatment program - Distribution wood poles that are considered serviceable receive remedial treatment as part of the IPM Pole Treatment Program on an average 12-year cycle following new installation. Remedial treatments are designed to provide specific pole types with added protection internally and externally to extend their service life.

OTHER ALTERNATIVES CONSIDERED

No other alternatives were considered applicable for this program.

REFERENCE DOCUMENTS

None.

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Distribution Modifications-Small Scope

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$9,500 to $13,500
CONTRIBUTIONS RANGE (ANNUAL):	$0 to $0
NET BUDGET RANGE (ANNUAL):	$9,500 to $13,500
(values listed above are in thousands of dollars)	
CORPORATE VALUE FRAMEWORK SCORE: (CVF score not required for Customer Service investments)	**Value:** N/A **Value/$K:** N/A

DATE PREPARED: 2019/03/07

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Steele, Chuck	ACTING VP OF MARKETING & CUSTOMER SERVICE AND DIRECTOR OF ENGINEERING & CONSTRUCTION		Director - Engineering & Construction	2019/12/18
Patterson, Cyril	DIRECTOR CUST SERVICE OPERATIONS - RURAL		Director - CSO Rural	2019/12/18
Waddell, Jared	DISTRIBUTION PORTFOLIO SERVICES DEPT MGR		Dist. Contract, Program & Project Mgmt	2019/12/17
Braid, Kristin	DISTRIBUTION ASSET MANAGEMENT DEPT MGR		Planning, Protection & Asset Strategy	2019/12/17
Lawrie, Sarah	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2019/12/17
Cooke, Jim	CAPITAL PLANNING SECTION HEAD		Planning, Protection & Asset Strategy	2019/03/14

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Marketing & Customer Service	**REQUESTING OPERATING/CORPORATE GROUP:**	Marketing & Customer Service
RESPONSIBLE DIVISION:	Engineering & Construction	**REQUESTING DIVISION:**	Engineering & Construction
RESPONSIBLE DEPARTMENT:	Distribution Asset Management		
I.M. NODE NUMBER:	2.1.40.25.07.8	**W.B.S. NUMBERs:**	B:00386
C55 INVESTMENT CODE:	13501		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**PROGRAM TYPE**:	Variable Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C3 / Sustainment (Level 2) CM / System Renewal		

CONTACTS			
PREPARED BY:	Cooke, Jim CAPITAL PLANNING SECTION HEAD 52465	**REQUESTOR:**	Braid, Kristin MANAGER DISTRIBUTION ASSET MANAGEMENT 52465
PROJECT MANAGER:	Isaac, Rob DISTRIBUTION CAPITAL & RISK MGMT ADVISOR 52465		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Distribution Modifications-Small Scope

RECOMMENDATION

Approve an annual budget range of $9.5M to $13.5M for the Distribution Modifications - Small Scope program, which includes smaller investments typically less than $1.0M. This program is required to maintain the integrity of the electrical distribution system.

SCOPE

Includes Class A and Class B Customer Service Orders for both system improvement and customer service driven work to:

- Replace serialized equipment that has failed in service,
- Salvage abandoned assets,
- Replace farm metering units,
- Add or modify assets to address joint use attachment requests received via Joint Use Permits,
- Add or modify distribution feeder protection equipment,
- Improve the distribution system to respond to customer requests.

The scope of work permitted within Class A and Class B work orders is defined in Corporate Policy P226; which is owned by the Director, Customer Service Operations - Rural. The intent of Corporate Policy P226 is to restrict a Customer Service Order to minor modifications to the distribution system which are needed to provide adequate service to customers and can be built to Manitoba Hydro Standards for 66kV and below.

BACKGROUND

The Distribution Modifications - Small Scope Program is a variable scope program for investments created by Customer Service Centre staff to maintain the operational integrity of the distribution system, or to modify the system to allow for new or expanded customer connections. These investments are not identified during the Manitoba Hydro capital planning cycle, rather are driven by external events. Investments are relatively small, generally less than $10,000, and typically take less than a month to complete. The work orders for these investments are completed by Customer Service Centre staff making use of the sealed Manitoba Hydro Standards for 66kV and below, allowing for design and construction activity to be decentralized and completed by numerous Customer Service Centre staff across the province.

Corporate Policy P225 outlines the approval for originating Customer Service Orders. Customer Service Centre Supervisors approve Customer Service Orders prior to construction.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

The Distribution Modifications - Small Scope Program is a collection of Class A and Class B Customer Service Orders that provide the Customer Service Operations Divisions within the Marketing & Customer Service Operating Group the agility required to maintain the integrity of the electrical distribution system.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

The benefits to both customers and the corporation in responding to issues in a timely manner include:

- **Reliability** – Replacing failed equipment and salvaging abandoned assets.
- **Public Safety** – Adding or modifying distribution protection equipment ensures equipment or circuits are de-energized in the event of a fault.
- **Customer Service** - Ensuring assets are equipped for new or expanded customer connections to the electrical system.
- **Joint-Use Partnerships** - Fulfilling contractual obligations to joint-use partners by ensuring our assets are ready for their attachments.

The budget range reflects the minimum and maximum investment levels experienced over the previous three years.

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget	Value	Value/ $K
Minimum	$9,500	N/A	N/A
Maximum	$13,500	N/A	N/A

PROGRAM RISK ANALYSIS

There are no unusual or special risks associated with proceeding with these investments as recommended.

IMPACT ON O&A COSTS

Minimal operating and administrative cost changes.

RELATED INVESTMENTS

None.

OTHER ALTERNATIVES CONSIDERED

The least cost alternative to replace/modify equipment is identified to proceed; other alternatives are not considered.

REFERENCE DOCUMENTS

None.

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Lighting - Standard, Base & Cable Replacement

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$5,700 to $9,000
CONTRIBUTIONS RANGE (ANNUAL):	$0 to $0
NET BUDGET RANGE (ANNUAL):	$5,700 to $9,000
(values listed above are in thousands of dollars)	
CORPORATE VALUE FRAMEWORK SCORE: (CVF scores reflect the Recommended alternative)	**Value:** 42,706 **Value/$K:** 0.44

DATE PREPARED: 2019/01/17

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Steele, Chuck	DIRECTOR OF ENGINEERING & CONSTRUCTION / ACTING VP MARKETING & CUSTOMER SERVICE		Director - Engineering & Construction	2019/03/22
Braid, Kristin	DISTRIBUTION ASSET MANAGEMENT DEPT MGR		Planning, Protection & Asset Strategy	2019/03/22
LAWRIE, SARAH	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2019/03/22
Isaac, Rob	DISTRIBUTION CAPITAL & RISK MGMT ADVISOR		Planning, Protection & Asset Strategy	2019/03/22

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Marketing & Customer Service	**REQUESTING OPERATING/CORPORATE GROUP:**	Marketing & Customer Service
RESPONSIBLE DIVISION:	Engineering & Construction	**REQUESTING DIVISION:**	Engineering & Construction
RESPONSIBLE DEPARTMENT:	Distribution Asset Management		
I.M. NODE NUMBER:	2.1.40.25.09.1	**W.B.S. NUMBERs:**	B:00332
C55 INVESTMENT CODE:	13504		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**PROGRAM TYPE**:	Common Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C3 / Sustainment (Level 2) CM / System Renewal		

CONTACTS			
PREPARED BY:	Shabaga, Jeff DIST ASSET STRATEGIES SECTION HEAD 52465	**REQUESTOR:**	Kristin Braid
PROJECT MANAGER:	Shabaga, Jeff DIST ASSET STRATEGIES SECTION HEAD 52465		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Lighting - Standard, Base & Cable Replacement

RECOMMENDATION

Approve an annual budget range of $5.7M to $9.0M for the Lighting – Standards, Base and Cable Replacement Program to address deteriorated assets that could result in an unacceptable risk of public safety.

SCOPE

The scope of work for the Lighting – Standards, Base and Cable Replacement program includes the replacement of:

- Light standard, pole mounting arm,
- Bases,
- Cable or Conductor,
- Enclosed lamp fitting to carry replaceable bulbs and control wiring.

Replacement of bulbs is not included in this program unless the entire street light standard unit has collapsed as a result of damage (e.g. accident or equipment contact) or as a result of deteriorated condition/obsolescence of the lamp fitting. Bulbs are normally replaced as part of operating programs to replace failed bulbs or as part of group bulb replacement programs.

BACKGROUND

Manitoba Hydro has approximately 58,000 streetlight standards installed in the province. The majority of these standards are located within the City of Winnipeg. Streetlight standards typically consist of tubular steel or aluminum that support lights and are used to provide roadway lighting in urban and high traffic locations.

Streetlight standards come in a variety of different heights and designs and are typically painted, galvanized, or self-weathering steel. There are three primary methods of streetlight installations: concrete pile bases, direct burial and steel power screw. Concrete pile and bases are the most prevalent installation of streetlight standards and are the current design standard. Direct burial and power screw streetlight installations are also common and were installed based on previous design standards. Both direct burial and power screw standard installations can be susceptible to below grade corrosion.

Streetlight standards are subject to environmental conditions and mechanical damage. The nature and severity of the damage depends on the pole location and its environment.

- The main contributor to the structural breakdown of streetlight standards is corrosion, both above and below the soil surface. Corrosive environments are typically associated with the proximity of the streetlight to salt spray from vehicular traffic, but differences in soil chemistry also contribute to below grade corrosion. Streetlight standards with metal in contact with the soil (power screw anchored or direct buried) are the most susceptible to this type of degradation.
- Another factor impacting streetlight strength is damage caused by contact from snow clearing or construction equipment and vehicular accidents. Dents, cuts, or severe damage from this type of contact can also result in the failure of a standard.

Lighting standards are inspected each summer on a four year cycle and replaced for technical failure when:

- The standard has a dent exceeding 50 mm, or
- The standard has a puncture exceeding 50 mm, or
- There is any evidence of rust penetration.

BACKGROUND

During inspections, streetlight standards are classified into the following four categories:

- **Critical**: Typically associated with severely damaged standards at risk of falling; are addressed immediately, the site is secured and the failed standard is replaced on a priority basis.
- **High**: Evidence of rust penetration, cracked welds/bottom plates, and major dents.
- **Medium**: Minor dents and localized corrosion.
- **Low**: Peeling paint and graffiti.

Lighting standards that require replacement are identified through inspections coordinated by Customer Service Centre staff and recorded within the Distribution Maintenance Planning System (DMPS) registry. Replacement work is estimated and coordinated by Distribution Asset Strategies on an annual basis with high safety risk equipment prioritized. Prioritization is based on the condition of the structure, location in proximity to people and property, and impact of the potential failure of the unit (i.e. a unit found in poor condition in a densely populated area would be prioritized ahead of a unit found in a similar condition in a remote location). Contracted resources and occasionally internal construction resources are used for replacements.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

Street lighting is an essential service to provide roadway lighting in primarily urban and high traffic locations across Manitoba. Investments in the Lighting – Standards, Base and Cable Replacement program are planned to maintain a safe and reliable lighting system. The program determines when to replace and/or refurbish specific lighting assets based on asset condition, public safety and performance.

The benefits to both customers and the corporation in addressing lighting issues in a timely manner include:

- **Public Safety** – Reliable roadway lighting is critical for safety of pedestrians and motorists. Also safety risks from degraded light standards can potentially expose the public to injury or property damage from the light standard collapse failures.
- **Financial** – Cost of addressing the failure of light standards after collapse is higher than performing replacements in a planned manner following condition assessments.
- **Other benefits** include, maintaining compliance with lighting agreements with cities, municipalities and private parties, and reduced potential for liability.

The recommended budget addresses currently identified replacement requirements. The minimum and maximum budget assumes approximately +/-20% difference to the recommended budget.

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget	Value	Value/ $K
Minimum	$5,700		
Maximum	$9,000		

PROGRAM RISK ANALYSIS

There are no unusual or special risks associated with proceeding with these investments as recommended.

IMPACT ON O&A COSTS	
There will be no significant operating and administrative costs associated with the replacement of lighting standards and associated equipment.	

RELATED INVESTMENTS
None.

OTHER ALTERNATIVES CONSIDERED
No other alternatives were considered applicable for this program.

REFERENCE DOCUMENTS
None.

C55-CIJ-PROG-AD

CAPITAL INVESTMENT JUSTIFICATION ADDENDUM FOR

Lighting - Standard, Base & Cable Replacement

Investment Type (Program)

Addendum Number 1

	PREVIOUSLY APPROVED	REVISED	INCREASE/ (DECREASE)
BUDGET RANGE (Annual):	$5,700 to $9,000	$6,500 to $11,500	$800 to $2,500
CONTRIBUTIONS RANGE (Annual):	$0 to $0	$0 to $0	$0 to $0
NET BUDGET RANGE(Annual):	$5,700 to $9,000	$6,500 to $11,500	$800 to $2,500
			(values listed above are in thousands of dollars)
CORPORATE VALUE FRAMEWORK SCORE:	**Value:** 42,706	**Value:** 62,100	
	Value/$K: 0.44	**Value/$K:** 0.48	
			(CVF scores reflect the Recommended alternative)

DATE PREPARED: 2020-04-09

EC/MHEB APPROVAL MINUTE & DATE:

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APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Midford, Lorne	VP ASSET PLANNING & DELIVERY		Vice President – Asset Planning & Delivery	2020-04-30
Turner, Hal	DIRECTOR ASSET MANAGEMENT		Director - Asset Management	2020-04-28
Braid, Kristin	DISTRIBUTION ASSET MANAGEMENT DEPT MGR		Planning, Protection & Asset Strategy	2020-04-28
Lawrie, Sarah	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2020-04-27
Cooke, Jim	CAPITAL PLANNING SECTION HEAD		Planning, Protection & Asset Strategy	2020-04-09

ADDENDUM NUMBER	DATE	REVISION (Summary of change)
	March 22, 2019	Original program CIJ approved by the Acting VP of Marketing and Customer Service, with an annual budget range of $5.7M to $9.0M.

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Marketing & Customer Service	**REQUESTING OPERATING/CORPORATE GROUP:**	Marketing & Customer Service
RESPONSIBLE DIVISION:	Engineering & Construction	**REQUESTING DIVISION:**	Engineering & Construction
RESPONSIBLE DEPARTMENT:	Distribution Asset Management		
I.M. NODE NUMBER:	2.1.40.25.09.1	**W.B.S. NUMBERs:**	B:00332
C55 INVESTMENT CODE:	13504		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**PROGRAM TYPE**:	Common Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C3 / Sustainment (Level 2) CM / System Renewal		

CONTACTS			
PREPARED BY:	Cooke, Jim CAPITAL PLANNING SECTION HEAD 52465	**REQUESTOR:**	Kristin Braid, Manager DISTRIBUTION ASSET MANAGEMENT 52465
PROJECT MANAGER:	Kenning, Bryan UNDERGROUND PROGRAMS COORDINATOR 52610		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Lighting - Standard, Base & Cable Replacement

RECOMMENDATION

Approve an annual budget range for the Lighting – Standards, Base and Cable Replacement Program of $6.5M to $11.5M to address deteriorated assets that could result in an unacceptable risk to public safety.

SCOPE

The scope of work includes replacement of:

- Light standards,
- Pole mounting arms,
- Bases,
- Cable or Conductors,
- Enclosed lamp fitting to carry replaceable bulbs and control wiring,
- Old trolley poles and secondary cabling in the downtown Winnipeg area.

Replacement of bulbs are not included in this program unless the entire street light standard unit collapsed because of damage (e.g. accident or equipment contact), or because the lamp fitting is deteriorated or obsolete. Operating programs exist to replace single failed bulbs, or to replace bulbs as part of a larger group replacements.

BACKGROUND

Manitoba Hydro has approximately 73,000 streetlight standards installed in the province. The majority of these standards are located within the City of Winnipeg. Streetlight standards typically consist of tubular steel or aluminum that support lights and are used to provide roadway lighting in urban and high traffic locations.

Streetlight standards come in a variety of different heights and designs and are typically painted, galvanized, or self-weathering steel. There are three primary methods of streetlight installations: concrete pile bases, direct burial and steel power screw. Concrete pile and bases are the most prevalent installation of streetlight standards and are the current design standard. Direct burial and power screw streetlight installations are also common and were installed based on previous design standards. Both direct burial and power screw standard installations can be susceptible to below grade corrosion.

Streetlight standards are subject to environmental conditions and mechanical damage. The nature and severity of the damage depends on the pole location and its environment.

- The main contributor to the structural breakdown of streetlight standards is corrosion, both above and below the soil surface. Corrosive environments are typically associated with the proximity of the streetlight to salt spray from vehicular traffic, but differences in soil chemistry also contribute to below grade corrosion. Streetlight standards with metal in contact with the soil (power screw anchored or direct buried) are the most susceptible to this type of degradation.
- Another factor impacting streetlight strength is damage caused by contact from snow clearing or construction equipment and vehicular accidents. Dents, cuts, or severe damage from this type of contact can also result in the failure of a standard.

Lighting standards are inspected each summer on a four-year cycle and replaced for technical failure when:

- The standard has a dent exceeding 50 mm, or
- The standard has a puncture exceeding 50 mm, or

BACKGROUND

- There is any evidence of rust penetration.

During inspections, streetlight standards are classified into the following four categories:

- **Critical**: Typically associated with severely damaged standards at risk of falling. These are addressed immediately, the site is secured, and the failed standard is replaced on a priority basis.
- **High**: Evidence of rust penetration, cracked welds/bottom plates, and major dents.
- **Medium**: Minor dents and localized corrosion.
- **Low**: Peeling paint and graffiti.

Trolley poles were installed in Winnipeg's downtown area in the 1950's when the city had an operational trolley bus system. Secondary cabling was attached to the poles to power the trolley cars, or for routing power to nearby trolley shelters or customers. Safety concerns surrounding trolley poles were identified as the poles are corroding and, in some instances, have fallen over. Inspections of the trolley poles identified water pooling at the connection between the trolley pole and street light arm, which caused the arm to rust through. Sixty-three trolley poles on Broadway Avenue have been flagged for replacement; trolley poles in other areas of downtown Winnipeg (Main Street) also need to be replaced.

Lighting standards that require replacement are identified through inspections coordinated by Customer Service Centre staff and recorded within the Distribution Maintenance Planning System (DMPS) registry. Replacement work is estimated and coordinated by Distribution Asset Strategies on an annual basis with high safety risk equipment prioritized. Prioritization is based on the condition of the structure, location in proximity to people and property, and impact of the potential failure of the unit (i.e. a unit found in poor condition in a densely populated area would be prioritized ahead of a unit found in a similar condition in a remote location). Contracted resources and occasionally internal construction resources are used for replacements.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

Street lighting is an essential service to provide roadway lighting in primarily urban and high traffic locations across Manitoba. Investments in the Lighting – Standards, Base and Cable Replacement program are planned to maintain a safe and reliable lighting system. The program determines when to replace and/or refurbish specific lighting assets based on asset condition, public safety and performance.

The benefits to both customers and the corporation in addressing lighting issues in a timely manner include:

- **Public Safety** – Reliable roadway lighting is critical for safety of pedestrians and motorists. Also, safety risks from degraded light standards can potentially expose the public to injury or property damage from the light standard collapse failures.
- **Financial** – Cost of addressing the failure of light standards after collapse is higher than performing replacements in a planned manner following condition assessments.
- **Other benefits** include, maintaining compliance with lighting agreements with cities, municipalities and private parties, and reduced potential for liability.

Streetlight replacement work has increased, mainly due to structural issues related to 45-foot streetlights installed in the 1950/60's with metal power screw bases. Some of the bases degraded so significantly that streetlights fell over. Several excavations have been completed with similar deterioration noted. As a result, notifications have

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

been created to replace all power screw bases with concrete bases. Since no practical inspection process to view the condition of the bases underground exists, direct replacement is the recommended opinion. Increased program funding and contract resources are planned to address this issue.

Replacement of old trolley poles is expected to take four years and cost approximately $1.0M annually.

The recommended budget addresses currently identified replacement requirements. The minimum and maximum budget assumes approximately +/-20% difference to the recommended budget.

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Lighting - Standard, Base & Cable Replacement

PROGRAM ALTERNATIVES

	PREVIOUSLY APPROVED			PROPOSED			INCREASE / (DECREASE)
Alternative Name	Annual Budget	Value	Value/ $K	Annual Budget	Value	Value/ $K	Annual Budget
Minimum	$5,700	N/A	N/A	$6,500	N/A	N/A	$800
Maximum	$9,000	N/A	N/A	$11,500	N/A	N/A	$2,500

PROGRAM RISK ANALYSIS

There are no unusual or special risks associated with proceeding with these investments as recommended.

IMPACT ON O&A COSTS

There will be no significant operating and administrative costs associated with the replacement of lighting standards and associated equipment.

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Lighting - Standard, Base & Cable Replacement

RELATED INVESTMENTS
None.

OTHER ALTERNATIVES CONSIDERED
No other alternatives were considered applicable for this program.

REFERENCE DOCUMENTS
Originally Approved CIJ

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Overhead – Integrated Pole Maintenance (IPM) Pole Treatment

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$6,200 to $9,300
CONTRIBUTIONS RANGE (ANNUAL):	$0 to $0
NET BUDGET RANGE (ANNUAL):	$6,200 to $9,300
(values listed above are in thousands of dollars)	
CORPORATE VALUE FRAMEWORK SCORE: (CVF scores reflect the Recommended alternative)	**Value:** 257,067 **Value/$K:** 2.33

DATE PREPARED: 2019/01/10

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Steele, Chuck	DIRECTOR OF ENGINEERING & CONSTRUCTION/ACTING VP MARKETING & CUSTOMER SERVICE		Director - Engineering & Construction	2019/01/18
Braid, Kristin	DISTRIBUTION ASSET MANAGEMENT DEPT MGR		Planning, Protection & Asset Strategy	2019/01/18
LAWRIE, SARAH	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2019/01/17
Isaac, Rob	DISTRIBUTION CAPITAL & RISK MGMT ADVISOR		Planning, Protection & Asset Strategy	2019/01/17

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Marketing & Customer Service	**REQUESTING OPERATING/CORPORATE GROUP:**	Marketing & Customer Service
RESPONSIBLE DIVISION:	Engineering & Construction	**REQUESTING DIVISION:**	Engineering & Construction
RESPONSIBLE DEPARTMENT:	Distribution Asset Management		
I.M. NODE NUMBER:	2.1.40.25.07.1	**W.B.S. NUMBERs:**	B:00379
C55 INVESTMENT CODE:	13494		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**PROGRAM TYPE**:	Common Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C3 / Sustainment (Level 2) CM / System Renewal		

CONTACTS			
PREPARED BY:	Shabaga, Jeff DIST ASSET STRATEGIES SECTION HEAD 52465	**REQUESTOR:**	Kristin Braid MANAGER DISTRIBUTION ASSET MANAGEMENT 52465
PROJECT MANAGER:	Shabaga, Jeff DIST ASSET STRATEGIES SECTION HEAD 52465		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Overhead - IPM Pole Treatment

RECOMMENDATION

Approve an annual budget range from $6.2 to $9.3 million for the Integrated Pole Maintenance (IPM) Pole Treatment program to economically extend the useful life of treatable poles.

SCOPE

Distribution wood poles that are considered serviceable receive remedial treatment as part of the IPM Pole Treatment Program on an average 15 year cycle following new installation. Remedial treatments are designed to provide specific pole types with added protection internally and externally to extend their service life.

BACKGROUND

There are approximately 1.1 million wood poles in Manitoba Hydro's distribution system. The average useful life of a new pole is approximately 75 years provided an ongoing program to deliver remedial pole treatments is maintained.

The condition of wood poles is impacted by a number of risk factors including:

- **Environmental**: Wood poles are subjected to wind and ice loads which can result in failures if the structure is not capable of withstanding the mechanical load. In addition, lighting strikes can physically damage the structure and salt spray contamination from vehicular traffic can result in pole fires.
- **Biological**: Wood poles are also subjected to damage as the result of rotting due to fungi.
- **Foreign Interference**: Contact of the pole by construction or snow removal equipment and vehicular traffic can mechanically damage the pole. Grass fires can also result in pole damage.
- **Wildlife**: Poles are susceptible to damage from animals such as ants, woodpeckers, beavers, and bears.

Planned condition assessments of wood pole assets are completed as part of the IPM program on average every 15 years to assess the impact of these risk factors on the lower portion of the pole (i.e. from 2 feet below ground line to 6 feet above ground line). The asset condition assessment process includes the following key steps:

- Excavation of the earth around the pole to a depth of 60 centimeters
- Thorough pole inspection inside and out
- Pole strength evaluation
- Remedial treatment if appropriate
- Filling and tamping of the excavation
- Attribute information for the pole is updated electronically

Following inspection, wood poles that are 15+ years past new installation and considered serviceable receive remedial treatment as part of the IPM Pole Treatment Program. These remedial treatments are designed to provide the poles with added protection internally and externally to extend their service life. Green poles are treated with a permanent chemical bond whereas brown poles are coated to prevent biodegrading. Both pole types are provided internal remedial treatments following core condition sampling procedures.

The IPM program has historically inspected approximately 60,000 poles per year and is expected to increase to levels of nearly 90,000 poles each year to move to an inspection cycle to address both the aging poles and degrading issues with Chromated Copper Arsenate (CCA) or green poles. Treatment costs average approximately $75 per pole compared to replacement costs of approximately $3,500 per pole. Specific remedial treatment cycle times are associated with each pole types, also considering ground and location conditions.

BACKGROUND

As an example sub-transmission poles typically have a remedial cycle of approximately 8-10 years and many distribution poles have a remedial cycle of approximately 12-15 years.

The number of poles included in the treatment program each year is a product of the inspection cycle which is based on addressing the aging poles and degrading issues with specific CCA or green poles, as well as overall constraints such as weather (inspections require soil digging) and resources.

Work conducted in this program is prioritized, estimated and coordinated on an annual basis by the Distribution Asset Strategies section of the Distribution Asset Management Department in order to ensure appropriate remedial treatment cycles are maintained for all wood poles. Manitoba Hydro uses mainly contracted resources to complete the inspection and treatment process.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

Asset condition assessments conducted through the IPM program are planned to be increased to 90,000 poles each year for the next several years over normal levels of approximately 60,000 poles per year in order to address two main issues:

- Approximately 260,000 poles were installed between 1945 and 1960 during rural electrification; these assets are nearing the end of their serviceable lives during the period 2020 to 2035.
- Recent reviews of poles treated with Chromated Copper Arsenate (CCA) have identified poles potentially having higher failure rates due to treatment issues.

With the increased volume of asset condition inspections, higher volumes of work are anticipated in this program. The recommended budget addresses currently identified requirements. The minimum and maximum budget assumes some growth for the anticipated growth in inspections to a level of 90,000 poles.

The benefits to both customers and the corporation in maintaining an ongoing remedial treatment program for all wood pole assets include:

- **Financial** – Cost of replacing a pole is significantly higher than the cost associated with remedial treatment. (i.e. $75/ pole for treatment vs. $3,500/ pole for replacement).
- **Other long term benefits** include - reduced potential for increases in pole failure impacting safety and reliability, as well providing an opportunity to help manage the timing of financial and labour resources required to replace the 1.1 million wood pole assets when they reach the end of their serviceable life.

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget	Value	Value/ $K
Minimum	$6,200		
Maximum	$9,300		

PROGRAM RISK ANALYSIS

There are no unusual or special risks associated with proceeding with these investments as recommended.

IMPACT ON O&A COSTS	
There will be no significant O&A costs associated with the pole treatments.	

RELATED INVESTMENTS
Integrated Pole Maintenance Replacement and Reinforcement program Overhead - Line Refurbishment program

OTHER ALTERNATIVES CONSIDERED
No other alternatives were considered applicable for this program.

REFERENCE DOCUMENTS
None.

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Underground – Cable Replacement

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$5,360 to $8,500
CONTRIBUTIONS RANGE (ANNUAL):	$0 to $0
NET BUDGET RANGE (ANNUAL):	$5,360 to $8,500
	(values listed above are in thousands of dollars)
CORPORATE VALUE FRAMEWORK SCORE: (CVF scores reflect the Recommended alternative)	**Value:** 77,157 **Value/$K:** 0.78

DATE PREPARED: 2019/02/20

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Steele, Chuck	DIRECTOR OF ENGINEERING & CONSTRUCTION / ACTING VP MARKETING & CUSTOMER SERVICE		Director - Engineering & Construction	2019/03/22
Braid, Kristin	DISTRIBUTION ASSET MANAGEMENT DEPT MGR		Planning, Protection & Asset Strategy	2019/03/22
LAWRIE, SARAH	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2019/03/20
Isaac, Rob	DISTRIBUTION CAPITAL & RISK MGMT ADVISOR		Planning, Protection & Asset Strategy	2019/03/20

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Marketing & Customer Service	**REQUESTING OPERATING/CORPORATE GROUP:**	Marketing & Customer Service
RESPONSIBLE DIVISION:	Engineering & Construction	**REQUESTING DIVISION:**	Engineering & Construction
RESPONSIBLE DEPARTMENT:	Distribution Asset Management		
I.M. NODE NUMBER:	2.1.40.25.06.2	**W.B.S. NUMBERs:**	B:00374
C55 INVESTMENT CODE:	13491		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**PROGRAM TYPE**:	Common Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C3 / Sustainment (Level 2) CM / System Renewal		

CONTACTS			
PREPARED BY:	Shabaga, Jeff DIST ASSET STRATEGIES SECTION HEAD 52465	**REQUESTOR:**	Kristin Braid
PROJECT MANAGER:	Shabaga, Jeff DIST ASSET STRATEGIES SECTION HEAD 52465		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Underground – Cable Replacement

RECOMMENDATION

Approve an annual budget range of $5.4M to $8.5M for the Underground Cable Replacement program to address deteriorated cable assets that may result in an unacceptable risk of customer outage.

SCOPE

The scope of work for the Underground Cable Replacement program is to replace cable that has either:

- Been inspected and/or assessed for operational performance and found to be in poor/very poor condition with a high risk of failure within a one to two year time period, or
- Has faulted, and poses a high risk of re-failure.

Cables that are identified by Distribution Planning for replacement/upgrade to address capacity needs or area voltage conversion are replaced in other programs or projects, generally coordinated with required replacement of other distribution asset types.

BACKGROUND

Underground cables are insulated conductors that are utilized to distribute electricity from source substations to distribution transformers. Unlike overhead conductors, underground cables are typically insulated through a non-gaseous insulating medium (i.e. plastic, rubber, paper, or oil), that can be installed directly in the ground. The main advantage of using insulating material on underground cables is increased electric strength allowing for the cables to be installed in close proximity to one another. There are five different types of underground cable, totaling over 10,000 km, installed on the distribution system with relative population noted below:

- Cross Linked Poly Ethylene (XLPE) - 37%
- Tree Retardant Cross Linked Poly Ethylene (TRXLPE) – 60%
- Paper Insulated Lead Covered (PILC) – 3%
- Rubber Insulated Neoprene Jacket (RINJ) – 0.1%
- Rubber Insulated Poly Vinyl Chloride Jacket (RIPVCJ) – 0.1%

Manitoba Hydro's distribution system is province wide; however, underground cables are most prevalent in urban centers, particularly the City of Winnipeg. They are also found in areas of rural Southern Manitoba which are most sensitive to ice storms.

Since 1988, nearly 2000 cable faults have occurred (excluding dig-ins) with an average of 60 faults per year. Fault rates have been increasing at approximately 7% per year.

The condition of underground cable is impacted by a number of risk factors including:

- **Mechanical damage:** Primarily caused from external factors. Examples include excavation or construction equipment contacting energized underground cables or vehicular accidents striking a cable lateral pole. Either incident could result in breaching of the cable insulation, resulting in a cable fault or damage to the cable material. The resultant damage, even if it does not manifest as an immediate fault, could result in a future cable failure due to increased cable electrical stress or moisture ingress into the cable insulation.
- **Operational stress:** Occurs in the course of operation, as cables are subjected to voltage stress, heat from loading and environmental elements. When the insulation degrades, faults result reducing the cable life expectancy. Faults are generally replaced with a splice, which can be completed up to 3 times per cable segment before replacement is required.

BACKGROUND

Decisions to replace a section of cable consider recent inspection results as well as the following operating issues:

- Number of faults experienced within a cable section.
- Cable section has faulted in a collapsed duct line and requires replacement as it cannot be spliced.
- Cable section has irreparably been damaged as the result of a system fault.
- A bare concentric neutral or taped shield XLPE conductor has experienced extensive corrosion and is no longer adequate to carry system in-balance or fault current.
- Distribution Planning has determined the cable capacity needs to be increased to supply customer load.
- Distribution Planning has determined the area voltage requires conversion.

Inspection results and operating fault issues for specific cable assets are recorded by Customer Service Centre staff in the Distribution Maintenance Planning System registry. Customer Service Centre staff then request cable replacements via work order requests to Distribution Asset Strategies.

Most cables identified for replacement through this program are replaced within two years. If a cable fault occurs, that results in a loss of power and one of the below conditions, the cable is remediated immediately and replaced as soon as possible:

- Potentially hazardous conditions (e.g. exposed emergency cables) to front line staff/general public
- Loss of critical redundancy (e.g. hospitals)
- A substantial loss of revenue to a customer due to inability to restore service, or
- Damage to property.

In general, Distribution Asset Strategies, in consultation with Distribution Planning and Distribution Design, reviews cable replacement requests and develops schedules to complete the required work within the targeted two year timeframe. Replacements are generally sent to Distribution Design for estimating and design, with replacements completed by internal construction staff, or occasionally contractors.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

The Underground Cable Replacement program determines when to replace specific cable assets based on asset condition, performance, reliability and customer criticality.

The benefits to both customers and the corporation in addressing cable issues in a timely manner include:

- **Reliability** – Cable failures can lead to lengthy outages for customers.
- **Financial** – Cost of addressing the condition of cables is lower when performing replacement work in a planned manner following condition assessments.

At a replacement cost of approximately $200/meter, the minimum and maximum budget allows for replacing approximately 25 to 45 kilometers of cable per year.

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget	Value	Value/ $K
Minimum	$5,360		
Maximum	$8,500		

PROGRAM RISK ANALYSIS
Project management risk is unique to each investment that will be raised. Each investment will address project management risk appropriately.

IMPACT ON O&A COSTS	
There will be no significant operating and administrative costs associated with new assets.	

RELATED INVESTMENTS
None.

OTHER ALTERNATIVES CONSIDERED
No other alternatives were considered applicable for this program.

REFERENCE DOCUMENTS
None.

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Underground - Cable Injection

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$3,350 to $5,100
CONTRIBUTIONS RANGE (ANNUAL):	$0 to $0
NET BUDGET RANGE (ANNUAL):	$3,350 to $5,100
(values listed above are in thousands of dollars)	
CORPORATE VALUE FRAMEWORK SCORE: (CVF scores reflect the Recommended alternative)	**Value:** 110,754 **Value/$K:** 1.67

DATE PREPARED: 2019/02/12

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Steele, Chuck	DIRECTOR OF ENGINEERING & CONSTRUCTION / ACTING VP MARKETING & CUSTOMER SERVICE		Director - Engineering & Construction	2019/03/22
Braid, Kristin	DISTRIBUTION ASSET MANAGEMENT DEPT MGR		Planning, Protection & Asset Strategy	2019/03/22
LAWRIE, SARAH	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2019/03/19
Isaac, Rob	DISTRIBUTION CAPITAL & RISK MGMT ADVISOR		Planning, Protection & Asset Strategy	2019/03/19

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Marketing & Customer Service	**REQUESTING OPERATING/CORPORATE GROUP:**	Marketing & Customer Service
RESPONSIBLE DIVISION:	Engineering & Construction	**REQUESTING DIVISION:**	Engineering & Construction
RESPONSIBLE DEPARTMENT:	Distribution Asset Management		
I.M. NODE NUMBER:	2.1.40.25.06.1	**W.B.S. NUMBERs:**	B:00373
C55 INVESTMENT CODE:	13490		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**PROGRAM TYPE**:	Common Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C3 / Sustainment (Level 2) CM / System Renewal		

CONTACTS			
PREPARED BY:	Shabaga, Jeff DIST ASSET STRATEGIES SECTION HEAD 52465	**REQUESTOR:**	Kristin Braid
PROJECT MANAGER:	Shabaga, Jeff DIST ASSET STRATEGIES SECTION HEAD 52465		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Underground - Cable Injection

RECOMMENDATION

Approve an annual budget range of $3.4M to $5.1M for the Underground Cable Injection program to economically extend the useful life of underground cable using silicone rejuvenation technology.

SCOPE

The scope of work for the Underground Cable Injection program includes the injection of a di-electric (silicone) fluid into power cable strands of medium voltage Cross Linked Poly Ethylene (XLPE) cables primarily used to provide service to residential subdivisions. Cables selected for injection may also require replacement of elbows and other component parts.

BACKGROUND

Underground cables are insulated conductors that are utilized to distribute electricity from source substations to distribution transformers. Unlike overhead conductors, underground cables are typically insulated through a non-gaseous insulating medium (i.e. plastic, rubber, paper, or oil), that can be installed directly in the ground. The main advantage of using insulating material on underground cables is increased electric strength allowing for the cables to be installed in close proximity to one another. There are five different types of underground cable, totaling over 10,000 km, installed on the distribution system with relative population noted below:

- Cross Linked Poly Ethylene (XLPE) - 37%
- Tree Retardant Cross Linked Poly Ethylene (TRXLPE) – 60%
- Paper Insulated Lead Covered (PILC) – 3%
- Rubber Insulated Neoprene Jacket (RINJ) – 0.1%
- Rubber Insulated Poly Vinyl Chloride Jacket (RIPVCJ) – 0.1%

Manitoba Hydro's distribution system is province wide; however, underground cables are most prevalent in urban centers, particularly the City of Winnipeg. They are also found in areas of rural Southern Manitoba which are most sensitive to ice storms.

Since 1988, nearly 2000 cable faults have occurred (excluding dig-ins) with an average of 60 faults per year. Fault rates have been increasing at approximately 7% per year.

The condition of underground cable is impacted by a number of risk factors including:

- **Mechanical damage:** Primarily caused from external factors. Examples include excavation or construction equipment contacting energized underground cables or vehicular accidents striking a cable lateral pole. Either incident could result in breaching of the cable insulation, resulting in a cable fault or damage to the cable material. The resultant damage, even if it does not manifest as an immediate fault, could result in a future cable failure due to increased cable electrical stress or moisture ingress into the cable insulation.
- **Operational stress:** Occurs in the course of operation, as cables are subjected to voltage stress, heat from loading and environmental elements. When the insulation degrades, faults result reducing the cable life expectancy. Faults are generally replaced with a splice, which can be completed up to 3 times per cable segment before replacement is required.

XLPE cable, the focus of the Underground - Cable Injection program, was largely installed from 1970 to 1986 and was originally estimated to have a service life of 30 to 40 years. Following installation, the service life of XLPE cable was extended mainly by splicing out faults. Standard practice also replaces XLPE cable with TRXLPE cable after a

BACKGROUND

third fault occurs on a cable segment. In the mid-to-late 1980's a new technology was developed to extend the life of XPLE cables through injecting a di-electric (silicone) fluid into power cable strands of XLPE cables. Manitoba Hydro has been deploying this approach to extend the life of XPLE cable since 2003 helping to reduce cable splicing and replacement requirements.

Approximately 150km of the nearly 3,800 km of XLPE cable installed is currently inspected annually. Inspections apply industry standard technology to evaluate and categorize the condition of cables as follows:

- **Healthy** - Action is deferred and the segment is retested in the future (approximately 30%).
- **Good, but evidence of degradation** - Service life can be extended with injection (approximately 53%).
- **Poor/very poor condition** – Degraded cable that cannot be injected is submitted for replacement as part of the Underground Cable Replacement program (approximately 17%).

In addition to inspection results, decisions to replace or inject a section of cable typically consider the following operating issues:

- Number of faults experienced within a cable section.
- Cable section has faulted in a collapsed duct line and requires replacement as it cannot be spliced.
- Cable section has irreparably been damaged as the result of a system fault.
- A bare concentric neutral or taped shield XLPE conductor has experienced extensive corrosion and is no longer adequate to carry system in-balance or fault current.
- Distribution Planning has determined the cable capacity needs to be increased to supply customer load.
- Distribution Planning has determined the area voltage requires conversion.

Underground cables can be rehabilitated by injecting a di-electric fluid between the cable strands to flush out impurities, encapsulate water and reinforce insulation. There are two methods of cable injection used:

- **Medium Pressure Cable Injection:** Silicone solution is "pushed" through the cable strands. The cable span is injected for several hours and extends the life of the cable by 40 years. This method cannot be used on cable with splices.
- **Low Pressure Cable Injection:** Silicone solution is "pulled" through the cable strands. The cable span is injected over several days or weeks depending on the length and location. The life of the cable is extended by 25 years. This method can be used on cable with splices.

The Underground Cable Injection program uses contract labour to inject cable. Internal staff from Customer Service Operations works with contract staff to oversee the program and perform quality inspections. The schedule for areas inspected is based on the XLPE locations, high risk fault areas, and analysis of cable performance. The timeline for remedial work is scheduled to be completed within two years from initiation to completion: Year 1 – inspection and testing; Year 2 – injection.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

The Underground Cable Management program determines when to inject specific cable assets based on asset condition and system performance.

The benefits to both customers and the corporation in maintaining an ongoing cable injection program for underground cable assets includes:

- **Financial** – Cable injection will significantly extend the lifespan of cables at a much lower cost than cable replacement (i.e. $40/ meter for injection vs. $200/ meter for replacement).

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

- **Other benefits**
  - Reduced potential of failures of cables impacting reliability;
  - More customer friendly than cable replacement as the process is fast with almost no disruption to established landscaping, and injection equipment is small and quiet. Cable replacement involves hand digging, trenching, or boring, which can disrupt landscaping and involve large, noisy equipment.

The minimum and maximum budget allows for injecting approximately 85 to 125 kilometers of XLPE cable per year.

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget	Value	Value/ $K
Maximum	$5,100		
Minimum	$3,350		

PROGRAM RISK ANALYSIS

There are no unusual or special risks associated with proceeding with these investments as recommended.

IMPACT ON O&A COSTS

There is no significant operating and administrative costs associated with the rejuvenated cable.

RELATED INVESTMENTS

None.

OTHER ALTERNATIVES CONSIDERED

No other alternatives were considered applicable for this program.

REFERENCE DOCUMENTS

None.

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Overhead & Underground Connects-Small Scope

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$18,000 to $24,000
CONTRIBUTIONS RANGE (ANNUAL):	($6,900) to ($8,300)
NET BUDGET RANGE (ANNUAL):	$11,100 to $15,700
(values listed above are in thousands of dollars)	
CORPORATE VALUE FRAMEWORK SCORE: (CVF score not required for Customer Service investments)	**Value:** N/A **Value/$K:** N/A

DATE PREPARED: 2018/12/19

EC/MHEB APPROVAL MINUTE & DATE: CAMEC-January 22/19

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Steele, Chuck	DIRECTOR OF ENGINEERING & CONSTRUCTION/ACTING VP MARKETING & CUSTOMER SERVICE		Director - Engineering & Construction	2019/01/15
Patterson, Cyril	DIRECTOR CUST SERVICE OPERATIONS - RURAL		Director - CSO Rural	2019/01/15
Waddell, Jared	DIRECTOR CUST SERVICE OPERATIONS - WPG		Director - CSO Wpg	2019/01/07
Braid, Kristin	DISTRIBUTION ASSET MANAGEMENT DEPT MGR		Planning, Protection & Asset Strategy	2018/12/21
LAWRIE, SARAH	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2018/12/20
Cooke, Jim	CAPITAL PLANNING SECTION HEAD		Planning, Protection & Asset Strategy	2018/12/20

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Marketing & Customer Service	**REQUESTING OPERATING/CORPORATE GROUP:**	Marketing & Customer Service
RESPONSIBLE DIVISION:	Engineering & Construction	**REQUESTING DIVISION:**	Engineering & Construction
RESPONSIBLE DEPARTMENT:	Distribution Asset Management		
I.M. NODE NUMBER:	2.1.40.25.03.1	**W.B.S. NUMBERs:**	B:00358
C55 INVESTMENT CODE:	13481		
SAP PROJECT TYPE:	23 - BOC-Corporate Asset Mgmt Exec Committee	**PROGRAM TYPE**:	Variable Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C1 / Capacity & Growth (Level 2) CG / Customer Connections -Residential Commercial Industrial		

CONTACTS			
PREPARED BY:	Cooke, Jim CAPITAL PLANNING SECTION HEAD 52465	**REQUESTOR:**	Braid, Kristin MANAGER DISTRIBUTION ASSET MANAGEMENT 52465
PROJECT MANAGER:	Cooke, Jim CAPITAL PLANNING SECTION HEAD 52465		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Overhead & Underground Connects-Small Scope

RECOMMENDATION

Approve an annual budget range (gross of contributions) of $18.0M to $24.0M which includes smaller investments typically less than $1.0M. This program is required in order to respond to external customer requests for new or expanded electrical service (66kV and below).

The budget range reflects the minimum and maximum investment levels experienced over the previous four years, with contributions received from customers forecasted from $6.9M to $8.3M.

SCOPE

This program includes: Class A and Class B Customer Service Orders, representing investments to respond to customer requested electric service for residential, commercial, and industrial load.

The scope of work permitted within Class A and Class B work orders is defined in Corporate Policy P226; a policy owned by the Director, Customer Service Operations - Rural. The intent of Corporate Policy P226 is to restrict a Customer Service Order to minor modifications to the distribution system which are needed to provide adequate service to customers, and can be built to Manitoba Hydro standards for 66kV and below.

If the scope of investment required to accommodate the customer request exceeds what is permitted in Corporate Policy P226, the responsibility for work is escalated to the Distribution Asset Management Department and the investment is funded from either the Commercial Services or Residential Subdivisions Programs.

BACKGROUND

The Overhead and Underground Connects - Small Scope Program is a variable scope program for investments created in the Common Sales Interface (CSI) by Customer Service Centre (CSC) staff, in response to requests from commercial land developers and/or individual commercial/industrial customers for new or expanded electric service through their service representative in the Marketing & Sales Division. These investments are not identified during the Manitoba Hydro capital planning cycle, rather are driven by external customer needs. More than 12,000 Customer Service Orders are issued each year. Investments are relatively small in size, generally less than $10K, and typically take less than a month to complete. The work orders for these investments are completed by CSC staff making use of the sealed Manitoba Hydro standards for 66kV and below, allowing for design and construction activity to be decentralized and completed by numerous CSC staff across the province. A standard pricing schedule and service extension policy is applied in order to determine if a customer contribution is required. Capital investments are non-discretionary.

Approval for originating Customer Service Orders against this Program prior to commencement of construction has been delegated by the Director to the Customer Service Centre Supervisor.

The process for the lifecycle of a Customer Service Order is as follows:

1. Receive request for Customer Service Order.
2. Refer to Types of Work Covered by a Class "A" and "B" Customer Service Order—Electric (P226) to determine if the work is covered by a type "A" or "B" Customer Service Order. These types may be applied to "Permanent and Temporary" applications. If the work is a Class "A" or "B", obtain any MTS joint use, easement, or other permit requirements as outlined in Obtaining Rights to do Work (P291), and ensure the corresponding Electric and/or Natural Gas Facilities Locate (eForm 0371) has been completed.

BACKGROUND

3. For customer initiated requests, provide the customer with a Letter, Conditions and Application for Electric/Gas Service - Residential (eForm 1901R) / Commercial (eForm 1901A).
4. Create all orders with the Customer Service Interface (CSI) using Customer Service Operations Work Order Process, Customer Policy Application and Customer Service Quotation Schedule as a guideline.
5. Refer to Classification and Disposal of Salvage, Surplus and Unserviceable Goods (P476) for material management processing.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

The Overhead and Underground Connects - Small Scope Program is a collection of Class A and Class B Customer Service Orders that provide the Customer Service Operations Divisions within the Marketing & Customer Service Operating Group the agility required to respond in a timely manner to customer requests throughout the year.

Customer requirements become part of the Overhead and Underground Connects Small Scope program after the customer has complied with all relevant Manitoba Hydro policies, terms and conditions which specify agreed-to items such as contribution requirements and in-service dates. The net benefit or cost for Connection Services is determined by these policies, terms and conditions and not by the program; as such Corporate Value Framework (CVF) scoring is not calculated. When a customer and Manitoba Hydro agree to the terms under the Service Extension Agreement, a contract exists with agreed upon in-service dates. Related investments to honour such agreements are provided a high priority within the operating group's investment portfolio.

The technical requirements for each investment to accommodate the individual customer's need is documented, reviewed and approved within the Common Sales Interface. Corporate Policy P225 outlines the approval for originating Customer Service Orders. The Customer Service Centre Supervisor approves the work orders prior to construction.

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget	Value	Value/ $K
Minimum	$11,100	N/A	N/A
Maximum	$15,700	N/A	N/A

PROGRAM RISK ANALYSIS

There are no unusual or special risks associated with proceeding with these investments as recommended.

IMPACT ON O&A COSTS	
Increased O&A costs will be incurred associated with energy metering and Customer Service Operations support activities, etc., associated with increasing the size of the electrical distribution system and the additional customers being supplied.	

RELATED INVESTMENTS
None.

OTHER ALTERNATIVES CONSIDERED
The least cost alternative capable of meeting the customer request is identified to proceed; other alternatives are not considered.

REFERENCE DOCUMENTS
None.

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Commercial Services - Winnipeg

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$7,636 to $14,424
CONTRIBUTIONS RANGE (ANNUAL):	($3,136) to ($5,924)
NET BUDGET RANGE (ANNUAL):	$4,500 to $8,500
	(values listed above are in thousands of dollars)
CORPORATE VALUE FRAMEWORK SCORE: (CVF score not required for Customer Service investments)	**Value:** N/A **Value/$K** N/A

DATE PREPARED: 2018/11/09

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Steele, Chuck	DIRECTOR OF ENGINEERING & CONSTRUCTION/ACTING VP MARKETING & CUSTOMER SERVICE		Director - Engineering & Construction	2018/12/21
Braid, Kristin	DISTRIBUTION ASSET MANAGEMENT DEPT MGR		Planning, Protection & Asset Strategy	2018/12/21
LAWRIE, SARAH	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2018/12/21
Cooke, Jim	CAPITAL PLANNING SECTION HEAD		Planning, Protection & Asset Strategy	2018/12/11

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Marketing & Customer Service	**REQUESTING OPERATING/CORPORATE GROUP:**	Marketing & Customer Service
RESPONSIBLE DIVISION:	Engineering & Construction	**REQUESTING DIVISION:**	Engineering & Construction
RESPONSIBLE DEPARTMENT:	Distribution Asset Management		
I.M. NODE NUMBER:	2.1.40.25.01.2	**W.B.S. NUMBERs:**	B:00330
C55 INVESTMENT CODE:	13479		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**PROGRAM TYPE**:	Variable Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C1 / Capacity & Growth (Level 2) CG / Customer Connections -Residential Commercial Industrial		

CONTACTS			
PREPARED BY:	Cooke, Jim CAPITAL PLANNING SECTION HEAD 52465	**REQUESTOR:**	Braid, Kristin MANAGER DISTRIBUTION ASSET MANAGEMENT 52465
PROJECT MANAGER:	Sawhney, Harinder WINNIPEG PLANNING SECTION HEAD 52465		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Commercial Services - Winnipeg

RECOMMENDATION

Approve an annual budget range (gross of contributions) of $7.6M to $14.5M for the Commercial Services – Winnipeg program, which includes smaller investments typically less than $1.0M. This program is required to respond to external Commercial and Industrial customer requests for new or expanded electrical service (66kV and below) within the City of Winnipeg.

The budget range reflects the minimum and maximum investment levels experienced over the previous three years, with contributions received from customers forecasted from $3.1M to $5.9M.

SCOPE

The scope of work for commercial service investments inside the City of Winnipeg may include:

- 66kV supply to large customers,
- Distribution primary supply,
- Underground supply to padmounted transformation,
- Overhead supply to pole-mounted transformation.

Feeder extensions necessary to reach the customers property, as well as minor modifications to the electric network such as protective device upgrades may also be required.

The Commercial Services – Winnipeg program does not include:

- Class A and Class B Customer Service Orders, which are defined in Corporate Policy P226 and restrict Customer Service Orders to minor modifications to the distribution system. Such investments are funded through the Overhead and Underground Connects - Small Scope program.
- More extensive modifications, that should be completed to ensure ongoing quality of electric supply for all customers but are not immediately necessary to provide supply for a specific customer request, and could jeopardize the customer's requested in service date. Such investments should be funded separately through the Voltage and Capacity - Winnipeg program.

BACKGROUND

The Commercial Services - Winnipeg program is a variable scope program for investments created by Engineering & Construction Division staff in response to requests from commercial land developers and/or individual commercial/industrial customers for new or expanded electric service through their service representative in the Marketing & Sales Division. A detailed pricing estimate is prepared for each customer request by Marketing & Sales staff, and the service extension policy is applied in order to determine if a customer contribution is required prior to commencing with the required capital investment. These investments are typically not identified during the Manitoba Hydro capital planning cycle, rather are driven by external customer needs.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

The Commercial Services - Winnipeg program is a variable scope program that provides the Marketing & Customer Service Operating Group the agility required to respond to customer requests in a timely manner throughout the year.

Customer requirements become part of the respective program after the customer has complied with all relevant Manitoba Hydro policies, terms and conditions which specify agreed-to items such as contribution requirements and in service dates. The net benefit or cost for Connection Services is determined by these policies, terms and conditions and not by the program or project; as such Corporate Value Framework (CVF) scoring is not calculated. When a customer and Manitoba Hydro agree to the terms under the Service Extension Agreement, a contract exists with agreed upon in service dates. Related investments to honour such agreements are provided a high priority within the operating group's investment portfolio.

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget*	Value	Value/ $K
Maximum	$8,500	N/A	N/A
Minimum	$4,500	N/A	N/A

**Net of contributions*

PROGRAM RISK ANALYSIS

Project management risk is unique to each program item that will be raised. Each program item will address the project management risk appropriately.

IMPACT ON O&A COSTS

Increased costs will be incurred associated with energy metering and Customer Service Operations support activities, etc., associated with increasing the size of the electrical distribution system and additional customers being supplied.

RELATED INVESTMENTS

None.

OTHER ALTERNATIVES CONSIDERED

The least cost alternative capable of meeting the customer request is identified to proceed; other alternatives are not considered.

REFERENCE DOCUMENTS

None.

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Commercial Services - Rural

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$5,245 to $12,050
CONTRIBUTIONS RANGE (ANNUAL):	($1,545) to ($3,550)
NET BUDGET RANGE (ANNUAL):	$3,700 to $8,500
	(values listed above are in thousands of dollars)
CORPORATE VALUE FRAMEWORK SCORE: (CVF score not required for Customer Service investments)	**Value:** N/A **Value/$K:** N/A

DATE PREPARED: 2018/11/09

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Steele, Chuck	DIRECTOR OF ENGINEERING & CONSTRUCTION/ACTING VP MARKETING & CUSTOMER SERVICE		Director - Engineering & Construction	2018/12/21
Braid, Kristin	DISTRIBUTION ASSET MANAGEMENT DEPT MGR		Planning, Protection & Asset Strategy	2018/12/21
LAWRIE, SARAH	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2018/12/21
Cooke, Jim	CAPITAL PLANNING SECTION HEAD		Planning, Protection & Asset Strategy	2018/12/11

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Marketing & Customer Service	**REQUESTING OPERATING/CORPORATE GROUP:**	Marketing & Customer Service
RESPONSIBLE DIVISION:	Engineering & Construction	**REQUESTING DIVISION:**	Engineering & Construction
RESPONSIBLE DEPARTMENT:	Distribution Asset Management		
I.M. NODE NUMBER:	2.1.40.25.01.1	**W.B.S. NUMBERs:**	B:00329
C55 INVESTMENT CODE:	13478		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**PROGRAM TYPE**:	Variable Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C1 / Capacity & Growth (Level 2) CG / Customer Connections -Residential Commercial Industrial		

CONTACTS			
PREPARED BY:	Cooke, Jim CAPITAL PLANNING SECTION HEAD 52465	**REQUESTOR:**	Braid, Kristin MANAGER DISTRIBUTION ASSET MANAGEMENT 52465
PROJECT MANAGER:	Johnson, Troy RURAL PLANNING & PROTECTION SECTION HEAD 52465		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Commercial Services - Rural

RECOMMENDATION

Approve an annual budget range (gross of contributions) of $5.3M to $12.0M for the Commercial Services – Rural program, which includes smaller investments typically less than $1.0M. This program is required to respond to external Commercial and Industrial customer requests for new or expanded electrical service (66kV and below) outside the City of Winnipeg.

The budget range reflects the minimum and maximum investment levels experienced over the previous three years, with contributions received from customers forecasted from $1.6M to $3.6M.

SCOPE

The scope of work for commercial service investments outside the City of Winnipeg may include:

- 66kV supply to large customers,
- Distribution primary supply,
- Underground supply to padmounted transformation,
- Overhead supply to pole-mounted transformation.

Feeder extensions necessary to reach the customers property, as well as minor modifications to the electric network such as protective device upgrades may also be required.

The Commercial Services – Rural program does not include:

- Class A and Class B Customer Service Orders, which are defined in Corporate Policy P226 and restrict Customer Service Orders to minor modifications to the distribution system. Such investments are funded through the Overhead and Underground Connects - Small Scope program.
- More extensive modifications, that should be completed to ensure ongoing quality of electric supply for all customers but are not immediately necessary to provide supply for a specific customer request, and could jeopardize the customer's requested in service date. Such investments should be funded separately through the Voltage and Capacity - Rural program.

BACKGROUND

The Commercial Services - Rural program is a variable scope program for investments created by Engineering & Construction Division staff in response to requests from commercial land developers and/or individual commercial/industrial customers for new or expanded electric service through their service representative in the Marketing & Sales Division. A detailed pricing estimate is prepared for each customer request by Marketing & Sales staff, and the service extension policy is applied in order to determine if a customer contribution is required prior to commencing with the required capital investment. These investments are typically not identified during the Manitoba Hydro capital planning cycle, rather are driven by external customer needs.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

The Commercial Services - Rural program is a variable scope program that provides the Marketing & Customer Service Operating Group the agility required to respond to customer requests in a timely manner throughout the year.

Customer requirements become part of the respective program after the customer has complied with all relevant Manitoba Hydro policies, terms and conditions which specify agreed-to items such as contribution requirements and in service dates. The net benefit or cost for Connection Services is determined by these policies, terms and conditions and not by the program or project; as such Corporate Value Framework (CVF) scoring is not calculated. When a customer and Manitoba Hydro agree to the terms under the Service Extension Agreement, a contract exists with agreed upon in service dates. Related investments to honour such agreements are provided a high priority within the operating group's investment portfolio.

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget*	Value	Value/ $K
Minimum	$3,700	N/A	N/A
Maximum	$8,500	N/A	N/A

**Net of contributions*

PROGRAM RISK ANALYSIS

Project management risk is unique to each program item that will be raised. Each program item will address the project management risk appropriately.

IMPACT ON O&A COSTS

Increased costs will be incurred associated with energy metering and Customer Service Operations support activities, etc., associated with increasing the size of the electrical distribution system and additional customers being supplied.

RELATED INVESTMENTS

None.

OTHER ALTERNATIVES CONSIDERED

The least cost alternative capable of meeting the customer request is identified to proceed; other alternatives are not considered.

REFERENCE DOCUMENTS

None.

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Electric Meters

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$5,000 to $8,500
CONTRIBUTIONS RANGE (ANNUAL):	$0 to $0
NET BUDGET RANGE (ANNUAL):	$5,000 to $8,500
(values listed above are in thousands of dollars)	
CORPORATE VALUE FRAMEWORK SCORE: (CVF scores reflect the Recommended alternative)	**Value:** 341,567 **Value/$K:** 3.86

DATE PREPARED: 2018/12/14

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Morrison, Lois	DIRECTOR MARKETING & SALES/ACTING VP MARKETING & CUSTOMER SERVICE		Director - Marketing & Sales	2019/01/25
Chard, Paul	DIRECTOR CUSTOMER CARE		Director - Customer Care	2018/12/18
Buchberger, Trevor	CUST METERING & ELEC CODES DEPT MANAGER		Customer Metering	2018/12/18
LAWRIE, SARAH	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2018/12/18
Isaac, Rob	DISTRIBUTION CAPITAL & RISK MGMT ADVISOR		Planning, Protection & Asset Strategy	2018/12/17

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Marketing & Customer Service	**REQUESTING OPERATING/CORPORATE GROUP:**	Marketing & Customer Service
RESPONSIBLE DIVISION:	Customer Care	**REQUESTING DIVISION:**	Customer Care
RESPONSIBLE DEPARTMENT:	Customer Metering & Inspections		
I.M. NODE NUMBER:	2.1.40.25.12.1	**W.B.S. NUMBERs:**	B:00336
C55 INVESTMENT CODE:	13507		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**PROGRAM TYPE**:	Common Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C1 / Capacity & Growth (Level 2) CG / Customer Connections -Residential Commercial Industrial		

CONTACTS			
PREPARED BY:	Buchberger, Trevor CUST METERING & ELEC CODES DEPT MANAGER 55320	**REQUESTOR:**	
PROJECT MANAGER:	Buchberger, Trevor CUST METERING & ELEC CODES DEPT MANAGER 55320		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Electric Meters

RECOMMENDATION

Approve an annual budget range of $5.0M to $8.5M for the Electric Meters program which includes smaller investments typically less than $1.0M. This program is required to install new meters, and to replace existing meters to ensure Manitoba Hydro maintains compliance with Measurement Canada regulations.

SCOPE

Manitoba Hydro requires meters to serve approximately 575,000 customers, and approximately 8,500 new customers (+1%) each year.

The scope of work for the Electric Meters program includes:

- Sampling a selected group of meters and replacement of meters if necessary based on test results of the samples,
- Metering additions to serve new customers.

Approximately 40% of the budget for this program is for new meter purchases and parts required for meter refurbishment, the balance is primarily for internal labour and associated motor vehicle costs for field staff.

BACKGROUND

Manitoba Hydro is accredited by Measurement Canada to conduct compliance sampling under specification *S-S-06 - Sampling Plans for the Inspection of Isolated Lots of Meters in Service*. Manitoba hydro follows Measurement Canada sampling inspection procedures and specifications and conducts an annual meter compliance program to extend the seal period of meters in-service. Compliance sampling results can vary significantly from year to year due to a variety of factors resulting in a wide range of required annual meter replacements.

Over the last five years, the volume of meters replaced in order to comply with regulations ranged from 18,000 to 32,000. New customer meter additions are relatively stable from year to year.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

Manitoba Hydro is required to be compliant with all Measurement Canada regulations in order to sell electricity in Canada. The consequences associated with not adhering to these regulations poses as a significant financial risk for the corporation with the potential of daily fines of several thousand dollars per meter per day requiring exchange. In addition the corporation would experience loss in customer confidence regarding Manitoba Hydro's ability to accurately measure customer consumption, which would further result in customer billing issues.

The budget range for this program considers recent investment requirements as well as short-term projections for:

- Ensuring compliance with Measurement Canada regulations required for meter exchanges, and
- Additions for new customers.

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget	Value	Value/ $K
Minimum	$5,000		
Maximum	$8,500		

PROGRAM RISK ANALYSIS

There is a risk that compliance sampling results may result in potential annual meter replacements beyond the volume represented by the $8.5M maximum investment threshold identified for this program. Given the significance of financial penalties for non-compliance, other investments within the M&CS Electric Capital portfolio would need to be adjusted in either timing or scope to accommodate the increased requirements of this program.

IMPACT ON O&A COSTS

Increased operating and maintenance costs will be incurred associated with meter reading, customer service support activities, etc. associated with the additional customers being supplied.

RELATED INVESTMENTS

Expenditures associated with the purchase of new meters is included in this program; however, the expenditures associated with the installation of the new meter, along with other required customer service extension expenditures, are part of the applicable customer service Residential or Commercial Services program.

OTHER ALTERNATIVES CONSIDERED

No other alternatives were considered.

REFERENCE DOCUMENTS

None.

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Fleet Acquisitions Program

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$12,000 to $18,000
CONTRIBUTIONS RANGE (ANNUAL):	$0 to $0
NET BUDGET RANGE (ANNUAL):	$12,000 to $18,000
(values listed above are in thousands of dollars)	
CORPORATE VALUE FRAMEWORK SCORE:	**Value:** N/A **Value/$K:** N/A

DATE PREPARED: 2018/12/18

EC/MHEB APPROVAL MINUTE & DATE: CAMEC-January 22/19

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
LUCE, Bryan	VP HR & CORPORATE SERVICES		VP Human Resources & Corporate Services	2019/01/03
IRELAND, BRAD	DIRECTOR CORPORATE SERVICES		Director - Corporate Service	2019/01/03
Gray, Doug	FLEET SERVICES DEPARTMENT MANAGER		Fleet Admin	2019/01/02
BATTISTONI, ANGELO	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2018/12/20
FUNK, Michelle	BUSINESS SYSTEMS ANALYST		Portfolio Management	2018/12/19

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Human Resources & Corporate Services	**REQUESTING OPERATING/CORPORATE GROUP:**	Human Resources & Corporate Services
RESPONSIBLE DIVISION:	Corporate Services	**REQUESTING DIVISION:**	Corporate Services
RESPONSIBLE DEPARTMENT:	Fleet Services		
I.M. NODE NUMBER:	2.1.10.25.11.1	**W.B.S. NUMBERs:**	B:00353
C55 INVESTMENT CODE:	15910		
SAP PROJECT TYPE:	23 - BOC-Corporate Asset Mgmt Exec Committee	**PROGRAM TYPE:**	Common Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C6 / Business Operations Support (Level 2) CT / Corporate Infrastructure Sustainment		

CONTACTS			
PREPARED BY:	SAM, Joanne SENIOR PLANNER 50841	**REQUESTOR:**	SMILSKI, Sandra (HRCS Portfolio Manager)
PROJECT MANAGER:	Gray, Doug FLEET SERVICES DEPARTMENT MANAGER 53155		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Fleet Acquisitions Program

RECOMMENDATION

Approve between $12 million to $18 million for the Fleet Acquisitions for common scope program. The collection of investments will be related to managing the corporation's fleet of vehicles, ensuring Manitoba Hydro staff have safe, reliable and environmentally sound vehicles to conduct day-to-day business operations.

SCOPE

Investments include additions, replacements or upgrades to the corporation's fleet of vehicles which include but are not limited to:

- diggers
- forklifts
- light and medium duty trucks
- aerial ladders
- trailers
- boats
- snowmobiles/quads

Investments can include but are not limited to :

- upgrades to equipment or vehicles
- replacement of equipment or vehicles that are nearing or past their useful life
- replacement or purchase of equipment or vehicles to meet equipment specifications or business needs
- fleet equipment or vehicle-related technologies that contribute to efficient operations and safety
- disposal or sale of retired or surplus vehicles and equipment

BACKGROUND

Manitoba Hydro Fleet Services is assigned the overall responsibility for managing the corporation's fleet of vehicles. Fleet Services works in partnership with Operating / Corporate Groups via the Fleet Governance Council to efficiently and effectively deliver fleet requirements. The Fleet Acquisitions program was established to provide Manitoba Hydro staff with safe, reliable, economical and environmentally sound vehicles.

Fleet Services will recommend equipment and vehicles for upgrades, or replacement by fleet guidelines and procedures:

- equipment and vehicle specifications
- equipment and vehicle replacement schedules
- existing inventory of acquired vehicles and equipment
- guidelines for reassigning, replacing or disposing of vehicles and equipment

The corporation manages a fleet of 3,295 core assets.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

The Fleet Acquisition program contributes to ensuring fleet related equipment and vehicles are managed by the corporation in a safe, reliable and environmentally responsible manner. Managing purchases as a fleet minimizes unit downtime and increase reliability so that staff productivity is not negatively impacted, reduced repair costs, mitigating safety risk by ensuring vehicles are safe for operation. The corporation's fleet assets are ageing. Approximately $43 million of our fleet assets has reached the end of their useful life.

The C55 Analytics module has recently been introduced for fleet investments. The C55 module will be used to plan approximately 75% of the fleet replacement in the current year as some of the longer lead time assets have already been ordered. As the analytics module matures, it will be used to prioritize the majority of investments within this program. Work is prioritized by assessing the value attached to the various types of fleet equipment or vehicles, with consideration for its age, usage, condition, and replacement cycle. A small portion of the program is reserved to address emergency items.

Investments are approved by the Fleet Acquisitions Program Manager or responsible department manager (or delegate).

The minimum and maximum budget range has been identified based on historical experience recognizing the size and volume of work may fluctuate annually based on various factors. Some of the factors that would influence the budget range are changes to equipment, vehicle specifications or replacement schedules and to reflect the potential variation in cost required to replace fleet assets past end of life where maintenance cost exceeds the value of the existing equipment and replacement is required.

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget	Value	Value/ $K
Minimum	$12,000	N/A	N/A
Maximum	$18,000	N/A	N/A

PROGRAM RISK ANALYSIS

This collection of investments may result in the following risks:
- Costs and schedule changes due to unforeseen circumstances (e.g. lead time on specialized vehicles can take up to 18 months from ordering to delivery, significant time required to identify corporate vehicle requirements and the ability to place orders in a timely fashion).
- Unavailability of vehicles in the marketplace that satisfies requested equipment and vehicle specifications.

IMPACT ON O&A COSTS

The type and age of vehicles may impact the costs associated with the vehicle and equipment repair and maintenance.

RELATED INVESTMENTS

Not applicable.

OTHER ALTERNATIVES CONSIDERED

Not applicable.

REFERENCE DOCUMENTS

C55-CIJ-PROG-AD

CAPITAL INVESTMENT JUSTIFICATION ADDENDUM FOR

Fleet Acquisitions Program

Investment Type (Program)

Addendum Number 1

	PREVIOUSLY APPROVED	REVISED	INCREASE/ (DECREASE)
BUDGET RANGE (Annual):	$12,000 to $18,000	$12,000 to $25,000	$0 to $7,000
CONTRIBUTIONS RANGE (Annual):	$0 to $0	$0 to $0	$0 to $0
NET BUDGET RANGE(Annual):	$12,000 to $18,000	$12,000 to $25,000	$0 to $7,000
			(values listed above are in thousands of dollars)
CORPORATE VALUE FRAMEWORK SCORE:	**Value:** N/A	**Value:** N/A	
	Value/$K: N/A	**Value/$K:** N/A	
			(CVF scores reflect the Recommended alternative)

DATE PREPARED: 2019/11/20

EC/MHEB APPROVAL MINUTE & DATE: Approved at CAMEC December 18, 2019

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Harrald, Sharon	VP HR & CORPORATE SERVICES		VP Human Resources & Corporate Services	2019/11/25
Ireland, Brad	DIRECTOR CORPORATE SERVICES		Director - Corporate Service	2019/11/21
Battistoni, Angelo	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2019/11/21
Funk, Michelle	BUSINESS SYSTEMS ANALYST		Portfolio Management	2019/11/20

ADDENDUM NUMBER	DATE	REVISION (Summary of change)
1	2019/11/20	Previously approved budget insufficient to address fleet assets that have exceeded the end of life

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Human Resources & Corporate Services	**REQUESTING OPERATING/CORPORATE GROUP:**	Human Resources & Corporate Services
RESPONSIBLE DIVISION:	Corporate Services	**REQUESTING DIVISION:**	Corporate Services
RESPONSIBLE DEPARTMENT:	Fleet Services		
I.M. NODE NUMBER:	2.1.10.25.11.1	**W.B.S. NUMBERs:**	B:00353
C55 INVESTMENT CODE:	15910		
SAP PROJECT TYPE:	23 - BOC-Corporate Asset Mgmt Exec Committee	**C55 INVESTMENT SUB-CATEGORY**:	
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C6 / Business Operations Support (Level 2) CT / Corporate Infrastructure Sustainment		

CONTACTS			
PREPARED BY:	Windsor, Regan BUSINESS ENABLEMENT DEPARTMENT MANAGER 50492	**REQUESTOR:**	SMILSKI, Sandra (HRCS Portfolio Manager)
PROJECT MANAGER:	Gray, Doug FLEET SERVICES DEPARTMENT MANAGER 53155		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Fleet Acquisitions Program

RECOMMENDATION

Approve an increase of $7 million from a previously approved maximum program budget of $18 million to address the significant number of Fleet units that have exceeded the end of life. The currently approved program budget is not sufficient due to:

- An increase in Fleet replacement requirements since program creation, and
- The lifespan of some Fleet units, particularly heavy equipment, are requiring significant repairs earlier in their lifespan. A review is underway that will likely result in a reduction to asset useful life.

SCOPE

There is no change to scope.

BACKGROUND

Manitoba Hydro is currently assessing the economic life cycle of its Fleet Assets. With a significant portion of its assets, especially specialized heavy equipment reaching or exceeding the end of life, an assessment of maintenance costs, as well as the cost of having the equipment out of service (delays to projects, crew downtime, etc.), has been undertaken. It is anticipated this reduced life cycle for equipment will put additional strain on an already strained Fleet budget.

Manitoba Hydro Fleet Services is assigned the overall responsibility for managing the corporation's fleet of vehicles. Fleet Services works in partnership with Operating / Corporate Groups via the Fleet Governance Council to ensure the efficient and effective delivery of fleet acquisitions. The Fleet Acquisitions program was established to provide Manitoba Hydro staff with safe, reliable, economical and environmentally sound vehicles.

Fleet Services will recommend equipment and vehicles for upgrades, maintenance or replacement in accordance with fleet guidelines and procedures:

- equipment and vehicle specifications
- equipment and vehicle replacement schedules
- the existing inventory of acquired vehicles and equipment
- guidelines for reassigning, replacing or disposing of vehicles and equipment

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

All program items collectively contribute to ensuring fleet-related equipment and vehicles managed by the corporation are safe, reliable and environmentally sound to conduct day-to-day business operations. Value can be derived from Capital and O&M financial benefits achieved through minimizing unit downtime and increasing reliability so that staff productivity is not negatively impacted, reduced repair costs, mitigating safety risk by ensuring vehicles are safe for operation. The corporation's fleet assets are ageing; approximately $48.4 million of our fleet assets have reached the end of their useful life.

In addition to the portion of Manitoba Hydro's Fleet (20%) that have exceeded their useful life, a further $37.6 million (14%) are approaching the end of life (between 75% and 99%). At the current program levels, $15-$18 million annually Manitoba Hydro is not keeping up with critical replacements; this is resulting in increases in repair and maintenance costs and impacts operational projects and the ability to respond to customers due to downed equipment. A significant percentage (65%) of the end of life equipment is specialized construction equipment that is not readily available for rental. To address the existing and upcoming Fleet assets that are at or exceeding the end of life additional budget is required over the next several years.

The C55 Analytics module has recently been introduced for fleet investments. The C55 module will be used to plan approximately 75% of the fleet replacement in the current year as some of the longer lead time assets have already been ordered. As the analytics module matures, it will be used to prioritize the majority of investments within this program. Work is prioritized by assessing the value attached to the various types of fleet equipment or vehicles, with consideration for its age, usage, condition, and replacement cycle. A small portion of the program is reserved for addressing emergency items.

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Fleet Acquisitions Program

PROGRAM ALTERNATIVES

PREVIOUSLY APPROVED			PROPOSED			INCREASE / (DECREASE)
Alternative Name	Annual Budget	Value	Value/ $K	Annual Budget	Value	Value/ $K	Annual Budget
Maximum	$18,000			$25,000			$7,000
Minimum	$12,000			$12,000			0

PROGRAM RISK ANALYSIS

This collection of investments may result in the following risks:

- Costs and schedule changes due to unforeseen circumstances (e.g. lead time on specialized vehicles can take up to 18 months from ordering to delivery, the significant time required to identify corporate vehicle requirements and the ability to place orders in a timely fashion)
- Unavailability of vehicles in the marketplace that satisfies requested equipment and vehicle specifications

IMPACT ON O&A COSTS

The collection of investments may increase / decrease costs associated with:

- Vehicle and equipment repair and maintenance costs. It is anticipated that maintenance costs will decrease once Fleet assets reaching the end of life have been replaced. Also, the revised economic end of life calculations may result in further reductions in maintenance costs.

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Fleet Acquisitions Program

RELATED INVESTMENTS
Not applicable.

OTHER ALTERNATIVES CONSIDERED
Not applicable.

REFERENCE DOCUMENTS
15910_CIJ_PRG_Fleet Acquisitions Program.docx

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Facilities Capital Upgrade Program

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$2,500 to $10,000
CONTRIBUTIONS RANGE (ANNUAL):	$0 to $0
NET BUDGET RANGE (ANNUAL):	$2,500 to $10,000
(values listed above are in thousands of dollars)	
CORPORATE VALUE FRAMEWORK SCORE:	**Value:** N/A **Value/$K:** N/A

DATE PREPARED: 2018/12/18

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
LUCE, Bryan	VP HR & CORPORATE SERVICES		VP Human Resources & Corporate Services	2018/12/21
IRELAND, BRAD	DIRECTOR CORPORATE SERVICES		Director - Corporate Service	2018/12/20
SACHVIE, DARREN	CORPORATE FACILITIES & SECURITY DEPT MGR		Dept Manager - Corporate Facilities	2018/12/20
BATTISTONI, ANGELO	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2018/12/20
FUNK, Michelle	BUSINESS SYSTEMS ANALYST		Portfolio Management	2018/12/19

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Human Resources & Corporate Services	**REQUESTING OPERATING/CORPORATE GROUP:**	Human Resources & Corporate Services
RESPONSIBLE DIVISION:	Corporate Services	**REQUESTING DIVISION:**	Corporate Services
RESPONSIBLE DEPARTMENT:	Corporate Facilities and Security		
I.M. NODE NUMBER:	2.1.10.25.10.1	**W.B.S. NUMBERs:**	B:00348
C55 INVESTMENT CODE:	15895		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**PROGRAM TYPE:**	Variable Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C6 / Business Operations Support (Level 2) CT / Corporate Infrastructure Sustainment		

CONTACTS			
PREPARED BY:	SAM, Joanne SENIOR PLANNER 50841	**REQUESTOR:**	SMILSKI, Sandra (HRCS Portfolio Manager)
PROJECT MANAGER:	SACHVIE, DARREN CORPORATE FACILITIES & SECURITY DEPT MGR 50215		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Facilities Capital Upgrade Program

RECOMMENDATION

Approve between $2.5 million to $10 million for the Facilities Capital Upgrade Program for variable scope investments with smaller facility investments typically less than $1 million. The collection of investments will vary from repair and maintenance of buildings to the construction of new smaller buildings. The program is intended to ensure that buildings managed by the Corporate Facilities Department are appropriately maintained while balancing repair and maintenance costs with replacements or additions.

SCOPE

Investments include repairs, upgrades, replacements or additions to the corporation's approximately 140 buildings that are managed by the Corporate Facilities Department. These buildings typically accommodate administrative staff (e.g. 360 Portage Avenue) and exclude other specialty buildings (e.g. generating stations) that are maintained by the corporation. Investments can include but are not limited to:

- roof repair or replacements
- HVAC repair or replacements
- plumbing or cooling system repair or replacements
- office renovations
- constructing a new smaller building

BACKGROUND

Program items within this program support the corporation's commitment to appropriately maintain buildings that accommodate administrative staff that are managed by the Corporate Facilities Department. Buildings need regular maintenance and renovations completed promptly to ensure the building condition is at an acceptable level and protecting the useable lifespan of these buildings. Consideration is also given to determine situations when replacement or construction of a new smaller building is a preferred alternative.

The Corporate Facilities Department manages approximately 140 buildings spread out across the province that accommodate administrative staff. The types of buildings include:

- Head Office
- Customer Service Centres, District Offices, Fleet Garages
- Operational Facilities throughout the province

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

Each program item within this program can vary significantly and will be justified on its own merits.
Managing repairs, upgrades, replacements or additions reduces maintenance and repair costs, mitigates financial

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

risk and prevents further damage to buildings (e.g. repairing a leaking roof that can result in damages to equipment housed in the building), improving working conditions (e.g. repairing or replacing HVAC, office renovations to mobility requirements), mitigating safety risk and compliance risk.

The prioritization of work in this program is based on the Corporate Facilities Condition Assessment rating program as well as the requirement to implement immediate capital repairs when unplanned or unforeseen building work becomes apparent. The Corporate Facilities Department conducts condition assessments of buildings and combines this information with typical replacement cycles to determine the relative priority of investments. Work will be executed based on assessed value, stakeholder priorities, resource availability and annual budget. There may be some unforeseen circumstances that may impact the relative priority of investments which includes: equipment failing earlier than expected or further work pursued at the same site to take advantage of savings or opportunities. Investments are approved by the Facilities Capital Upgrade Program Owner or appropriate department manager (or delegate).

The program range has been identified based on a combination of historical experience and the asset management plan recognizing the size and volume and work may fluctuate annually. The maximum budget range of $10 million reflects the optimal budget required to maintain buildings within the scope of this program appropriately; this has been validated by an external consulting firm that was previously engaged by Manitoba Hydro.

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget	Value	Value/ $K
Minimum	$2,500	N/A	N/A
Maximum	$10,000	N/A	N/A

PROGRAM RISK ANALYSIS

Program items will have different risks and will be assessed individually with details captured within each program item approval document.

The type and age of the investments may result in the following risks costs and schedule changes due to unforeseen circumstances (e.g. resource availability, back ordered materials, purchase of specialized parts).

IMPACT ON O&A COSTS

Each program item will impact O&A differently. Each program item and will be individually assessed with details captured within each program item approval document.

The type and age of the investments may impact the costs related to repair or maintenance costs, operating costs (e.g. energy efficient renovations can result in decreases due to reduced heating costs, construction of a new smaller facility can result in increases due to incremental property taxes).

RELATED INVESTMENTS

VFA Asset Management Tool

OTHER ALTERNATIVES CONSIDERED

Not applicable.

REFERENCE DOCUMENTS

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Computing Infrastructure

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$5,850 to $9,250
CONTRIBUTIONS RANGE (ANNUAL):	$0 to $0
NET BUDGET RANGE (ANNUAL):	$5,850 to $9,250
(values listed above are in thousands of dollars)	
CORPORATE VALUE FRAMEWORK SCORE:	**Value:** N/A **Value/$K:** N/A

DATE PREPARED: 2018/12/18

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
LUCE, Bryan	VP HR & CORPORATE SERVICES		VP Human Resources & Corporate Services	2018/12/21
LANYON, Rob	DIRECTOR INFORMATION TECHNOLOGY SERVICES		Director - IT Services Dept	2018/12/21
ARNAL, Marc	IT INFRASTRUCTURE SERVICES DEPT MANAGER		Director - IT Services Dept	2018/12/21
BATTISTONI, ANGELO	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2018/12/21
FUNK, Michelle	BUSINESS SYSTEMS ANALYST		Portfolio Management	2018/12/19

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Human Resources & Corporate Services	**REQUESTING OPERATING/CORPORATE GROUP:**	Human Resources & Corporate Services
RESPONSIBLE DIVISION:	Information Technology Services	**REQUESTING DIVISION:**	Information Technology Services
RESPONSIBLE DEPARTMENT:	IT Infrastructure Services		
I.M. NODE NUMBER:	2.1.10.25.21.1	**W.B.S. NUMBERs:**	B:00319
C55 INVESTMENT CODE:	13282		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**PROGRAM TYPE:**	Common Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C6 / Business Operations Support (Level 2) CT / Corporate Infrastructure Sustainment		

CONTACTS			
PREPARED BY:	SAM, Joanne SENIOR PLANNER 50841	**REQUESTOR:**	SMILSKI, Sandra (HRCS Portfolio Manager)
PROJECT MANAGER:	ARNAL, Marc IT INFRASTRUCTURE SERVICES DEPT MANAGER 50800		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Computing Infrastructure

RECOMMENDATION

Approve between $5.85 million to $9.25 million for the Computing Infrastructure common scope program. The collection of investments are related to the proactive replacement program of end-user and data centre software, hardware and equipment.

SCOPE

Investments include additions, replacements and upgrades to the corporation's computing infrastructure. Computing infrastructure can be broadly categorized as:

- End Point Computing (e.g. desktops, laptops, monitors, computer accessories)
- Printers (e.g. multifunctional devices, printer devices)
- Desktop Software (e.g. word processing software, spreadsheets, engineering tools, tax software)
- Data Centre Infrastructure (e.g. servers, networks, storage)

BACKGROUND

Program items help to ensure the reliability and availability of the corporation's computing infrastructure, which includes ensuring that it is properly secured against outside intrusion. Computing infrastructure needs to be proactively replaced to ensure that it can support current and future business needs while leveraging technological advances. The Information Technology Division is responsible for supporting a diverse computing infrastructure which consists of approximately:

- 4,000 desktops, laptops and monitors
- 350 tablets and handheld devices
- 180 printers and multifunctional printer devices
- 2,300 types of software products installed (excluding the various software versions)
- 1550 servers and two petabytes worth of storage

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

Program items collectively contribute to a proactive replacement of the corporation's computing infrastructure. The collective value of all investments typically is derived from mitigating the impact of business operations and delivery of service due to an outage or failure of a technology asset due to obsolescence or mitigating security risk (e.g. regularly applying patches to servers to minimize the risk of a cybersecurity breach).

As manufacturers discontinue support, which includes the availability of security patches, equipment is targeted for replacement. Where applicable, investments are made in alignment with industry best practice replacement cycles. Additional investments are also made to ensure the corporation's computing infrastructure meets current and future needs (e.g. replacing equipment when it no longer functions or meets business growth).

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

End Point Computing

- Reliable laptops, desktops, monitors, and computer accessories allow Manitoba Hydro staff to work effectively.
- Laptops and desktops are generally on a five-year replacement cycle.
- Monitors are targeted for replacement when beyond repair, typically five to seven years or when they no longer meet functional requirements.
- Monitor replacements can either be fulfilled through redeployment of existing equipment or new purchases.
- Computer accessories (e.g. earphones, keyboards, mice, cables, etc.) are replaced when they no longer operate or meet functional needs.

Printers

- Reliable multi-functional devices are required to meet the corporation's needs for printing, faxing and scanning capabilities.
- Printers are generally on a seven-year replacement cycle.

Desktop Software

- There is the need to continue to purchase new desktop software or version upgrades, which may result in the replacement/ retirement of existing software to meet existing and evolving needs identified by the various Operating and Corporate groups.
- End point computing replacements can result in requests for new desktop software.

Data Centre Infrastructure

- Servers, Networks and Storage are generally on a minimum five-year replacement cycle.
- Server infrastructure is one of the key components used to provision corporate enterprise applications such as SAP, electronic mail, outage management services, mobile workforce management and essentially all enterprise information technology applications.
- Network infrastructure consists of a local area network (LAN) within each of the Manitoba Hydro buildings across the province and the wide area network (WAN), which provides a connection between all Manitoba Hydro offices.
- The storage infrastructure consists of a storage area network (SAN) that resides in both IT data centers, with the data for enterprise applications stored in both locations. The SAN is an essential component that supports the provisioning of critical functionality such as electronic mail, outage management services, mobile workforce management and essentially all enterprise IT applications.
- In addition to replacement cycles, investments related to storage equipment are made to support growth. In recent years, the corporation has also seen annual growth of approximately 20% in storage usage.

The Data Centre Services Supervisor or IT Asset & Contract Management Supervisor are responsible for identifying potential investments. Work will be executed based on assessed value, stakeholder priorities, resource availability and annual budget. Investments are approved by the Computing Infrastructure Program Owner or Information Technology Infrastructure Services Department Manager (or delegate).

The minimum and maximum budget range has been identified based on historical experience, and the age of existing equipment recognizing the size and volume of work may fluctuate annually based on various factors. Some of the factors that would influence the budget range are newly identified needs that reflect stakeholder priorities, project schedule and technology dependencies (e.g. coordinate infrastructure upgrade with an application upgrade), technological advances, expiration dates of existing maintenance contracts, or other financial incentives offered by manufacturers.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget	Value	Value/ $K
Maximum	$9,250	N/A	N/A
Minimum	$5,850	N/A	N/A

PROGRAM RISK ANALYSIS

Although historically the investment on IT Infrastructure has been relatively consistent, cybersecurity concerns pose the greatest risk to scope, schedule and investment. There have been recent examples where security support for certain technologies has been discontinued, necessitating a more aggressive replacement schedule than originally planned.

IMPACT ON O&A COSTS

The collection of investments may result in an overall increase of O&A costs based on the following:

- Minimum impact of desktop software maintenance estimated to be is in excess of $10,000 annually
- Slight increase in hardware maintenance; historically newly acquired equipment carries a slightly higher maintenance cost

RELATED INVESTMENTS

Not applicable.

OTHER ALTERNATIVES CONSIDERED

Not applicable.

REFERENCE DOCUMENTS

C55-CIJ-PROG-AD

CAPITAL INVESTMENT JUSTIFICATION ADDENDUM FOR

Computing Infrastructure

Investment Type (Program)

Addendum Number 1

	PREVIOUSLY APPROVED	REVISED	INCREASE/ (DECREASE)
BUDGET RANGE (Annual):	$5,850 to $9,250	$5,850 to $12,000	0 to $2,750
CONTRIBUTIONS RANGE (Annual):	$0 to $0	$0 to $0	$0 to $0
NET BUDGET RANGE(Annual):	$5,850 to $9,250	$5,850 to $12,000	0 to $2,750
			(values listed above are in thousands of dollars)
CORPORATE VALUE FRAMEWORK SCORE:	**Value:** N/A	**Value:** N/A	
	Value/$K: N/A	**Value/$K:** N/A	

DATE PREPARED: 2019/11/21

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Harrald, Sharon	VP HR & CORPORATE SERVICES		VP Human Resources & Corporate Services	2019/11/26
Lanyon, Rob	DIRECTOR INFORMATION TECHNOLOGY SERVICES		Director - IT Services Dept	2019/11/22
Battistoni, Angelo	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2019/11/21
Funk, Michelle	BUSINESS SYSTEMS ANALYST		Portfolio Management	2019/11/21

ADDENDUM NUMBER	DATE	REVISION (Summary of change)
1	2019/11/20	Previously approved budget insufficient to fund software as a service agreements and highly variable annual expenditures related to end computing devices.

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Human Resources & Corporate Services	**REQUESTING OPERATING/CORPORATE GROUP:**	Human Resources & Corporate Services
RESPONSIBLE DIVISION:	Information Technology Services	**REQUESTING DIVISION:**	Information Technology Services
RESPONSIBLE DEPARTMENT:	IT Infrastructure Services		
I.M. NODE NUMBER:	2.1.10.25.21.1	**W.B.S. NUMBERs:**	B:00319
C55 INVESTMENT CODE:	13282		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**C55 INVESTMENT SUB-CATEGORY**:	
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C6 / Business Operations Support (Level 2) CT / Corporate Infrastructure Sustainment		

CONTACTS			
PREPARED BY:	Sam, Joanne SENIOR PLANNER 50841	**REQUESTOR:**	SMILSKI, Sandra (HRCS Portfolio Manager)
PROJECT MANAGER:	Arnal, Marc IT INFRASTRUCTURE SERVICES DEPT MANAGER 50800		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Computing Infrastructure

RECOMMENDATION

Approve an increase of $2.75 million from a previously approved maximum program budget of $9.25 million due to:

- changes in traditional on-premise software being delivered as software as a service agreement; recent interpretation in accounting policy has identified portions of these services as eligible capital expenditures
- need to adapt to highly variable annual expenditures related to end computing devices (e.g. hardware, equipment), which is affected by replacement cycles, technological advancements and unpredictable future requirements

SCOPE

The program scope will expand to fund eligible portions of software as a service agreements.

BACKGROUND

Vendors are increasingly offering software as a service arrangement instead of traditional on-premise software. This change, coupled with the recent interpretation of accounting policy, will impact the required capital to address the needs of the program. Microsoft has recently changed its delivery model of Office to a subscription-based service called Office 365. Office 365 is currently being deployed at Manitoba Hydro and will result in an estimated increase to the program budget of $1.2 million. There is the potential that Manitoba Hydro may engage in other software as a service arrangement as vendors provide different service delivery models in the future.

To meet the needs of the program, the overall program budget needs to be flexible to accommodate changes in the delivery of software as well as annual peaks and valleys in spending related to end computing devices.

Collectively program items within the Computing Infrastructure program help to ensure the reliability and availability of the corporation's computing infrastructure, which includes ensuring that it is properly secured against outside intrusion. Computing infrastructure needs to be proactively refreshed and replaced to ensure that it can support current and future business needs while leveraging technological advances.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

Program items collectively contribute to a proactive replacement of the corporation's computing infrastructure. The collective value of all investments typically is derived from mitigating the impact of business operations and delivery of service due to an outage or failure of a technology asset due to obsolescence or mitigating security risk (e.g. regularly applying patches to servers to minimize the risk of a cybersecurity breach).

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Computing Infrastructure

PROGRAM ALTERNATIVES

	PREVIOUSLY APPROVED			PROPOSED			INCREASE / (DECREASE)
Alternative Name	Annual Budget	Value	Value/ $K	Annual Budget	Value	Value/ $K	Annual Budget
Minimum	$5,850			$5,850			$0
Maximum	$9,250			$12,000			$2,750

PROGRAM RISK ANALYSIS

Although historically, the investment in IT Infrastructure has been relatively consistent, cybersecurity concerns pose the greatest risk to scope, schedule and investment. There have been recent examples where security support for certain technologies has been discontinued, necessitating a more aggressive replacement schedule than originally planned.

IMPACT ON O&A COSTS

While there is the potential O&A costs may increase as a result of this addendum, a minimal impact is anticipated.

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Computing Infrastructure

RELATED INVESTMENTS
Not applicable.

OTHER ALTERNATIVES CONSIDERED
Not applicable.

REFERENCE DOCUMENTS
13282_CIJ_PRG_Computing Infrastructure.docx

C55-CIJ-PROG-AD

CAPITAL INVESTMENT JUSTIFICATION ADDENDUM FOR

Computing Infrastructure

Investment Type (Program)

Addendum Number 2

	PREVIOUSLY APPROVED	REVISED	INCREASE/ (DECREASE)
BUDGET RANGE (Annual):	$5,850 to $12,000	$5,850 to $16,500	$0 to $4,500
CONTRIBUTIONS RANGE (Annual):	$0 to $0	$0 to $0	$0 to $0
NET BUDGET RANGE(Annual):	$5,850 to $12,000	$5,850 to $16,500	$0 to $4,500
			(values listed above are in thousands of dollars)
CORPORATE VALUE FRAMEWORK SCORE:	**Value:** N/A	**Value:** N/A	
	Value/$K: N/A	**Value/$K:** N/A	

DATE PREPARED: 2021-07-15

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Tess, Aurel	VP & CHIEF FINANCIAL OFFICER		VP Chief Financial Officer	2021-07-29
Fish, Ian	VP DIGITAL & TRANSFORMATION		VP Digital & Transformation	2021-07-15
Battistoni, Angelo	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2021-07-15
Funk, Michelle	BUSINESS SYSTEMS ANALYST		Portfolio Management	2021-07-15

ADDENDUM NUMBER	DATE	REVISION (Summary of change)
1	2019/11/20	Previously approved budget insufficient to fund software as a service agreements and highly variable annual expenditures related to end computing devices.
2	2021/06/16	Previously approved budget insufficient to fund replacement of MWM devices, accelerated replacement cycle of end point computing devices, and anticipated costs increases related to Microsoft Office 365.

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Digital & Transformation	**REQUESTING OPERATING/CORPORATE GROUP:**	Digital & Transformation
RESPONSIBLE DIVISION:	Information Technology Services	**REQUESTING DIVISION:**	Information Technology Services
RESPONSIBLE DEPARTMENT:	IT Infrastructure Services		
I.M. NODE NUMBER:	2.1.15.25.02.1	**W.B.S. NUMBERs:**	B:00319
C55 INVESTMENT CODE:	13282		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**C55 INVESTMENT SUB-CATEGORY**:	
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C6 / Business Operations Support (Level 2) CS / Information Technology		

CONTACTS			
PREPARED BY:	Sam, Joanne SENIOR PLANNER 56705	**REQUESTOR:**	SMILSKI, Sandra (D&T Portfolio Manager)
PROJECT MANAGER:	Harrison, Glen IT INFRASTRUCTURE SERVICES DEPT MANAGER 50800		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Computing Infrastructure

RECOMMENDATION

Approve an increase of $4.5 million from a previously approved maximum program budget of $12 million for a revised maximum program budget of $16.5 million due to:

- immediate requirement to replace all Mobile Workforce Management (MWM) devices with a newer model to address technology obsolescence and system compatibility issues. Future requirement also exists based on planned replacement cycle.
- accelerated replacement cycle for end point computing devices (e.g. laptops, desktops, monitors, and computer accessories) to ensure staff can continue to work effectively.
- anticipated increases related to existing Microsoft Office 365 subscription service.

SCOPE

The program scope will not change as a result of the addendum.

BACKGROUND

To meet the needs of the program, the overall program budget needs to be flexible to accommodate changes in the delivery of software as well as annual peaks and valleys in spending related to end point computing devices.

Collectively program items within the Computing Infrastructure program help to ensure the reliability and availability of the corporation's computing infrastructure, which includes ensuring that it is properly secured against outside intrusion. Computing infrastructure needs to be proactively refreshed and replaced to ensure that it can support current and future business needs while leveraging technological advances.

Manitoba Hydro supports approximately 630 MWM devices (TOUGHBOOKS, keyboards, and docking stations). These devices run on Windows 10 version 1909, an operating system that will be end of life in May of 2022. In addition, the current model of the devices (Panasonic CF31 MK5) is not compatible with a Microsoft supported operating system such as Windows 10 20H2 and beyond. Replacement of these devices with a newer model (e.g. Panasonic CF33 MK2) is required to address technology obsolescence and system compatibility issues. Future replacements of this magnitude will also be required based on an assumed four-year replacement cycle. These replacements will account for an estimated increase of approximately $5 million (plus PST).

In early FYE 2022, an external consultant completed an assessment of end point computing devices (e.g. laptops, desktops, monitors, and computer accessories) and a recommendation was made to advance the replacement cycle from five to four years to ensure staff can continue to work effectively. This change is estimated to result in an additional 200-300 device replacements per year, accounting for an increase of $400,000 to $500,000.

A previously approved addendum was required to fund Manitoba Hydro's decision to leverage Microsoft's subscription-based service Office 365. Office 365 has been deployed at Manitoba Hydro and historically, eligible capital costs account for an estimated $1.8 million (plus PST). Manitoba Hydro leverages negotiated pricing / contracts between Microsoft and the Province of Manitoba. These costs are anticipated to increase over time as

BACKGROUND

contracts and licensing features are re-negotiated to meet operational requirements.

The five-year average of previously forecasted program outlook (prior to these changes) was approximately $11.5M. The required capital funds to address the immediate need to replace all MWM devices alone will exceed the currently approved maximum program budget.

Looking forward, software and hardware vendors are offering cloud options to replace traditional on-premise solutions. The move to cloud computing in the form of XaaS (anything as a service) will result in a shift from historical capital spend to operating. This shift will be realized over the next three to five years for desktop software, servers, and storage requirements previously funded from this program.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

Program items collectively contribute to a proactive replacement of the corporation's computing infrastructure. The collective value of all investments typically is derived from mitigating the impact of business operations and delivery of service due to an outage or failure of a technology asset due to obsolescence or mitigating security risk (e.g. regularly applying patches to servers to minimize the risk of a cybersecurity breach).

The primary driver for this addendum is to obtain approval to fund the immediate replacement of all MWM devices with a model that is compatible with a supported operating system and mitigate current technology obsolescence risk. There is also a requirement to fund future replacements based on replacement cycle.

Additional contributing drivers for this addendum include ensuring there are enough funds to adopt a reduced replacement cycle for end point computing devices and allowing flexibility in the program to accommodate anticipated but unpredictable cost increases associated with Microsoft 365.

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Computing Infrastructure

PROGRAM ALTERNATIVES

	PREVIOUSLY APPROVED			PROPOSED			INCREASE / (DECREASE)
Alternative Name	Annual Budget	Value	Value/ $K	Annual Budget	Value	Value/ $K	Annual Budget
Maximum	$12,000			$16,500			$4,500
Minimum	$5,850			$5,850			$0

PROGRAM RISK ANALYSIS

Although historically the investment on IT Infrastructure has been relatively consistent, cyber security concerns pose the greatest risk to scope, schedule and investment. There have been recent examples where security support for certain technologies has been discontinued, necessitating a more aggressive replacement schedule than originally planned.

IMPACT ON O&A COSTS

While there is the potential O&A costs may increase as a result of this addendum, a minimal impact is anticipated.

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Computing Infrastructure

RELATED INVESTMENTS
Not applicable.

OTHER ALTERNATIVES CONSIDERED
Not applicable.

REFERENCE DOCUMENTS
13282_CIJ_PRG_Computing Infrastructure.docx
13282_CIJ_PRG_AD_Computing Infrastructure_1.docx

C55-CIJ-PROG

CAPITAL INVESTMENT JUSTIFICATION FOR

Emerging Information Technology

Investment Type (Program)

BUDGET RANGE (ANNUAL):	$1,300 to $8,800
CONTRIBUTIONS RANGE (ANNUAL):	$0 to $0
NET BUDGET RANGE (ANNUAL):	$1,300 to $8,800
(values listed above are in thousands of dollars)	
CORPORATE VALUE FRAMEWORK SCORE:	**Value:** N/A **Value/$K:** N/A

DATE PREPARED: 2018/12/18

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
LUCE, Bryan	VP HR & CORPORATE SERVICES		VP Human Resources & Corporate Services	2018/12/21
LANYON, Rob	DIRECTOR INFORMATION TECHNOLOGY SERVICES		Director - IT Services Dept	2018/12/21
MATIESHIN, Gwenda	CORPORATE INFO SYSTEMS DEPT MANAGER		Director - IT Services Dept	2018/12/19
BATTISTONI, ANGELO	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2018/12/19
FUNK, Michelle	BUSINESS SYSTEMS ANALYST		Portfolio Management	2018/12/18

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Human Resources & Corporate Services	**REQUESTING OPERATING/CORPORATE GROUP:**	
RESPONSIBLE DIVISION:	Information Technology Services	**REQUESTING DIVISION:**	
RESPONSIBLE DEPARTMENT:	Director - IT Services		
I.M. NODE NUMBER:	2.1.10.25.20.1	**W.B.S. NUMBERs:**	B:00325
C55 INVESTMENT CODE:	13280		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**PROGRAM TYPE**:	Variable Scope
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C6 / Business Operations Support (Level 2) CT / Corporate Infrastructure Sustainment		

CONTACTS			
PREPARED BY:	SAM, Joanne SENIOR PLANNER 50841	**REQUESTOR:**	SMILSKI, Sandra (HRCS Portfolio Manager)
PROJECT MANAGER:	MATIESHIN, Gwenda CORPORATE INFO SYSTEMS DEPT MANAGER 50800		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION
Emerging Information Technology

RECOMMENDATION

Approve between $1.3 million to $8.8 million for the Emerging Information Technology variable scope program with smaller information technology investments typically less than $1 million. The collection of investments will vary from the implementation of new systems to the augmentation of existing systems with increased functionality or development of interfaces between systems. The program is intended to provide the Information Technology Services Division with the agility to implement smaller information technology solutions to address business needs throughout the year while leveraging available staff resources.

SCOPE

Investments include the addition, replacement and upgrades of smaller systems with new functionality, development of interfaces between systems or analytical solutions that leverage enterprise data to support improved decision making or reporting requirements. Systems can be broadly categorized as:

- Engineering (e.g. automate specialized engineering processes, geographic information systems)
- Marketing and Customer Service (e.g. automate pre-authorized payments or requests)
- Financial (e.g. develop financial reports)
- Human Resources and Corporate Services (e.g. implement employee training management system)
- Information Technology Services (e.g. implement software contract management system, upgrade application development platform, implement security access management system)

BACKGROUND

Investments in smaller information technology solutions throughout the year are required to:

- address new or evolving business requirements
- mitigate technology obsolescence of systems
- take advantage of opportunities to leverage technological advances
- address project dependencies.

The Information Technology Division supports over 400 applications in addition to the many interfaces between the various systems.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

JUSTIFICATION

As potential needs are identified in C55, the value is assessed based on typical value measures within the Corporate Value Framework (CVF) that apply to Information Technology investments. Each program item identified can vary significantly and will be justified upon its own merits. Value is typically derived from O&M financial benefits

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

achieved through process efficiencies, improved decision support, and ensuring the reliability and security of our corporation's technology assets by mitigating technology obsolescence risk and cybersecurity risk.

Staff within the Information Technology Services Division and Operating / Corporate Groups work in partnership to develop information technology recommended strategic plans (RSDs) or alternate plans to identify current and future needs. Some needs may result in potential investments in the program and will typically represent the majority of information technology needs. Investments identified within the program represent smaller, less complex and lower risk investments.

Work will be executed based on the prioritization of assessed value, stakeholder priorities, resource availability and annual budget. Investments are approved by the responsible Information Technology Services Manager (or delegate) and the Emerging Information Technology Program Owner (Corporate Information Systems Department Manager).

The minimum and maximum budget ranges have been identified based on historical spend recognizing the size and volume of work may fluctuate annually based on various factors which may include: newly identified needs that reflect stakeholder priorities, project schedule and technology dependencies.

PROGRAM ALTERNATIVES

Alternative Name	Annual Budget	Value	Value/ $K
Maximum	$8,800	N/A	N/A
Minimum	$1,300	N/A	N/A

PROGRAM RISK ANALYSIS

As this is a variable scope program, each program item approval document will outline the risks of proceeding with that specific item. The risks of administering this program are minimal.

IMPACT ON O&A COSTS

Each program item will impact O&A costs differently. Each program item will be individually assessed with details captured within each program item approval document.

This collection of investments may result in an overall increase / decrease of O&A costs associated with:

- software or hardware maintenance
- software licenses
- support costs to maintain solution
- training costs (generally one time)

RELATED INVESTMENTS

Not applicable.

OTHER ALTERNATIVES CONSIDERED

Not applicable.

REFERENCE DOCUMENTS

C55-CIJ-PROG-AD

CAPITAL INVESTMENT JUSTIFICATION ADDENDUM FOR

Emerging Information Technology

Investment Type (Program)

Addendum Number 1

	PREVIOUSLY APPROVED	REVISED	INCREASE/ (DECREASE)
BUDGET RANGE (Annual):	$1,300 to $8,800	$1,300 to $12,500	0 to $3,700
CONTRIBUTIONS RANGE (Annual):	$0 to $0	$0 to $0	$0 to $0
NET BUDGET RANGE(Annual):	$1,300 to $8,800	$1,300 to $12,500	0 to $3,700
		(values listed above are in thousands of dollars)	
CORPORATE VALUE FRAMEWORK SCORE:	**Value:** N/A	**Value:** N/A	
	Value/$K: N/A	**Value/$K:** N/A	
		(CVF scores reflect the Recommended alternative)	

DATE PREPARED: 2020-09-18

EC/MHEB APPROVAL MINUTE & DATE:

APPROVER	APPROVER TITLE	COMMENT	ORGANIZATIONAL UNIT	APPROVAL DATE
Fish, Ian	VP DIGITAL & TRANSFORMATION		VP Digital & Transformation	2020-09-28
Lanyon, Rob	DIRECTOR INFORMATION TECHNOLOGY SERVICES		Director - IT Services Dept	2020-09-28
Matieshin, Gwenda	CORPORATE INFO SYSTEMS DEPT MANAGER		Director - IT Services Dept	2020-09-25
Battistoni, Angelo	CHARTERED PROFESSIONAL ACCOUNTANT		Financial Advisory Services	2020-09-23
Funk, Michelle	BUSINESS SYSTEMS ANALYST		Portfolio Management	2020-09-18

ADDENDUM NUMBER	DATE	REVISION (Summary of change)
1	2020-09-18	Previously approved budget insufficient to fund the introduction of digital technology solutions.

CAPITAL INVESTMENT MASTER DATA			
RESPONSIBLE OPERATING/CORPORATE GROUP:	Digital & Transformation	**REQUESTING OPERATING/CORPORATE GROUP:**	Digital & Transformation
RESPONSIBLE DIVISION:	Information Technology Services	**REQUESTING DIVISION:**	Information Technology Services
RESPONSIBLE DEPARTMENT:	Director Information Technology Services		
I.M. NODE NUMBER:	2.1.15.25.01.1	**W.B.S. NUMBERs:**	B:00325
C55 INVESTMENT CODE:	13280		
SAP PROJECT TYPE:	24 - BOC-VP & Management	**C55 INVESTMENT SUB-CATEGORY**:	
CORPORATE INVESTMENT CATEGORIES:	(Level 1) C6 / Business Operations Support (Level 2) CS / Information Technology		

CONTACTS			
PREPARED BY:	Sam, Joanne SENIOR PLANNER 50841	**REQUESTOR:**	SMILSKI, Sandra (D&TPortfolio Manager)
PROJECT MANAGER:	Matieshin, Gwenda CORPORATE INFO SYSTEMS DEPT MANAGER 50800		

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Emerging Information Technology

RECOMMENDATION
Approve an increase of $3.7 million from a previously approved maximum program budget of $8.8 million to fund the introduction of digital technology solutions.

SCOPE
There will be no change in scope.

BACKGROUND
A recent review of the Corporation's Operating Model has resulted in the creation of a new Digital & Transformation Business Unit that includes the existing Information Technology Services Division and two new divisions Digital and Transformation. The Digital & Transformation Business Unit is responsible for the Corporation's digital strategy and roadmap and for leveraging digital innovation to enable business transformation. This role is focused on stewarding digital innovation across the Corporation. Digital & Transformation staff will collaborate with staff across the Corporation to identify, incubate and generate digital technology ideas. Digital technology solutions will be integrated with the Corporation's existing information technology architecture. Investments in smaller solutions throughout the year are required to: • address new or evolving business requirements (both short term and long term) • mitigate technology obsolescence and/or security risk • continuous innovation / take advantage of opportunities to leverage technological advances • address project and/or other dependencies The Digital & Transformation Business Unit supports over 400 applications in addition to the many interfaces between the various systems.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):
JUSTIFICATION
An increase to the maximum program budget is required to fund the introduction of digital technology solutions that contribute to the Corporation's business transformation objectives which includes improving existing business processes, enhancing / elevating customer experience and improving workforce efficiency. Staff within the Digital & Transformation Business Unit will continue to collaborate with staff across the Corporation to identify potential investments.

JUSTIFICATION – BUSINESS CASE ANALYSIS (SUMMARY):

Each program item identified can vary significantly and will be justified upon its own merits. Value is typically derived from O&M financial benefits achieved through process efficiencies, improved decision support, ensuring the reliability of our Corporation's technology assets by mitigating technology obsolescence risk and cybersecurity risk.

Investment decisions will be guided by the Corporation's digital strategy & roadmap, information technology strategic plans (RSDs) or alternate plans and further informed by taking into consideration several priority pillars (e.g. customers, users, data, innovation and sustainability). Work will be executed based on prioritization of assessed value, stakeholder priorities, resource availability and annual budget. Investments are approved by the responsible Digital & Transformation Business Unit Manager (or delegate) and the Emerging Information Technology Program Owner (Corporate Information Systems Department Manager).

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Emerging Information Technology

PROGRAM ALTERNATIVES

	PREVIOUSLY APPROVED			PROPOSED			INCREASE / (DECREASE)
Alternative Name	Annual Budget	Value	Value/ $K	Annual Budget	Value	Value/ $K	Annual Budget
Minimum	$1,300			$1,300			$0
Maximum	$8,800			$12,500			$3,700

PROGRAM RISK ANALYSIS

As this is a variable scope program, each program item approval document will outline the risks of proceeding with that specific item. The risks of administering this program are minimal.

IMPACT ON O&A COSTS

O&A costs may be impacted as a result of increased investment in this program (e.g. software / hardware maintenance, licenses and/or subscription services).

Each program item will impact O&A costs differently and will be individually assessed with details captured within each program item approval document.

MANITOBA HYDRO
CAPITAL INVESTMENT JUSTIFICATION ADDENDUM
Emerging Information Technology

RELATED INVESTMENTS
Not applicable.

OTHER ALTERNATIVES CONSIDERED
Not applicable.

REFERENCE DOCUMENTS
13280_CIJ_PRG_Emerging Information Technolog.docx