Investment Planning: Procedure for the Set Up and Review of the Asset Management Prioritization Tool	
Description	Provides details on how the asset management prioritization tool is set up and information on the calculations used to determine the investment prioritization.

Overview

Objective

To provide guidance how the asset management prioritization (AMP) tool is set up and explanation on the calculations used to determine the cost benefit points ratio and investment prioritization.

Roles, Responsibility & Authority

Role	Responsibility	Authority
Corporate Asset Management Office (CAMO)	Complete updates and make changes to the AMP templates and procedures as required. Lead a review of strategic priorities every four years, consistent with the multi year budget cycle and Council term.	Responsible for the creation and update of the AMP tool and methodology for determining investment priority.
City Senior Leadership	Participate in the reviews of strategic priorities and weightings.	Approve the assessment criteria and weightings.

Introduction

The purpose of this document is to explain the various parameters and calculations used to assess investments based on the strategy, values and objectives of the City and to provide guidance on how to use this tool to help select a preferred option. The Asset Management Prioritization (AMP) tool was developed in excel and includes several worksheets used to assign weighting and score different benefit categories to determine the cost benefit points ration of investments under consideration. These sheets include:

1. **Template Instructions** – this sheet provides background on the process and step by step instructions on how to use the tool
2. **Benefit Evaluation Sheet** – this sheet is used to record investment information and to assign benefit scores for the investment to determine the priority of investments to be included in the 10-year Capital Investment Plan.
3. **Weighting Scale** – this sheet contains the benefit criteria and their relative weight established by the City to rate investments.
4. **Conversion Tables** – this sheet contains several tables that are used to calibrate the model. Additional information on model calibration is detailed in this procedure.
5. **Dropdowns** – dropdown lists used in the benefit evaluation sheet.
6. **Residual Risk Rating Matrix** – this sheet contains a consequence and likelihood matrix needed to evaluate the residual risks of investments not in included in the Capital Investment Plan.

This methodology is also used within the benefits evaluation portion of the Net Present Value template to assess the benefits during the options analysis stage of the investment planning process.

Model Development Process

The original prioritization tool was created in 2014. In 2019, the Corporate Asset Management Office completed a review and significant update of the model, resulting in the new Asset Management Prioritization tool. The following process, used to create the original model, was also followed in the creation of the revised model. The process guides the development of a multi criteria prioritization model capable of identifying investment priorities amongst a group of valid investments.

1. Identify Strategic Priorities

The first step in the prioritization model development process was to identify the strategic priorities, core values, and objectives that drive investment within the City. These must align with the corporate values of the organization, as detailed in "Our Winnipeg" and other core documents that highlight areas of strategic focus and vision for the future.

First and foremost, assets must meet or exceed the desired levels of service (LOS) to maximize the value derived from owning these assets. This is measured based on whether assets meet new or modified legislative requirements, continuing to maintain assets to ensure consistent LOS and enhancing LOS to deliver services above target levels.

In addition to LOS, several strategic priorities were identified based on input from the executive management team. These include strategic priorities related to environmental sustainability, enabling growth of the City, economic impact of the investment, operational efficiency improvements or revenue generation and the impact to Culture and Heritage.

Strategic priorities are to be reviewed and updated every four years, consistent with the multiyear budget cycle and Council term.

2. Develop Evaluation Criteria

Strategic priorities are combined with service objectives to establish a list of evaluation criteria. Each criterion is weighted to reflect its importance in the planning and decision-making process. Descriptions should be developed to ensure that each criterion is interpreted and applied in a consistent manner. The current prioritization model uses evaluation criteria, which was established and weighted by the City's Corporate Asset Management Advisory Committee, comprised of members from the Executive and Senior Leadership team.

The evaluation criteria are detailed in the **Benefit Evaluation Procedure** which can be found on the Corporate Asset Management intranet page.

3. Develop Rating System

Rating scales must be developed to measure an investments contribution to each benefit criteria. Some criteria may have several potential contributors. A project, for example, can Maintain Quality LOS by contributing to service reliability, functionality, accessibility, etc. In such cases a range of options or definitions may be needed. A five-point rating scale (Very Low to Very High) is sufficient to guide the benefit assessment for each project.

Rationalize Benefit Calculation

Many factors contribute to the benefit realized through completion of a project. The calculation method used in combining these factors plays an important role in how projects are rated and ranked, relative to one another. To be effective, the Benefit Rating calculation must be transparent, follow common logic, and produce results that are consistent, defendable and justified.

Test and refine benefit scoring model

The Benefit Rating is an index of relative benefit and provides a numeric value by which options can be effectively compared and evaluated. While it is abstract and doesn't relate to a tangible outcome, the results produced must be accurate and defendable. As such, testing and calibration play an important role in the model's set-up and implementation. This is performed by applying the model to a range of project Business Cases where benefits are clear and known and confirming that the relative outcomes are defendable and fair. Drivers behind discrepancies and inconsistencies should be investigated and discussed, and appropriate adjustments made to the contributing factors and rating scales. Once finalized, the model's factors and rating scales are endorsed by senior management, published and clearly communicated to investment planning stakeholders throughout the City.

The rating scale is detailed in the **Benefit Evaluation Procedure** which can be found on the Corporate Asset Management intranet page.

4. Create Model

The Benefit Rating Model combines all related factors, rating scales, and calculations into a single tool, which can be consistently applied in evaluating investment opportunities. The current model has been developed in Microsoft Excel to support flexibility, testing and calibration; it is intended that it will migrate to a robust, centrally managed software platform, once it has matured and stabilized.

Benefit Score Calculation

The following equation broadly describes how benefit scores are calculated:

LOS and Strategic Alignment

LOS benefit categories include New Regulation, Maintain Level of Service and Enhance Level of Service. Strategic Alignment benefit categories include: Environmental Sustainability, Enables Growth, Economic Impact, Operational Efficiency/Revenue Generation and Culture/Heritage.

The benefit score for "Maintain LOS" is calculated differently than for other benefit criteria, as Maintain LOS benefit considers risk reduction, while the other benefit criteria assess pure benefits.

To calculate the "Maintain LOS" a consequence category must first be determined (quality, reliability, condition), and then the score attributed to the "from" column is subtracted from the score attributed to the "to" column using the Maintain LOS Benefits conversion table.

An example of the resulting score:

	Maintain LOS					
	Quality		Reliability		Condition	
	From	To	From	To	From	To
Rating	MVH	VLVL	HVH	VLVL	VHVH	VLVL
Score	**1000 – 1 = 999**		**3000 – 1 = 2999**		**10000 – 1 = 9999**	

"From" – Current State
"To" – Future state once investment has been fully implemented

Maintain LOS Benefits			
Score	Maintain LOS		
	Essential	Quality	Image
VLVL	1	1	1
VLL	3	3	3
VLM	10	10	10
VLH	30	30	30
VLVH	100	100	100
LVL	3	3	3
LL	9	9	9
LM	30	30	30
LH	90	90	90
LVH	300	300	300
MVL	10	10	10
ML	30	30	30
MM	100	100	100
MH	300	300	300
MVH	1000	1000	1000
HVL	30	30	30
HL	90	90	90
HM	300	300	300
HH	900	900	900
HVH	3000	3000	3000
VHVL	100	100	100
VHL	300	300	300
VHM	1000	1000	1000
VHH	3000	3000	3000
VHVH	10000	10000	10000

For all other benefits, a score from 1 to 100 is attributed based on the rating received, using the following conversion table:

Other Benefits							
Score	Enhance LOS	New Regulation	Enable Growth	Economy	Environment	Operational Efficiency	Culture/ Heritage
VL	1	1	1	1	1	1	1
L	3	3	3	3	3	3	3
M	10	10	10	10	10	10	10
H	30	30	30	30	30	30	30
VH	100	100	100	100	100	100	100

All benefit scores are subsequently "normalized", meaning that the Maintain LOS benefits and the other benefits are divided by their maximum potential score (10,000 for Maintain LOS and 100 for other benefits) to ensure that all the benefits are rated on the same scale from 0 to 1. This score is then multiplied by a factor (currently at 10,000), calculated in such a way that the total maximum potential score that a project could get is 10,000 if it had the maximum service usage, was in the highest importance category, and received maximum benefit points in each of the benefit categories. This factor can be found and modified in the *Weighting Scale* worksheet. All conversion tables are available under the Conversion Tables sheet in the workbook.

The benefit score for each of the benefit criteria is then multiplied by their relative weight as attributed by the CAO and executive management according to the Benefit Criteria Weighting table. These weightings were developed using a pairwise comparison technique and should only be updated in alignment with the multi-year budget process or Council term.

Benefit Criteria Weightings	
New Regulation	31%
Maintain LOS	31%
Enhance Level of Service	7%
Growth	7%
Economy	7%
Environmental	7%
Operational Efficiency	7%
Culture/Heritage	3%

Descriptions of each of the benefit criteria can be found in the Level of Service and Strategic Alignment section of the **Benefit Evaluation Procedure**.

Service Usage

Service usage assesses how often a service is used and acts as a multiplier to the benefit score based on the person hours/year of usage. This is normalized across services by dividing by a service usage maximum. The service usage maximum was established in 2019 and is based on the maximum calculated user hours for water consumption, the mostly highly utilized City service. This maximum will be reviewed on an annual basis and updated every 4 years, consistent with the multiyear budget cycle.

Service Usage Maximum		
Year	**MAX USAGE**	**Department**
2019	158,475,797	Water & Waste

Service Importance

Service importance is meant to distinguish between important services and those core services most critical to ensuring fundamental needs of residents are being met. Although all services are important, the degree of importance varies between vital and desired services.

Six service groupings were developed to help categorize and amalgamate the over 100 sub-services that make up the City's service-based budget. Each category was assigned a unique multiplying factor in line with the degree of importance.

Multiple sources of information were cross-referenced when establishing the degree and scale of importance for each grouping. Sensitivity analysis was completed with departments using actual investment needs and project information to validate the scale. This led to an exponential distribution as outlined in the following table.

Service Grouping	Services	Scale
1	Water Wastewater	1000
2	Disaster Preparedness & Response Fire Service Medical Response Police Service/Crime Prevention	903
3	Bridges – Regional Land Drainage & Flood Control Public Transit Roads – Regional Solid Waste	664
4	Active Transportation Bridges – Local City Planning Community Liveability Contact Centre – 311 Development, Approval, Permits & Inspections Parks – Regional Road – Local Urban Forests	441
5	Animal Services City Beautification Economic Development Support Insect Control Library Neighborhood Revitalization Parking Parks – Local Recreation Recycling	143
6	Arts, Entertainment & Culture Support Cemeteries Golf Services Heritage Conservation	10

Those services which can be characterized by a high degree of public necessity, health and safety, and are essential to the sustainability of life are considered vital. As fundamental service needs are met, there is desire for services that focus on building communities, fostering family relationships, providing access to leisure, and promoting entertainment and culture. Additional nformation on Service Importance can be found in the **Benefit Evaluation Procedure**.

Service Impact

The more an infrastructure investment has a direct impact to the Level of Service and residents, the greater the priority is placed on the investment. Service impact determined based on three categories: direct, indirect and supplemental. The benefits score for an investment is adjusted depending on the impact to the service. Direct receives the full benefit score, indirect receives 50% of the benefit score, and supplemental investments receive 10%. Definitions for each of the service impact categories can be found in the **Benefit Evaluation Procedure.**

Total Benefit Points

Once the project benefits have been determined, projects are ranked according to their cost benefit points ratio. This is illustrated in the following excerpt from the table used to create the 2020 Infrastructure Plan:

General				Class	Cost		Level of Service - Benefit Analysis						Strategic Alignment - Benefit Analysis					Rank	
Project Name	Service Impact of Project	Service	User-hrs (per year)		Capex ($k)	Year Authorization Req'd for Detailed Design & Construction	New Regulation	Maintain LOS			Enhance LOS		Environment	Enables Growth	Economy	Operational Efficiency	Culture/ Heritage	Cost/ Benefit	Cost/ Benefit Rank
								Category	From	To	Category	Score							
NEWPCC Upgrade Phase 2: Biosolids	Direct	Wastewater	158,475,797	3	553,000	2021	VH	Quality	VHVH	VLVL			M	VH	VH			0.07210	1
Insect Control Buildings and Yards Replacement	Direct	Insect Control	137,790,000	3	28,700	2020		Quality	VHVH	VLVL			L		L	L		0.07299	2
Water Meter Renewals	Indirect	Water	158,475,797	5	150,355	2025		Reliability	VHVH	LVL	Quality	M	L			VH		0.077	3
NEWPCC Upgrade Phase 3: Nutrient Removal Facilities	Direct	Wastewater	129,645,880	3	828,000	2023	VH	Quality	HH	VLVL			M		VH			0.24	4
Bus Radio Replacement	Direct	Public Transit	36,073,835	5	20,000	2021		Reliability	HH	VLVL								0.475	5
Brady Road Resource Management Facility - Onsite Leachate Management	Supplemental/Support	Solid Waste	139,722,000	5	8,200	2023					Quality	M	VL		VL	H		0.476	6
North Transit Garage Replacement	Direct	Public Transit	9,018,459	5	205,000	2020	VH	Condition	VHVH	VLVL			H		H	M		0.811	7
CIWMS - Source Separated Organics - Composting Facility & Carts	Direct	Recycling	139,722,000	5	101,000	2024					Quality	H	H		M			1.63	8
Southwest Interceptor River Crossing	Direct	Wastewater	4,346,907	5	88,000	2023		Reliability	HVH	VLVL			L	VH	M	VL		1.86	9
Airport Area West Water & Sewer Servicing	Direct	Water	3,673,447	5	70,000	2021					Quality	VH		VH	M			2.05	10

Once all relevant investment information has been entered in the table and scores assessed for each of the benefit criteria, a cost benefit score and cost benefit rank are determined. This information is used to create the City's Infrastructure Plan which outlines the City's 10-year investment strategy, outlining capital priorities to support the development of a multi-year capital budget.

Sample Calculation

The following table provides and example of a scored project and the resulting benefit score, cost benefit score and benefit rank:

General	Project #	PW - 005
	Project Name	New Bridge
	Department	Public Works
	Service	Bridges - Regional
	Project Owner	Jane Doe
	Investment Type	Project
	Capex ($k)	$500,000
	Grants and other external funding ($k)	$75,000

			Score
Multipliers	Service Importance	3	664
	Service Usage	10,000,000	0.0631
	Service Impact	Direct	1

					Score	Category Weighting	Usage	Importance	Weighted Score (Score x Category Weighting x Usage x Importance)
Benefits	LOS	**New Regulation**		VL	100	31%	0.0631	664	1298.873
		Maintain LOS	Quality From	VLVL	10000-1 = 9999.0	31%	0.0631	664	129874.353
			Quality To	VHVH					
			Reliability From						
			Reliability To						
			Condition From						
			Condition To						
		Enhance LOS	Quality	M	1000	7%	0.0631	664	2932.94
			Reliability						
	Strategic Alignment	Environmental Sustainability		M	1000	7%	0.0631	664	2932.94
		Enables Growth		VH	10000	7%	0.0631	664	29329.4
		Economic Impact		VH	1000	7%	0.0631	664	29329.4
		Operational Efficiency/Revenue Generation		VL	300	7%	0.0631	664	879.882
		Culture/Heritage		Yes	10000	3%	0.0631	664	12569.743
TOTAL SCORE									209147.531
BENEFIT SCORE (Impact)					1				**209,148**
COST BENEFIT SCORE (Total Cost - Grants & Funding)/Total Benefits Score									**2.0321**

Interpretation and Limitations of the AMP

The cost-benefit points ratio as calculated in the model compares dollars (cost) to points (benefits) rather than the traditional approach of comparing the costs of the investment to savings. This is largely because many of the potential benefits are intangible and cannot be directly monetized. As such, the cost-benefit ratio of an investment by itself is of little significance. However, it does provide valuable information in comparison to other investments by providing a priority ranking of the investment and allows the City to distinguish between high value projects (low cost-high benefits), lower value projects (low cost low benefit, high cost high benefit) and poor value projects (high cost low benefit).

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References & Resources

Title	Description	Document Location
Asset Management Prioritization Tool	Tool used to assess the cost and benefits of projects; creates a priority list of projects to be used to create the department's capital budget submission.	https://winnipeg.ca/infrastructure/asset-management-program/templates-manuals.stm#4
Benefit Evaluation Procedure	Provides instructions on how to assess investment benefits in order to compare investment options and prioritize investments.	https://winnipeg.ca/infrastructure/asset-management-program/templates-manuals.stm#4