OSHAWA POWER

ACUMEN

Project Prioritization using a Strategic Asset Management Plan (SAMP)

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Agenda

01. Why use a SAMP Framework?

02. What are some key features of SAMP?

03. How can LDCs leverage SAMP to prioritize projects?

Oshawa Power – An Overview

62,500+ Customers
92% Residential

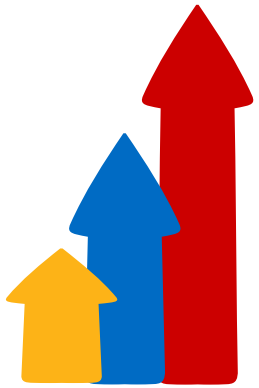
9 Substations (44 /13.8 KV)
3 HONI TS (230 /44 KV)

145 km²
Service Area
62% Urban ; 38% Rural

1000 km
Primary Circuit
54% O/H ; 46% U/G

220 MW Peak Demand
1,050 GWh/yr.
50% Split

Oshawa Power's Drivers



- Serving one of the Fastest growing communities in Canada
- Staying ahead of Electrification & Energy Transition Challenges
- New Leadership Team with renewed focus on innovation while maintaining cost effectiveness and customer satisfaction
- Cost of Service Application in 2025

ion, Mission & Values

Vision Statement

Be a trusted and leading energy partner today and tomorrow.

Mission Statement

Empowering customers to thrive through the evolving energy transition with innovative products, services and solutions.

Values

- Safety
- Stewardship
- Innovation
- Care for our People
- Courage to Act
- Customer Focus

Our Pillars

We align and focus our work through our People, Products, Process, and Performance

Utilities and Energy Transition

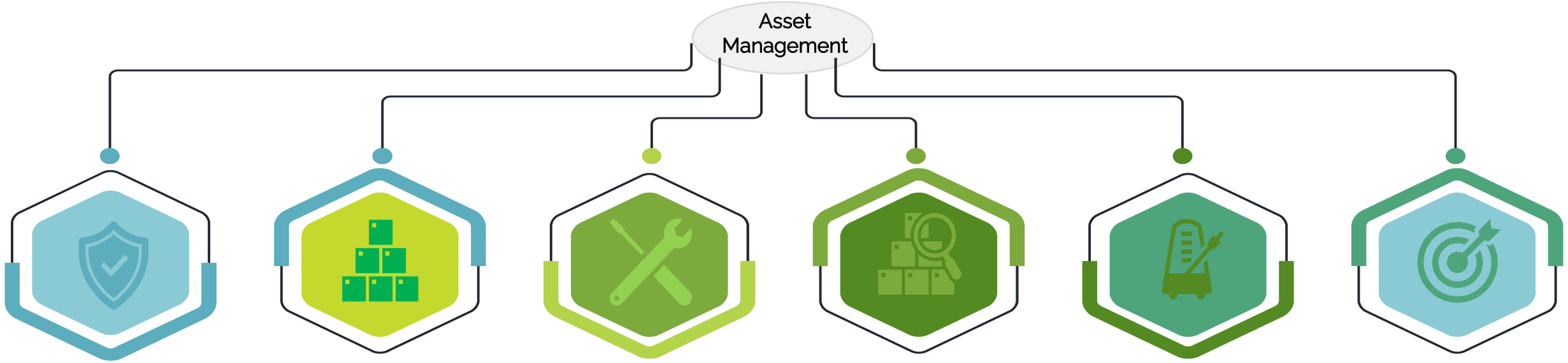
Challenges and Opportunities underscore the need for a strategic approach in managing assets:

Ageing Infrastructure

Evolving Regulatory Landscape

Growing Demand for Sustainability

Asset Management – A Story Retold



Safety & Reliability forms the foundation for the safe & reliable operation of the distribution grid

Resource Optimization ensuring optimal allocation and utilization of both human and financial resources

Operations & Planning balancing immediate operational needs vs. planning for long-term business sustainability

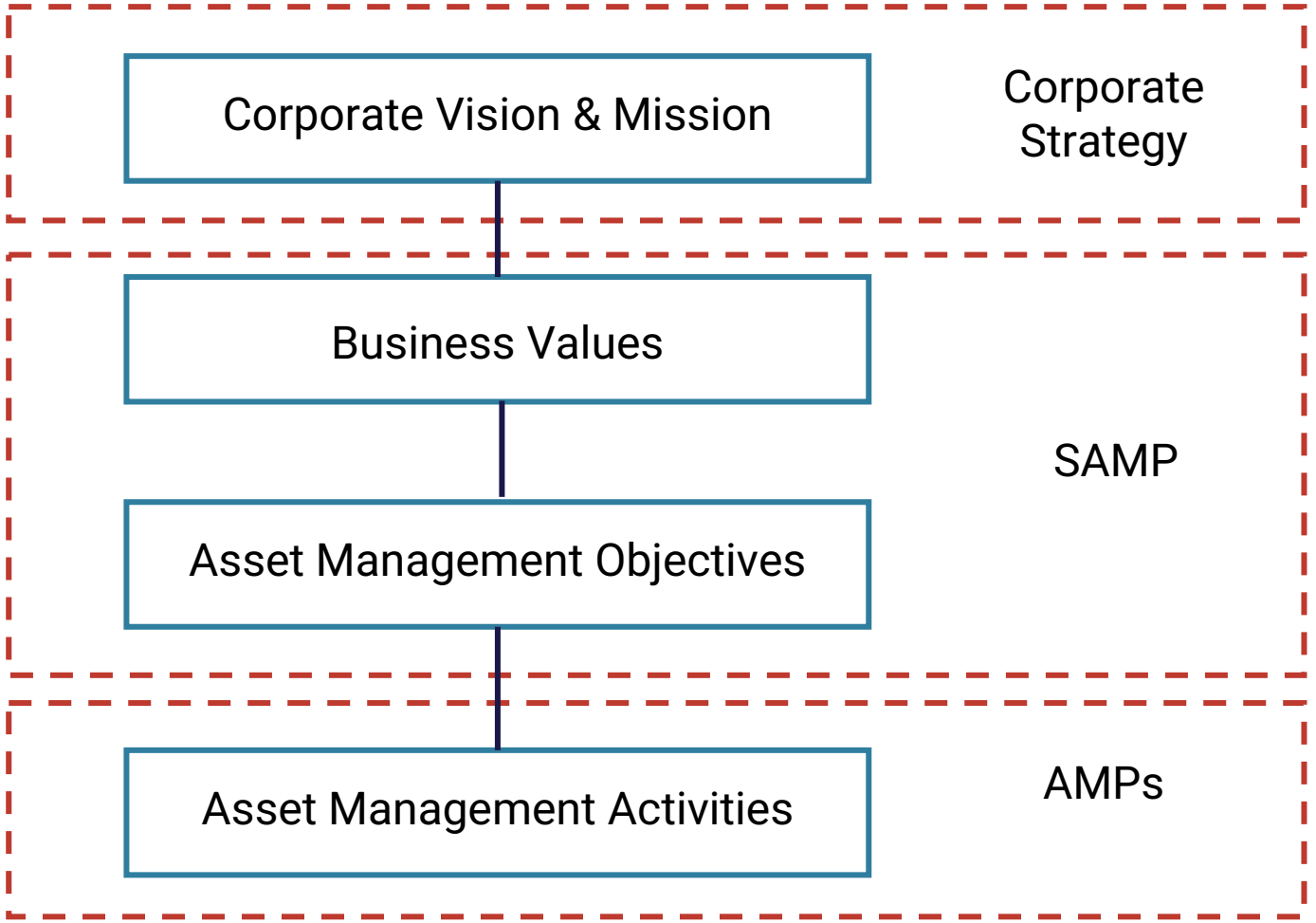
Maximize ROI ensuring all maintenance activities contribute to utility's success

Beyond Maintenance should go beyond physical maintenance of equipment to encompass a strategic approach to asset lifecycle planning

Strategic Goals tie asset management with strategic decision-making to align maintenance activities with organizational goals and objectives

SAMP – An introduction

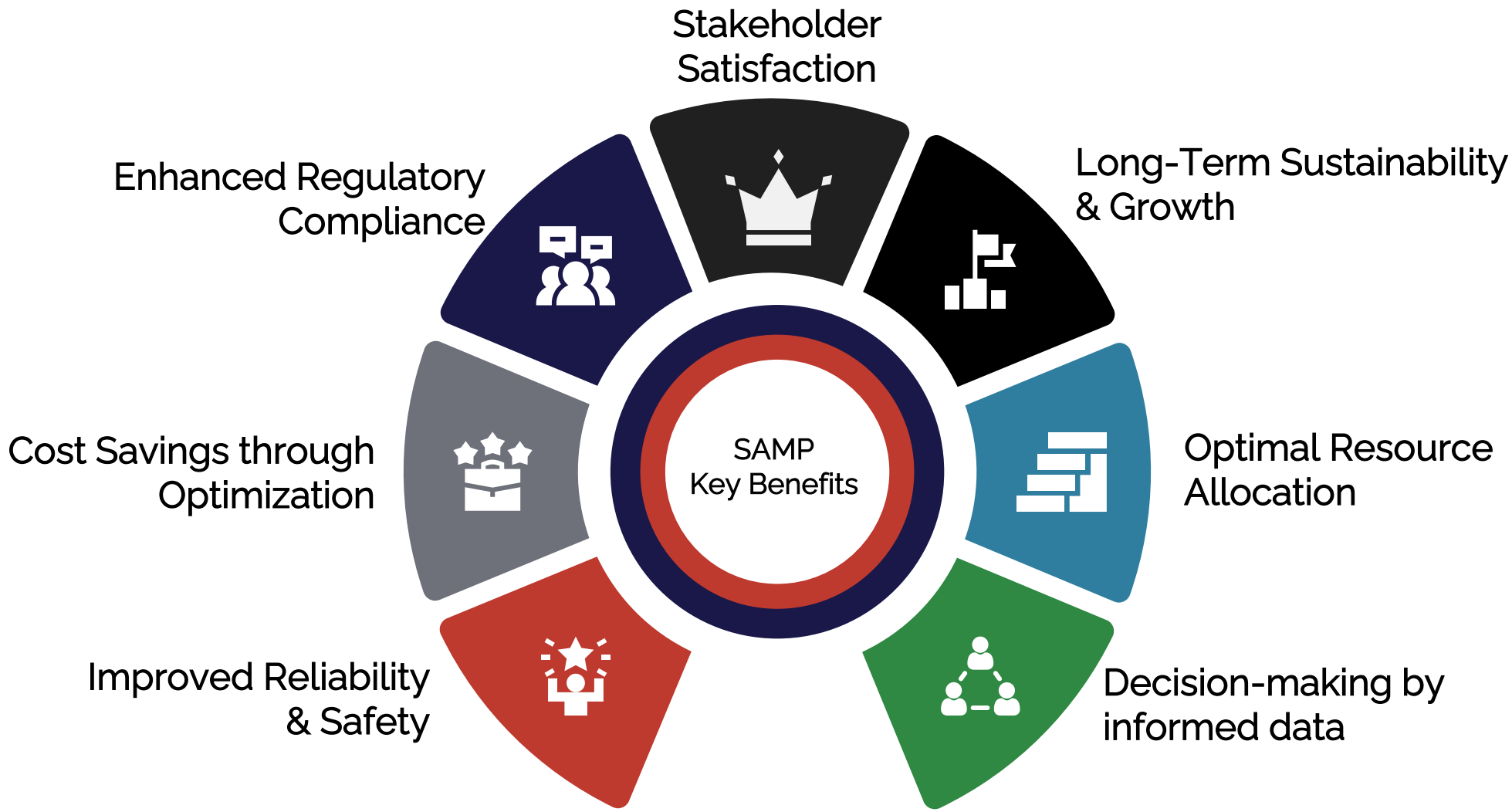
Comprehensive Framework that guides the **strategic** management of the complete **asset portfolio** to best meet **organizational objectives**



AMP vs. SAMP

	AMP	SAMP
Scope	Specific document on type or group of assets	Higher-level document on broader range of assets and how they align with overall goals and objectives.
Level of Detail	Granular document detailing maintenance schedules, condition assessment criteria and procedures for managing the asset	Less detailed in terms of day-to-day operations and maintenance procedures
Time Horizon	Shorter time horizon (1 to 5 years) Detail day-to-day and short-term asset management activities	Forward-looking & longer time horizon (5+ years). Provide a roadmap for achieving the organization's long-term objectives through effective asset management.
Focused on	Operational aspects of asset management	Strategic aspects of asset management

SAMP – Key Benefits



Components of a SAMP

Lifecycle Management

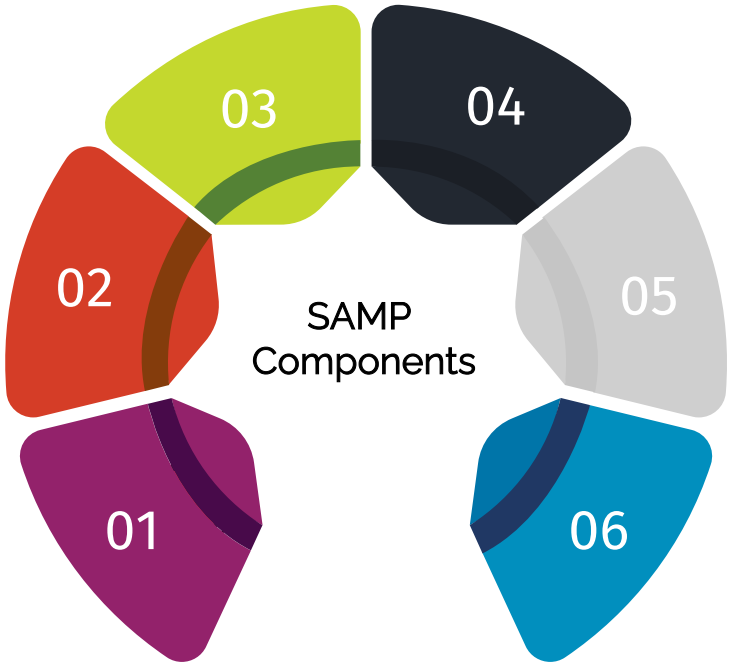
- Overview of the asset lifecycle from acquisition to disposal.
- Importance of optimizing the entire lifecycle to enhance efficiency and reduce costs

Risk Management

- Understanding and categorizing risks related to asset performance.
- Strategies for mitigating risks, including predictive maintenance and contingency planning.

Asset Inventory and Condition Assessment

- Importance of maintaining an accurate inventory of assets.
- The role of condition assessments in identifying potential risks and performance gaps.



Performance Monitoring and Key Performance Indicators (KPIs):

- Introduction to relevant KPIs for electrical distribution utilities.
- How real-time monitoring and analysis can improve decision-making.

Investment Planning

- Balancing short-term needs with long-term goals in infrastructure investments.
- Techniques for prioritizing investments based on criticality and strategic objectives.

Regulatory Compliance

- Ensuring compliance with industry regulations and standards.
- How a SAMP can facilitate adherence to regulatory requirements.

Implementing SAMP

Assess Current Practices:

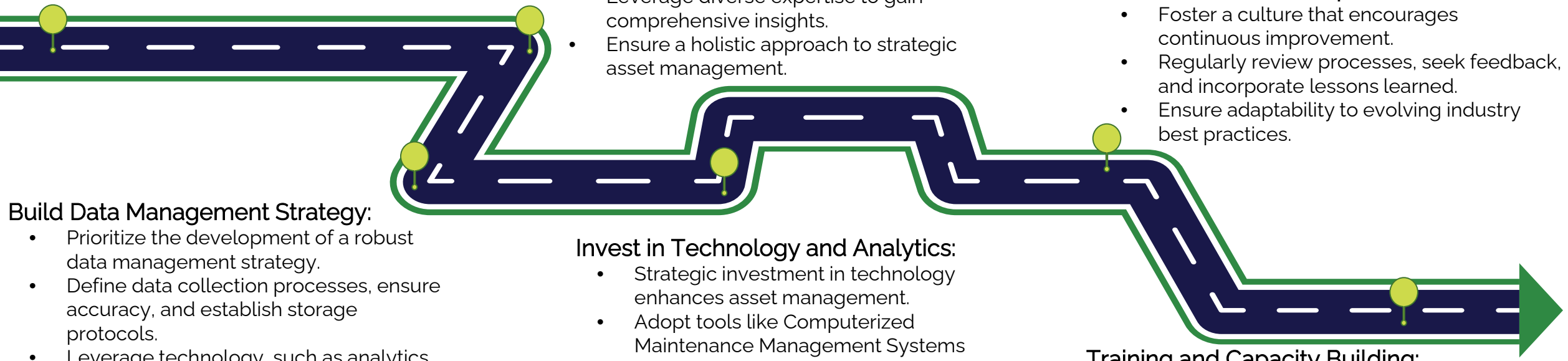
- Start with understanding your current asset management practices.
- Evaluate existing strengths, weaknesses, opportunities, and threats.
- Lay the foundation for targeted improvements.

Create a Cross Functional Team:

- Start with understanding your current asset Form a cross-functional team with representatives from various departments.
- Leverage diverse expertise to gain comprehensive insights.
- Ensure a holistic approach to strategic asset management.

Build a Continuous Improvement Culture:

- Foster a culture that encourages continuous improvement.
- Regularly review processes, seek feedback, and incorporate lessons learned.
- Ensure adaptability to evolving industry best practices.



Build Data Management Strategy:

- Prioritize the development of a robust data management strategy.
- Define data collection processes, ensure accuracy, and establish storage protocols.
- Leverage technology, such as analytics tools, for informed decision-making..

Invest in Technology and Analytics:

- Strategic investment in technology enhances asset management.
- Adopt tools like Computerized Maintenance Management Systems (CMMS) and predictive analytics.
- Leverage technology for real-time monitoring and proactive issue resolution.

Training and Capacity Building:

- Invest in training programs for staff at all levels.
- Keep employees informed about new technologies and industry best practices.
- Ensure that the workforce is well-equipped to implement and sustain the SAMP.

Potential Use Cases

Potential Use Case	Challenge	SAMP Implementation
Reliability Enhancement	Outages and disruptions due to aging infrastructure	SAMP focused on asset condition assessments and predictive maintenance strategies
Regulatory Compliance	Unable to keep up with regulatory requirements, risking non-compliance	SAMP emphasizing real-time monitoring and regular compliance audits.
Asset Lifecycle Optimization	Diverse assets – inability to effectively manage lifecycle, leading to premature failures	SAMP with a focus on lifecycle management, incorporating predictive analytics for asset replacement.
Investment Planning	Difficulties in prioritizing investments and balancing short-term needs with long-term goals.	SAMP emphasizing criticality analysis and a risk-based approach to investment planning.
Technology Integration	Need to leverage advanced technologies for better asset management but lack of a cohesive strategy.	SAMP integrating utilization of innovative technologies for asset management and system improvement.

Project Prioritization using SAMP

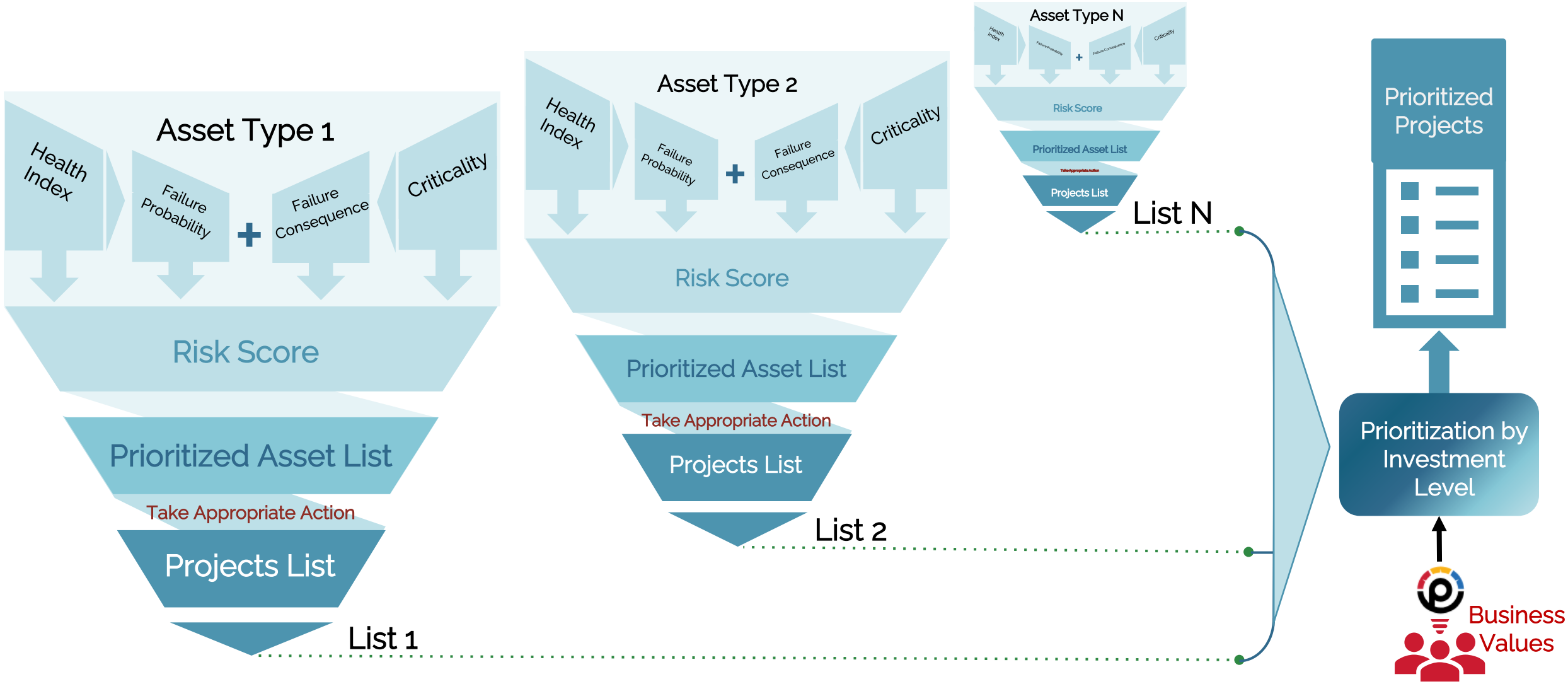
Project Prioritization - aligning projects with strategic goals, optimizing resource allocation, and ensuring cost-effectiveness

Strategic Alignment – Utilizing Business Values

Cost-Benefit Analysis – defining Business Value weightage & Impact Indicators

Risk-Based Approach – creating risk matrix and maximizing value by minimizing risk

Project Selection



Proactive Vs Reactive Replacements

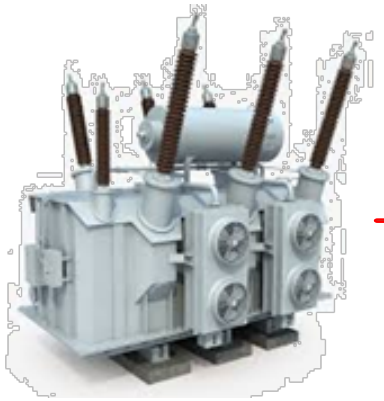
Proactive Replacements

- Replace before fail
- Significant failure consequence
- High replacement cost
- Economic EOL considered
- Defer or advance replacements to smooth out cost requirements

Reactive Replacements

- Run to failure
- Small failure consequence
- Low replacement cost
- Economic EOL not considered
- Advance replacements to smooth out cost requirements

Selecting Appropriate Action



Flag for Action

Financially Driven Asset Management Decisions
(RTF; Replace; Repair…)

SPECIALIZED ELECTRICAL TESTING

- Partial Discharge Measurement
- PD Localization
- Sweep Frequency Response
- Advanced Power Factor
- Freq. Response Stray Losses
- Dielectric Spectroscopy
- Degree of Polymerization
- Dynamic Resistance
- …

Risk Based Investments Prioritization

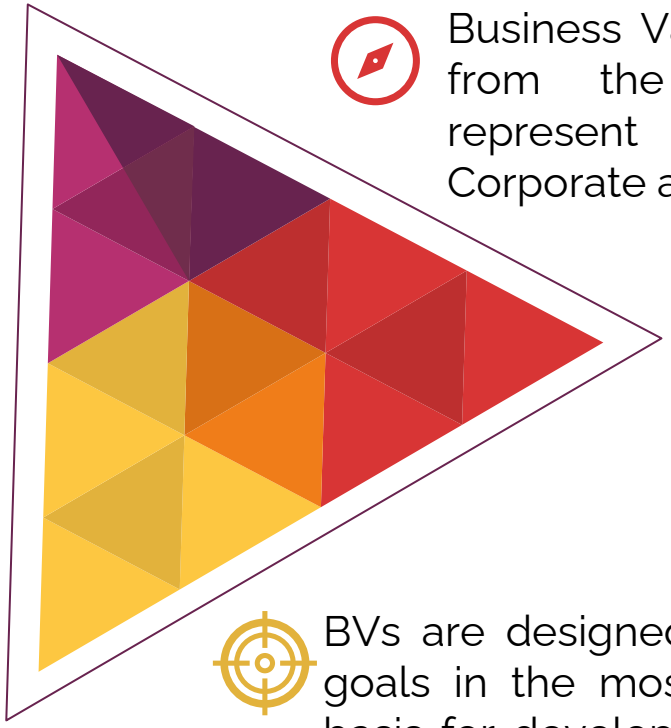
Investments Prioritization Process provides means of comparing and ranking investments in different business areas as well as within same business areas

Investments are **ranked** based on the ratios of risk they alleviate to their cost

The **goal of the Investment Prioritization Process** is to optimize overall risk to investment ratio

Defining Business Values, Business Values Measures and Weights

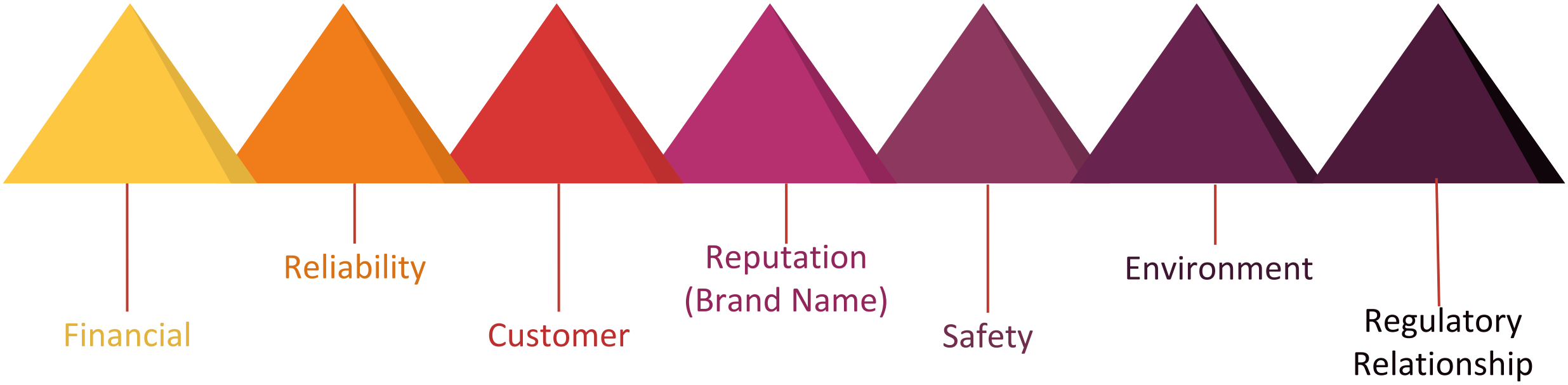
Most Corporations are expected to have Mission & Vision Statements that describe, at the high level, their aspirations and drive their goals and objectives.



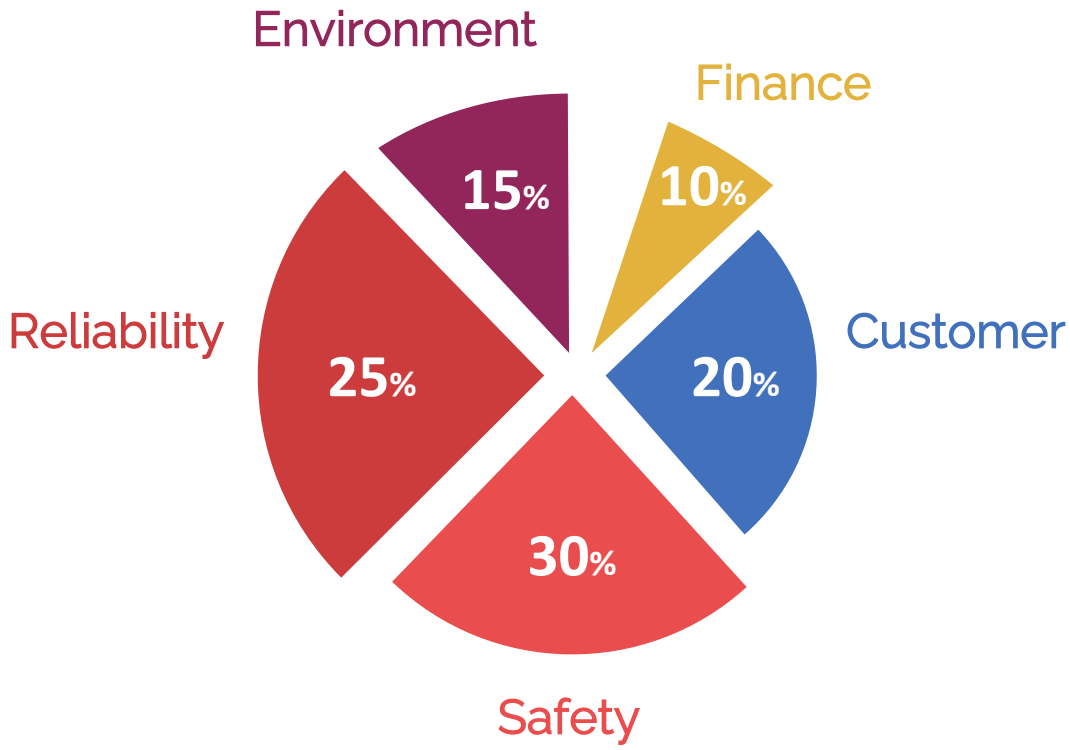
Business Values (BVs) are then developed from the Corporate objectives and represent a set of values that guide Corporate actions and behavior.

BVs are designed to help achieve company's strategic goals in the most cost-efficient manner and form the basis for developing portfolio of investments, managing risks and facilitating investments trade-offs

Typical BVs


Financial
Reliability
Customer
Reputation
(Brand Name)
Safety
Environment
Regulatory
Relationship

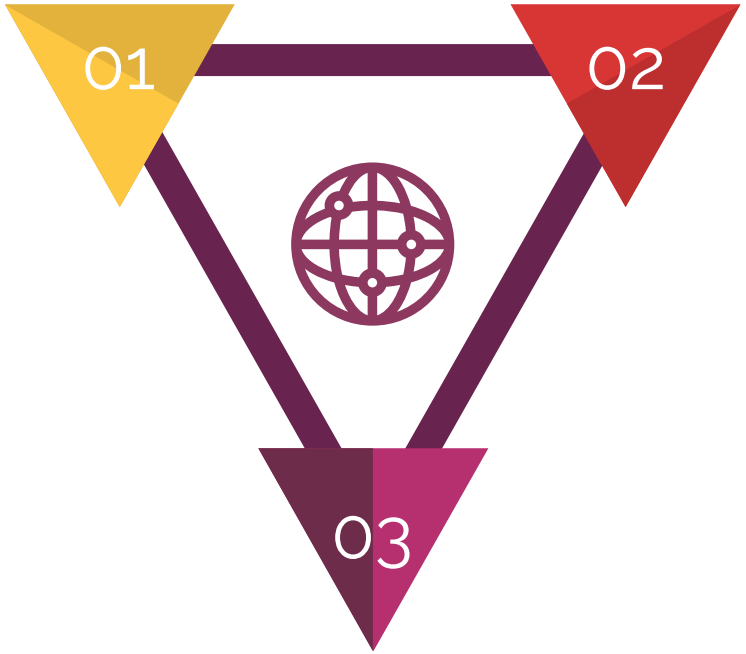
Example of Business Values' Weights



Basis of Prioritization

Business Values (BVs):

Define Risk Areas



Business Value Measures (BVMs)

Provide means of assessing BVs

Impact Indicators (IIs)

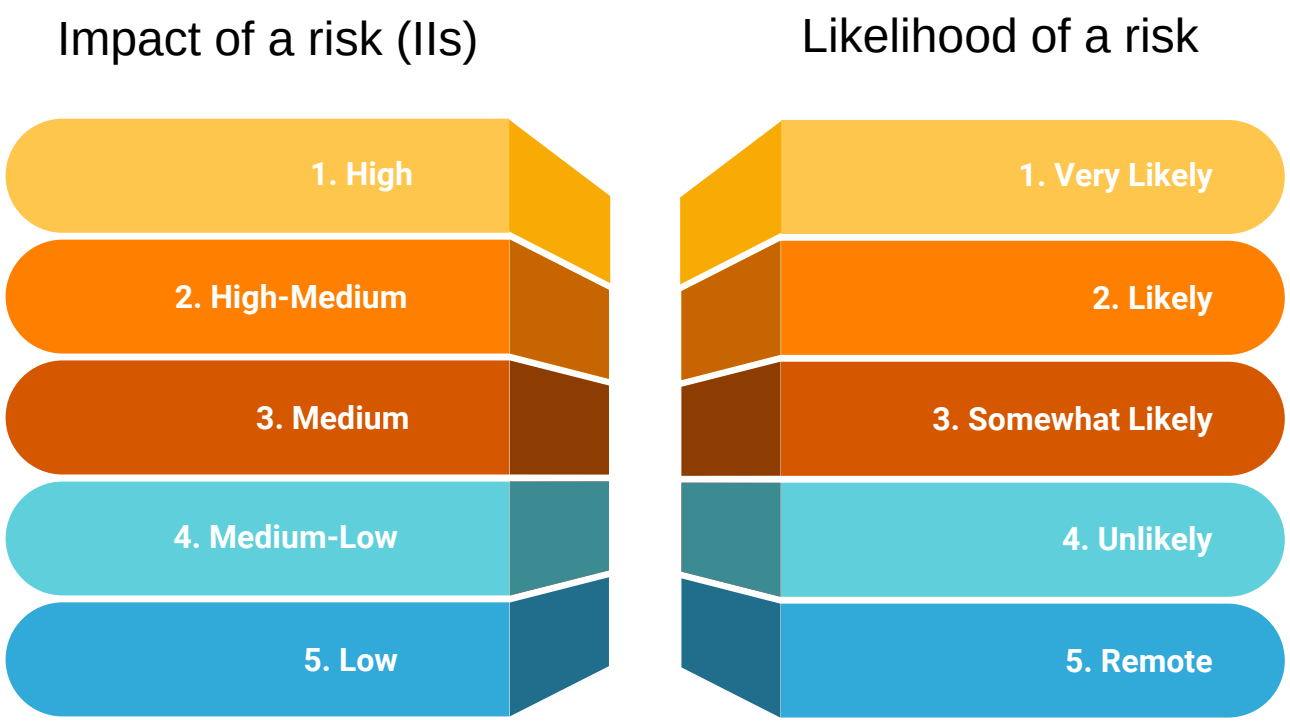
are criteria for measuring consequences to BVMs. For each BVM, there are typically 5 levels of IIs

Impact Indicators Matrix – an example

Risk Categories		Description	Weight	High	H-M	Medium	M-L	Low
1	Safety	customer and employee safety	30%	fatality/serious injury		loss time injury, hospitalization for public		minor injury, no loss time
2	Reliability	reliable supply of electricity delivered (customers impacted)	25%	express feeders	stations	3-phase primary feeders	- 1 ph primary feeders - distribution transformer	secondaries
3	Customer	customer expectation; customer complaints; key customer impact; OEB complaints	20%	significant increase in complaints; significant worsening of overall customer satisfaction		increase in complaints; worsening of overall customer satisfaction		no change
4	Finance	impact on cash flow; impact on shareholder return; long-term future cost exposure	15%	significant reduction in shareholder return; significant financial liability; significant future cost avoidance		moderate reduction in shareholder return; financial liability; future cost avoidance		minimal reduction in shareholder return; minimal financial liability; minimal future cost avoidance
5	Environment	oil leaks; pole treatment; PCB	10%	oil spill from power transformer near water; PCB>2 ppm at locations with public exposure (defined as such)		oil spill from power transformers; PCB>2 ppm		minimal oil spill from distribution transformers

BV Risk Assessment

Risk to each BV depends on two factors:



Risk Matrix

A **Risk Matrix** combines **impact** and **likelihood** of risk to estimate the risk to a Business Value

Likelihood / Consequence	Low	Medium-Low	Medium	High-Medium	High
Very Likely (>95%)	9	24	67	181	491
Likely (65 to 95%)	7	19	52	141	382
Somewhat Likely (25 to 65%)	5	14	37	100	273
Unlikely (5 to 25%)	2	5	15	40	109
Remote (<5%)	1	3	7	20	55

BV impact + BV likelihood = BV Risk Score

Total Risk Score (TRS) = ΣR_i x WBV_i

Where, R_i = Bv_i Risk Score
WBV_i = Bv_i Weightage

Prioritizing Projects Steps - Proactive Replacements, New Assets

Steps:

1. Calculate TRS **before** a project is implemented
2. Calculate TRS **after** the project is completed
3. Calculate project **Cost to Risk Reduction Factor (CRRF)** as follows:

$$CRRF = \text{Project Cost} / \Delta TRS$$

4. The projects are then prioritized by CRRFs, from the lowest to the highest: the lower the cost per unit of risk reduction, the more RISK effective the project is

Project Prioritization Tool

Invetment Category	System Renewal
Grouping	Overhead Asset Renewal
Subcategory	Switch Replacement
Project Number	Project 1
Project Name	OH Switch Renewal 1
Description	XYZ Road
Cost	$50,000.00

BV		**Before**				**After**			
		Likelihood	**Consequence**	**Risk Value**	**Risk Score**	**Likelihood**	**Consequence**	**Risk Value**	**Risk Score**
Safety	**30%**	Very Likely (>95%)	Medium	67	19.95	Remote (<5%)	Low	1	0.30
Reliability	**25%**	Very Likely (>95%)	Medium-Low	24	6.12	Remote (<5%)	Low	1	0.25
Customer	**20%**	Unlikely (5 to 25%)	Medium-Low	5	1.09	Remote (<5%)	Low	1	0.20
Efficiency / Financials	**15%**	Remote (<5%)	Medium	7	1.11	Remote (<5%)	Low	1	0.15
Environment	**10%**			0	0.00			0	0.00
Total Risk Score (TRS)					**28.26**				**0.90**
Δ TRS		**27.36**							
CRRF ($/ Δ TRS)		**1,827**							

Defined by SAMP through strategic goals & objectives:

- Business Value (BV)
- BV Weightage

User Defined by Impact Indicators & Experience:

- Likelihood
- Consequence

Calculated by tool:

- Risk Value (RV) – risk table below
- Risk Score – RV x BV Weightage

Likelihood / Consequence	**Low**	**Medium-Low**	**Medium**	**High-Medium**	**High**
Very Likely (>95%)	9	24	67	181	491
Likely (65 to 95%)	7	19	52	141	382
Somewhat Likely (25 to 65%)	5	14	37	100	273
Unlikely (5 to 25%)	2	5	15	40	109
Remote (<5%)	1	3	7	20	55

Program Prioritization Tool

Program Name	Vegetation Management									
Description	XYZ Road									
Optimum Increment	Increment 1									
Increment Name	Description	Cost	Incremental Cost	CRRF ($/ D TRS)	Risk					
					BV	Safety	Reliability	Customer	Efficiency / Financials	Environment
						30%	25%	20%	15%	10%
Minimum	7 year cycle	$50,000	n/a	n/a	Likelihood	Unlikely (5 to 25%)	Somewhat Likely (25 to 65%)			
					Consequence	High-Medium	High-Medium			
					Risk Value	40	100	0	0	0
					Risk Score	12.05	25.11	0.00	0.00	0.00
					Total Risk Score (TRS)	37.16				
Increment 1	6 year cycle	$70,000	$20,000	948	Likelihood	Remote (<5%)	Unlikely (5 to 25%)			
					Consequence	High-Medium	High-Medium			
					Risk Value	20	40	0	0	0
					Risk Score	6.03	10.04	0.00	0.00	0.00
					Total Risk Score (TRS)	16.07				
					Δ TRS	21.09				
Increment 2	5 year cycle	$80,000	$30,000	1,003	Likelihood	Remote (<5%)	Remote (<5%)			
					Consequence	Medium	High-Medium			
					Risk Value	7	20	0	0	0
					Risk Score	2.22	5.02	0.00	0.00	0.00
					Total Risk Score (TRS)	7.24				
					Δ TRS	29.92				

Defined by SAMP through strategic goals & objectives:

- Business Value (BV)
- BV Weightage

User Defined by Impact Indicators & Experience:

- Likelihood
- Consequence

Calculated by tool:

- Risk Value (RV) – risk table below
- Risk Score – RV x BV Weightage

Likelihood / Consequence	Low	Medium-Low	Medium	High-Medium	High
Very Likely (>95%)	9	24	67	181	491
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Remote (<5%)	1	3	7	20	55

Prioritized Lists

Project Priority	Investment Category	Grouping	Subcategory	Project Number	Project Name	Description	Cost	CRRF
1	System Renewal	Overhead Asset Renewal	Insulator Replacement	Project 4	ABC	Insulator Replacement	$100,000	1,292
2	System Renewal	Underground Asset Renewal	Cable Remediation –Replacement	Project 2	U/G primary replacement	Feeder Replacement F1 to F3	$80,000	1,592
3	System Renewal	Overhead Asset Renewal	Switch Replacement	Project 1	OH Switch Renewal 1	XYZ Road	$50,000	1,827
4	System Renewal	Transformer Renewal	Transformer Replacements	Project 3	TX Replacement	TX 123 - 129	$80,000	4,668
5								

Project Priority	Program			Optimum Increment				CRRF
	Program Number	Program Name	Description	Increment	Description	Cost	Incremental Cost	
1	Program2	Pole Testing	Annual Power Testing Program	Increment 2	All poles over 15 years	$120,000	$50,000	914
2	Program1	Vegetation Management	XYZ Road	Increment 1	6 year cycle	$70,000	$20,000	948
3								

Bonus Slide: Incorporating Risk Based Prioritization Methodology into DSP

1. Present the List of BVs consistent with Mission, Vision and Objectives
2. Describe Risk Based Prioritization Methodology, including BVMs and Weights for each BV, Impact Indicators Matrix, and Risk Matrix
3. Provide Prioritized List of Projects/Programs
4. Include Qualification that only Non-Mandatory Projects and Program Investments above Min Level are Prioritized

Thank You

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