Sustainable Asset Management: An Integrated Institutional Approach

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Agenda

FORMALIZING AND IMPLEMENTING ASSET MANAGEMENT

MISSION ZERO AND SUSTAINABILITY

AN INTEGRATED APPROACH

NEXT STEPS

The Institute of Asset Management

Sheridan

About Sheridan

FACULTIES

- Animation, Arts & Design
- Applied Health and Community Studies
- Applied Science and Technology
- Humanities and Social Sciences
- Pilon School of Business

CONTINUING AND PROFESSIONAL STUDIES

500+
programs and courses offered

120+
programs across 5 Faculties

28
degree programs

80+
programs with work-integrated learning (WIL)* opportunities

Serving over 23,000 learners and 3,000 employees across three campuses in Ontario, Canada – Brampton, Mississauga and Oakville

Davis Campus (Brampton) ›

Located in Brampton, Davis is our largest campus. An exciting, multicultural hub, it houses our applied health, community services, engineering and technology programs.

Hazel McCallion Campus (Mississauga) ›

Our Hazel McCallion Campus (HMC) is home to the Pilon School of Business. Built to LEED gold standards, this campus is tucked right in the heart of Mississauga, Ontario — Canada's sixth-largest city.

Trafalgar Road Campus (Oakville) ›

Located in the lakeside town of Oakville, Trafalgar Campus is home to our Faculty of Animation, Arts and Design, as well as a number of programs in science and technology and health and community studies.

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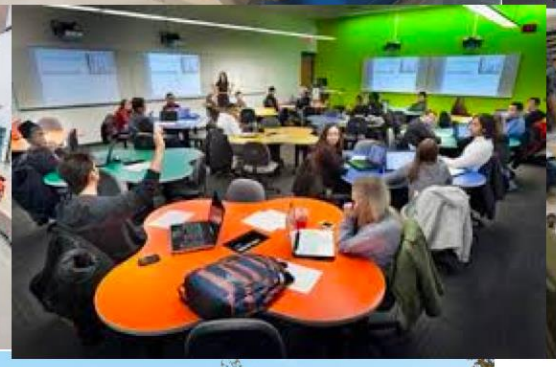
Assets at Sheridan



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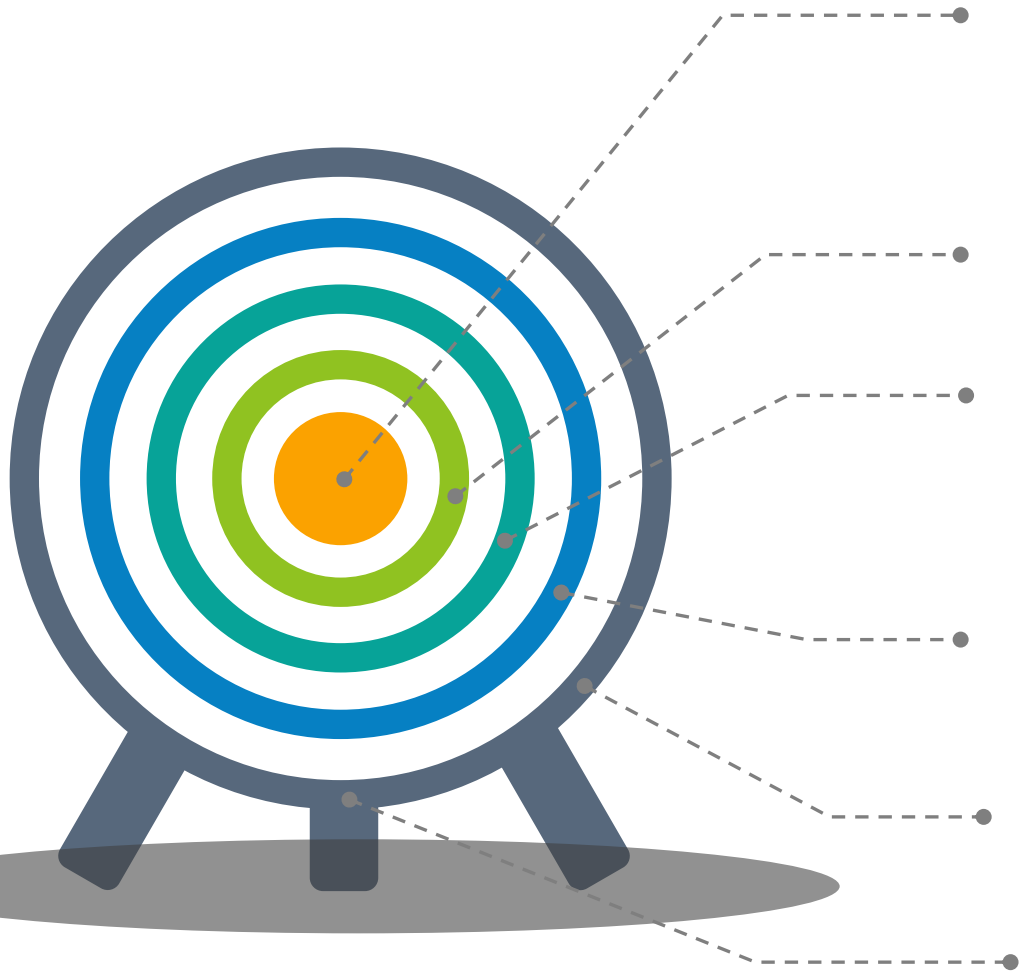
Formalizing AM: Key Opportunities



Service Levels
- Aging assets impacting student/user experience
- Inconsistent approach to service levels and preventative maintenance

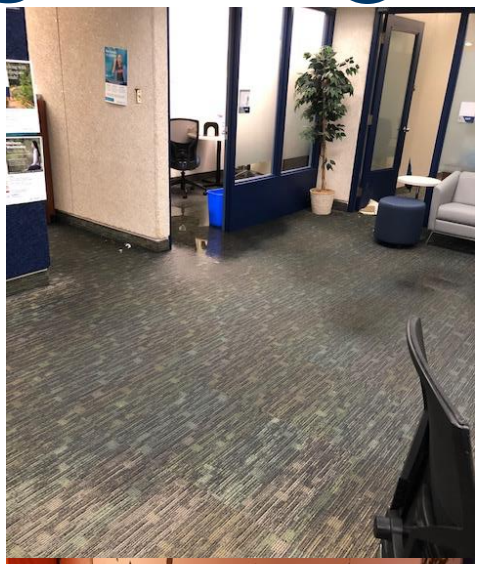
Risk Management
- Inherent risk associated with assets
- Aging buildings, inefficient energy systems

Investment Planning
- Limited capital funding, better prioritisation needed
- Reactionary capital spending and lack of process to support a planful approach

Asset Data and Knowledge
- Fragmented data
- No single, correct source of information

Operations and Maintenance
- Too many incidents requiring tactical “fire-fighting”

Governance and Collaboration
- Departments and faculties working independently
- Inefficient use of resources



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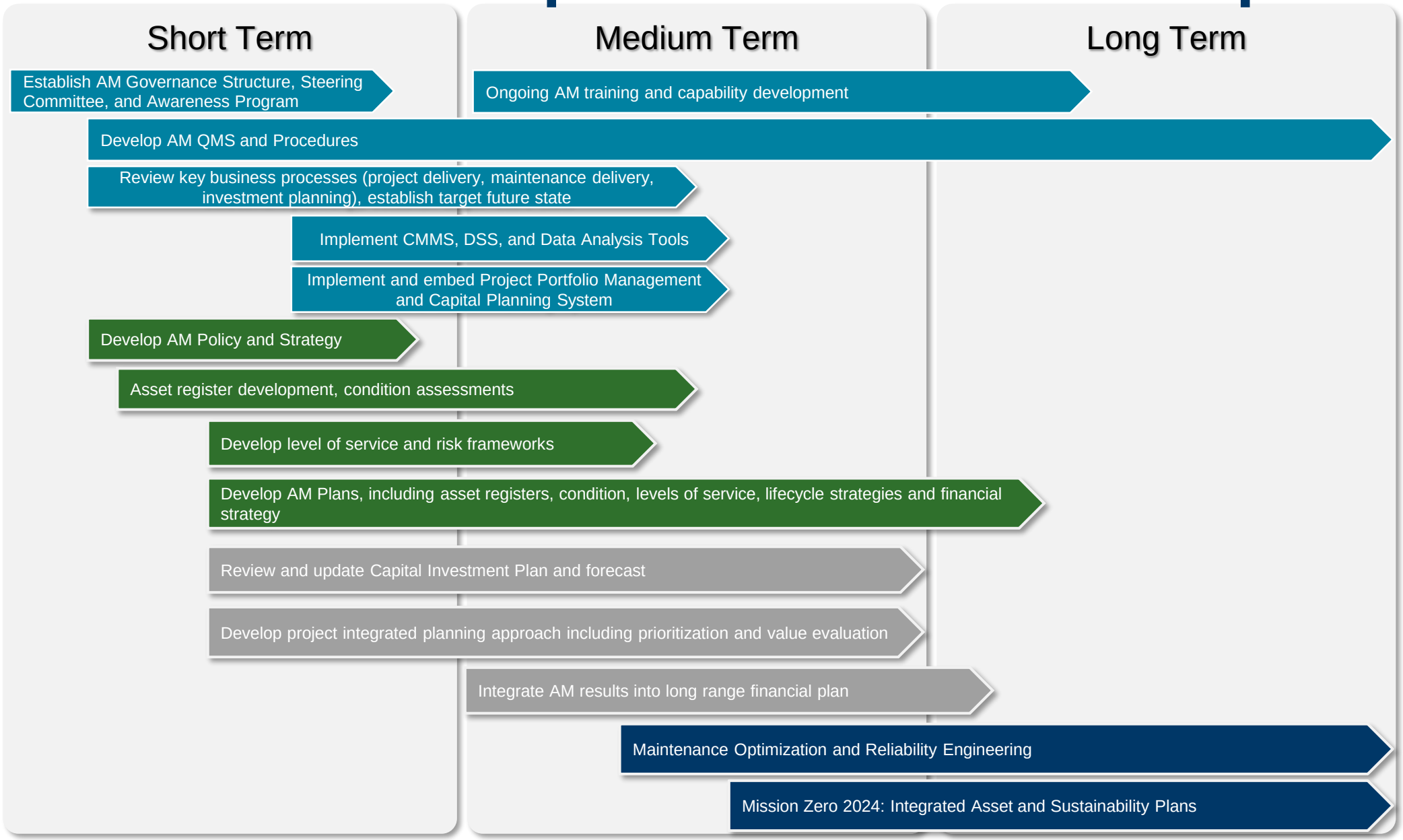
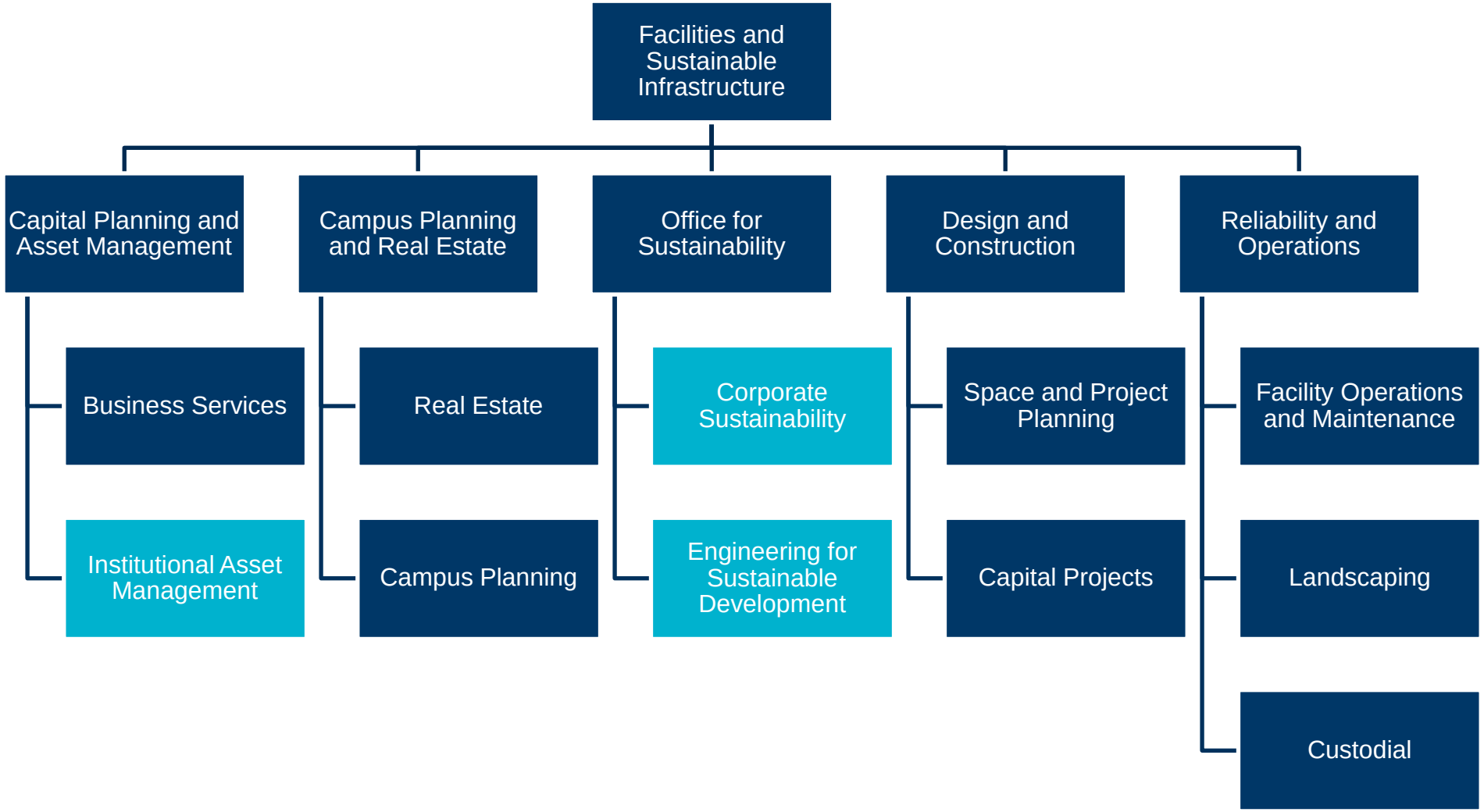
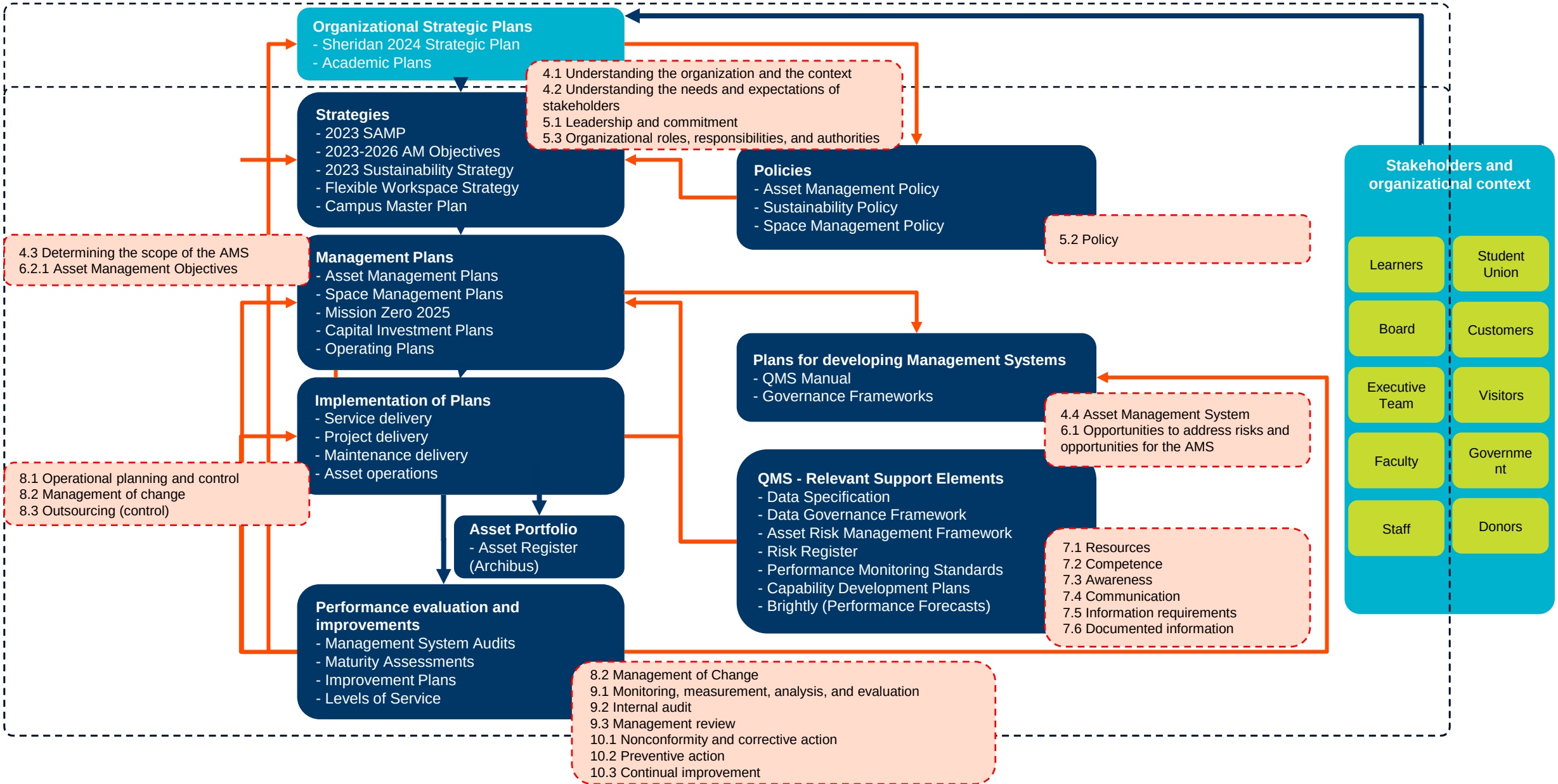
Initial AM Implementation Roadmap



Building the Team



Establishing our Asset Management QMS



Guiding Visions and Strategies

Sheridan | 2024

Galvanizing Education for a Complex World

SHERIDAN COLLEGE
INSTITUTE OF TECHNOLOGY & ADVANCED LEARNING

INTEGRATED ENERGY & CLIMATE MASTER PLAN

Final Report
Dated June 17, 2013

Sheridan mission zero

Prepared for:
Sheridan College
1430 Trafalgar Road,
Oakville, Ontario L6H 2L1

Prepared by:
Sheridan Integrated Energy & Climate Master Plan Taskforce

Sheridan College, 1430 Trafalgar Road, Oakville, ON, L6H 2L1
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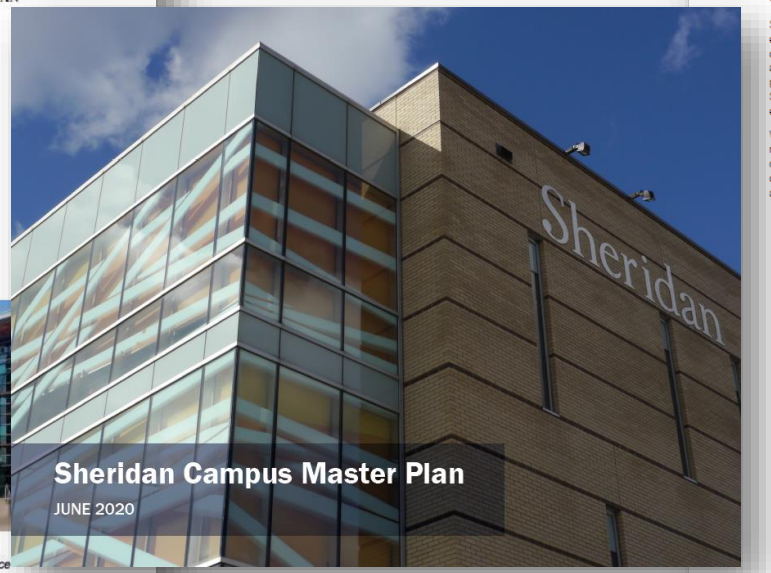

Asset Management Principles

Sheridan is the epicentre for ground-breaking, standard-setting higher education that unleashes everyone's full potential and empowers people to flourish in and shape an ever-changing world. We cultivate resourceful, highly skilled, and creative people and communities through cross-pollinated, active learning and the relentless incubation of new ideas. This is dependent on a diverse portfolio of physical assets that must be managed effectively throughout their lifecycle. In our Asset Management System, an asset is a physical item of value that is owned and managed by Sheridan such as facilities, equipment, and properties. Non-physical assets or intangible assets are currently outside of the scope.

We are committed to maximizing the value that our assets provide to the Sheridan community by managing their performance, risks, and expenditures in an optimal and sustainable manner. Through our asset management system, we will enable Sheridan's Strategic Plan and support Sheridan's continued position as a recognized leader in innovation, creativity, and sustainability. This will be achieved by the continual improvement of Sheridan's asset management system that ensures:

- **Adequate Levels of service:** Our learning community's experience and priorities are at the centre of asset management decision-making. We strive to meet Sheridan's growth and service improvement goals while meeting our level of service targets.
- **Minimized Risks:** Our risks and hazards are managed as low as reasonably practicable in alignment with the Enterprise Risk Management Framework. We comply with legislation, regulations, statutory requirements, policies, contractual obligations, health and safety requirements, and other requirements to which we subscribe.
- **Prudent lifecycle delivery:** We efficiently and effectively execute the plans for acquiring, operating, maintaining, renewing, and disposing of assets using the best possible approaches and most appropriate information systems.
- **Sufficiency and suitability:** We optimize our assets to provide sufficient capacity and suitable function for present and future needs.
- **Transparent and informed decision-making:** We use evidence-based and systematic approaches to asset management that are transparent and collaborative. Use of reliable information systems, including new technologies, to obtain high-quality data that enable the best possible decisions.
- **Value and sustainability:** We maximize the benefits and return on investment while minimizing total cost of asset ownership. Consideration of the full lifecycle of assets to develop plans that are sustainable, efficient and support mission zero, and integrate them into budgets and the long-term financial plan.
- **Embedded continuous improvement:** Our asset management practices, processes, and capabilities are continually improving and regularly audited. A culture of asset management excellence is fostered.

All members of the Sheridan community have a shared responsibility to align with these principles and contribute towards the continuous improvement of the asset management system. Sheridan will provide sufficient information, training, and resources to enable this to be achieved.

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Galvanizing Education for a Complex World

STRATEGIC ASSET MANAGEMENT PLAN

October 4, 2023

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Embedding AM and Sustainability into our Business Plans

Sheridan
Facilities and Sustainable Infrastructure

PURPOSE
To provide Sheridan students, faculty, and staff safe and inspiring environments to live, learn, work, collaborate and innovate.

VISION
To sustainably provide a world-class service and experience, be the best place to work, and ensure operational excellence.

OUR PRIORITIES

	DELIVER A WORLD-CLASS SERVICE	ENSURE OPERATIONAL EXCELLENCE	BE THE BEST PLACE TO WORK	BE SUSTAINABLE
WITHIN 1 YEAR	• Long-term enrolment plan linked to space • Customer satisfaction rating and improvement plan • Level of service framework • Space Planning Specialist • Flexible workspace strategy implementation planning • Digital wayfinding solution (with IT) • Facility Responsibility Charter • Centre for Healthy Communities Design	• AM Policy and SAMP • Business processes and procedures • Project delivery process implementation • Benchmarking and performance measures • Archibus CMMS • Implement integrated planning processes • Risk management framework • FSI Knowledge Hub (Sharepoint) • 10 year capital plan	• Social and wellness committee • Social and wellness newsletter • Social and wellness events • All team events • Team satisfaction rating and improvement feedback	• Detailed asset management and financial plans • Corporate sustainability strategy • Continuous improvement roadmap for each department • Shovel ready projects • Mission Zero 2024 • Design Guidelines and Technical Standards • Fletchers Creek Valley Plan • Real estate strategy
FUTURE ITEMS	• Client advisory boards • Accessibility audit • Common area design strategy • Flexible Workspace Strategy Implementation	• QMS certification • Major capital projects for the next 10-20 years are conceptually identified and broad cost estimates are available. • Service delivery reviews • Incorporate lean principles into our processes	• Succession/ development plans • Internal AM and Sustainability training programs	• Integrated Asset Management and Sustainability Plans • Building and district energy system-specific carbon and energy reduction plans • Zero Waste Sheridan Plan • Smart campus strategy

Levels of Service as a Business Planning Tool

Asset Level of Service Framework

ID	Asset Class	Key Service Attribute	Level of Service Statement	Performance Measure	Performance
B2	Facilities	Accessibility & Inclusion	Sheridan will use universal design principles and technology will be integrated into space planning and learning design with the goal of full accessibility for everyone.	Number of AODA-based complaints/needs (inaccessible buildings, lack of ramp, elevators not working)	DAV - 4 TRA - 5 HMC - 1
B4	Facilities	Accessibility & Inclusion	Sheridan will provide inclusive spaces (indigenous spaces, multi-faith spaces, LGBTQ2+, quiet rooms, sensory friendly rooms)	Number of breastfeeding/lactation rooms (breastfeeding, pumping)	DAV - 0 TRA - 0 HMC - 0 (indevelopment)
B5	Facilities	Accessibility & Inclusion	Sheridan will provide inclusive spaces (indigenous spaces, multi-faith spaces, LGBTQ2+, quiet rooms, sensory friendly rooms)	Number of adequate, safe gender inclusive (universal) washrooms, change rooms	DAV - 6 TRA - 2 HMC - 6
B6	Facilities	Accessibility & Inclusion	Sheridan will provide inclusive spaces (indigenous spaces, multi-faith spaces, LGBTQ2+, quiet rooms, sensory friendly rooms)	Number of Indigenous spaces per campus	DAV - 1 TRA - 1 HMC - 0
B7	Facilities	Accessibility & Inclusion	Sheridan will provide inclusive spaces (indigenous spaces, multi-faith spaces, LGBTQ2+, quiet rooms, sensory friendly rooms)	Number of multi-faith spaces per campus	DAV - 1 TRA - 2 HMC - 0 (in development)
B11	Facilities	Safety	Sheridan will strive to ensure that facilities are a safe environment and foster feelings of safety and personal comfort in which to learn, live, work and grow.	Customer awareness testing compliance (semi-annual testing)	100%
B12	Facilities	Safety	Sheridan will strive to ensure that facilities are a safe environment and foster feelings of safety and personal comfort in which to learn, live, work and grow.	Emergency procedure posters are in compliance with all standards	100%
B14	Facilities	Safety	Sheridan will strive to ensure that facilities are a safe environment and foster feelings of safety and personal comfort in which to learn, live, work and grow.	Average number of wayfinding complaints per month	12
B15	Facilities	Quality	Sheridan will provide high-quality facilities that showcase Sheridan's brand identity to enhance the experience of everyone on campus.	Percentage of facilities assets in fair or better condition	90%
B19	Facilities	Environmental Sustainability	Sheridan's facilities will set new standards for energy efficiency and environmental sustainability.	Number of indoor air quality complaints (smells, dust, humidity)	TRA - 2 DAV - 1
B30	Facilities	Regulatory	Sheridan will ensure that all asset management delivery activities are carried out in accordance with the Ontario Building Code, and other applicable regulations.	Number of Joint Health and Safety concerns related to facilities	17

Quarterly Performance Benchmarking Report

DELIVER A WORLD-CLASS SERVICE AND EXPERIENCE		
Provide the best customer service		
Mean project client satisfaction score	score out of five	4.17
Mean work order satisfaction score	score out of five	Future
Deliver safe and reliable campuses		
Elevator uptime	%	Future
Space uptime	%	Future
Number of outstanding safety improvements required at facilities	ea	Future
Average space renewal ratio	%	9%
Number of assets with high or extreme risk ratings	ea	212.00
Ensure inspiring, inclusive and high-quality campuses		
Mean space satisfaction score	score out of five	4.80
Percentage of assets in fair or better condition (by replacement value)	%	90%
Inclusive space availability	%	100%
Gross floor area per student FTE	sq ft/FTE	120
Office space per employee FTE	sq ft/FTE	101
Percentage of functionally suitable spaces	%	99%
ENSURE OPERATIONAL EXCELLENCE		
Continuously improve our processes and plans		
Mean asset management maturity	score out of five	2.58
Ensure service delivery excellence		
Mean work order completion time	days	1.60
Preventative maintenance schedule compliance	%	Future
Space renewal in implementation	sq ft	149,774
Estimate at Completion as a percentage of Planned Budget	%	99.9%
Average age of projects	Months	15

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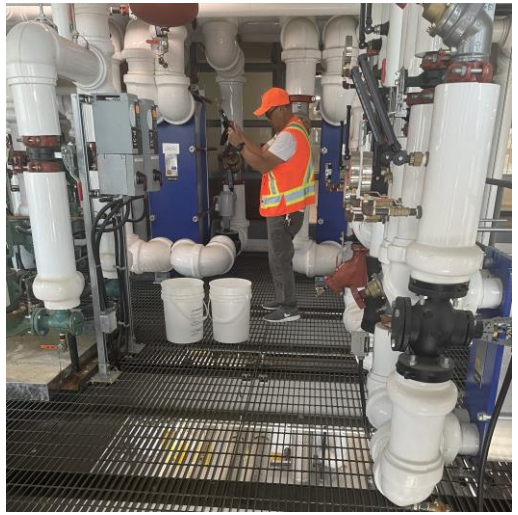
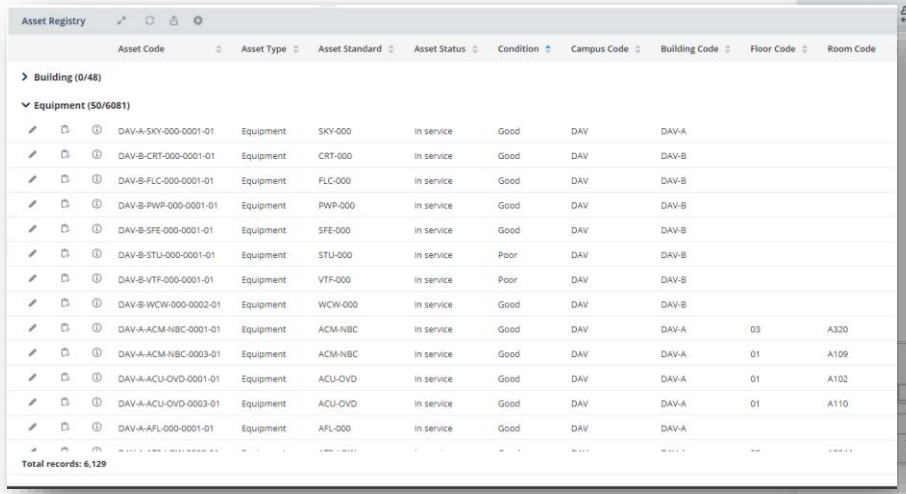
Building our Asset Knowledge

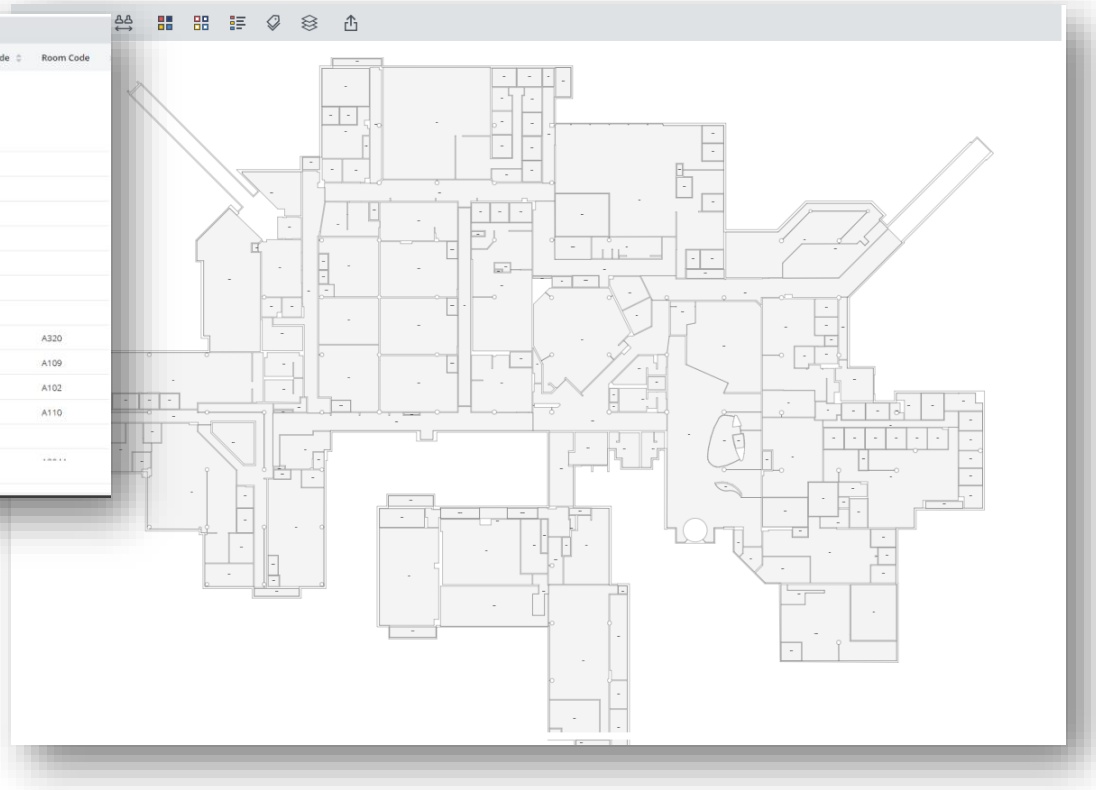
Collecting the Registry and Condition Data



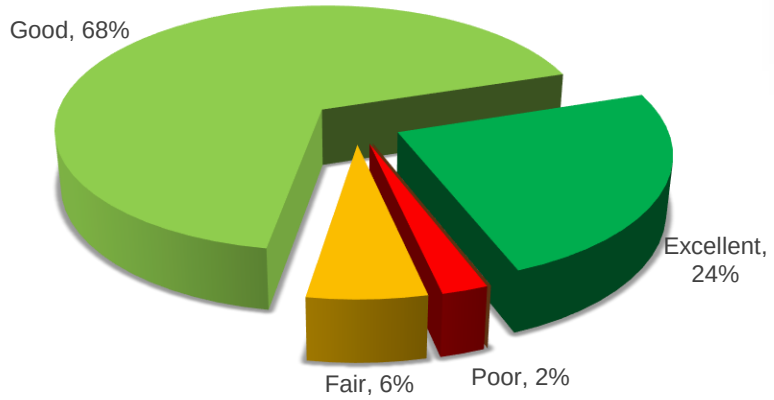
Building the Register



Linking to space and occupants/users



Understanding Health / Condition



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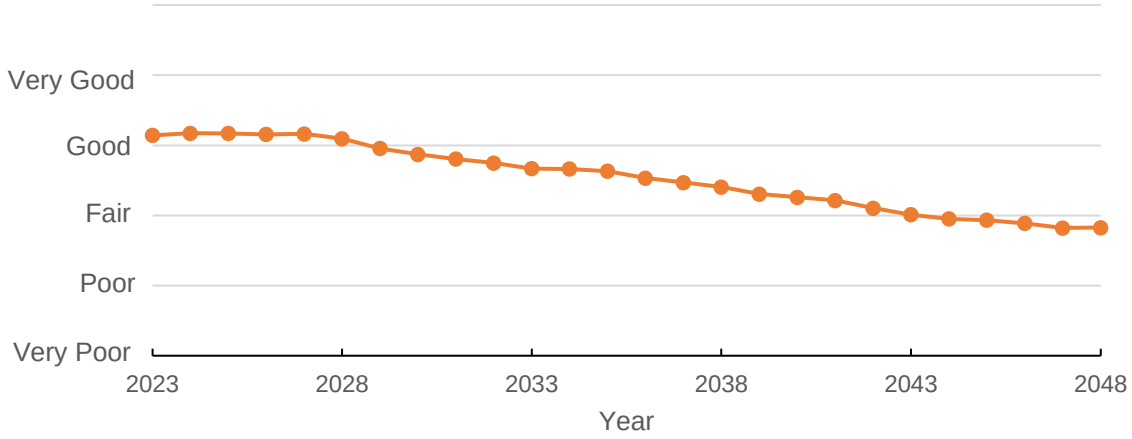
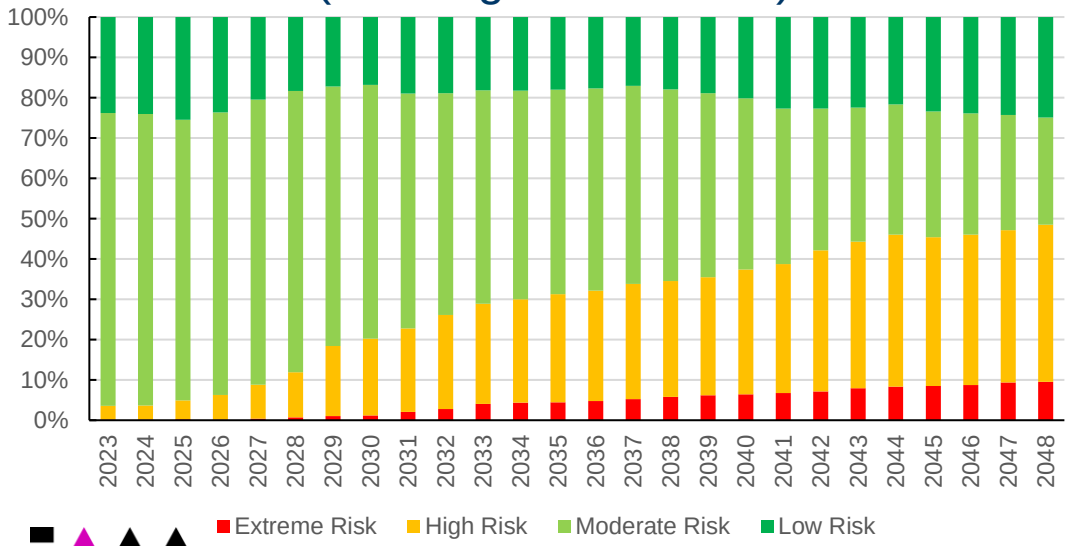
Understanding Condition and Risk Exposure

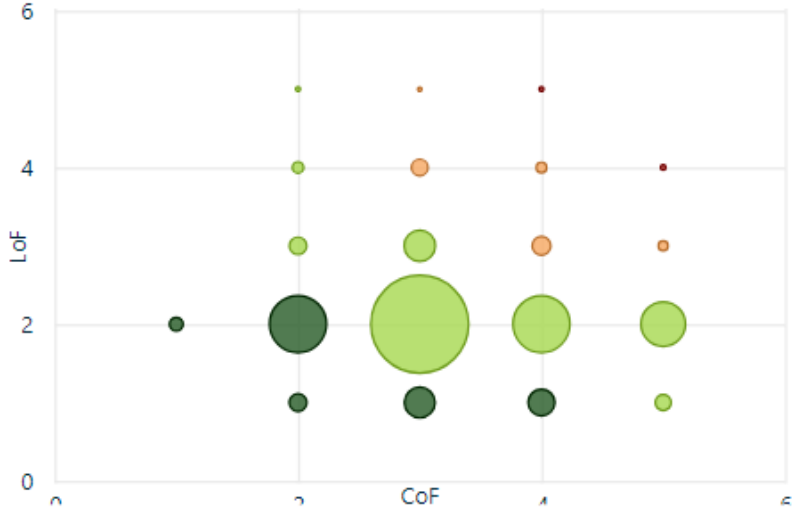
Average Performance Forecast (Funding Constrained)



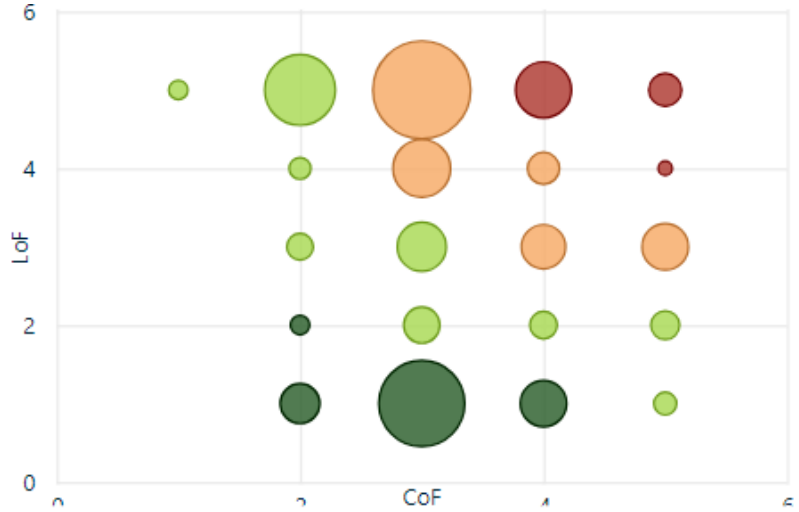
Risk Forecast (Funding Constrained)



Risk Matrix (Present)



Risk Matrix (25 Years)



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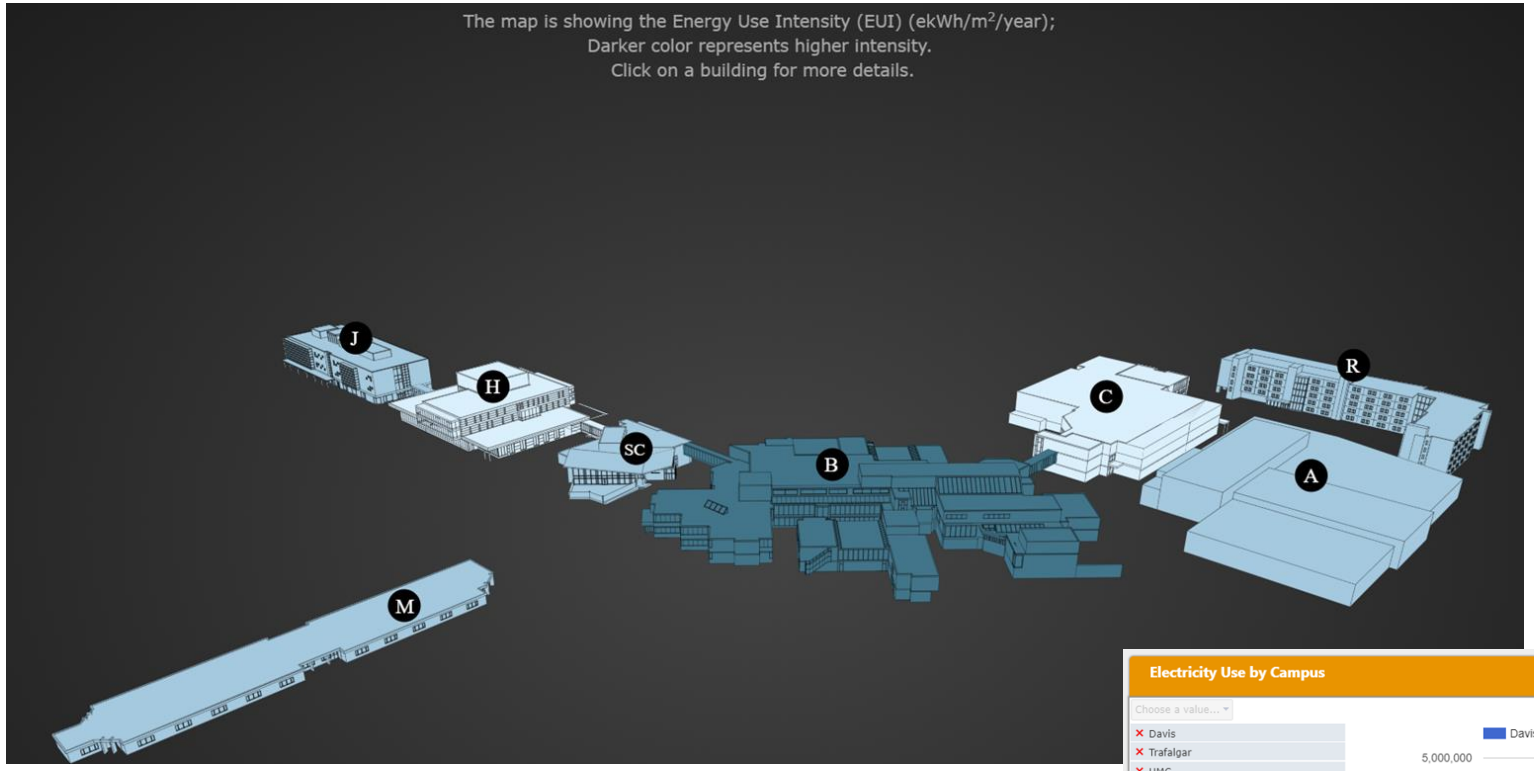
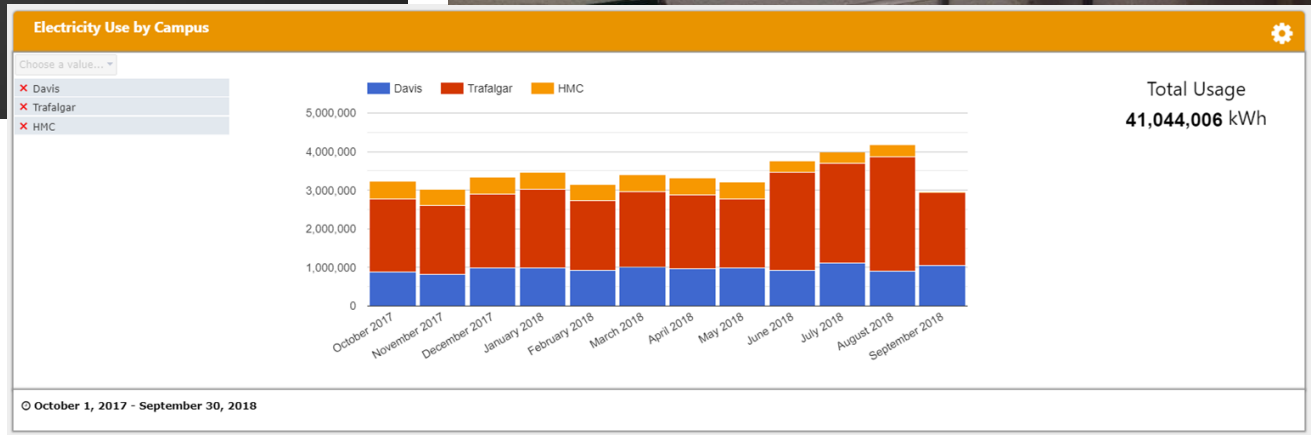
Measuring Asset Performance





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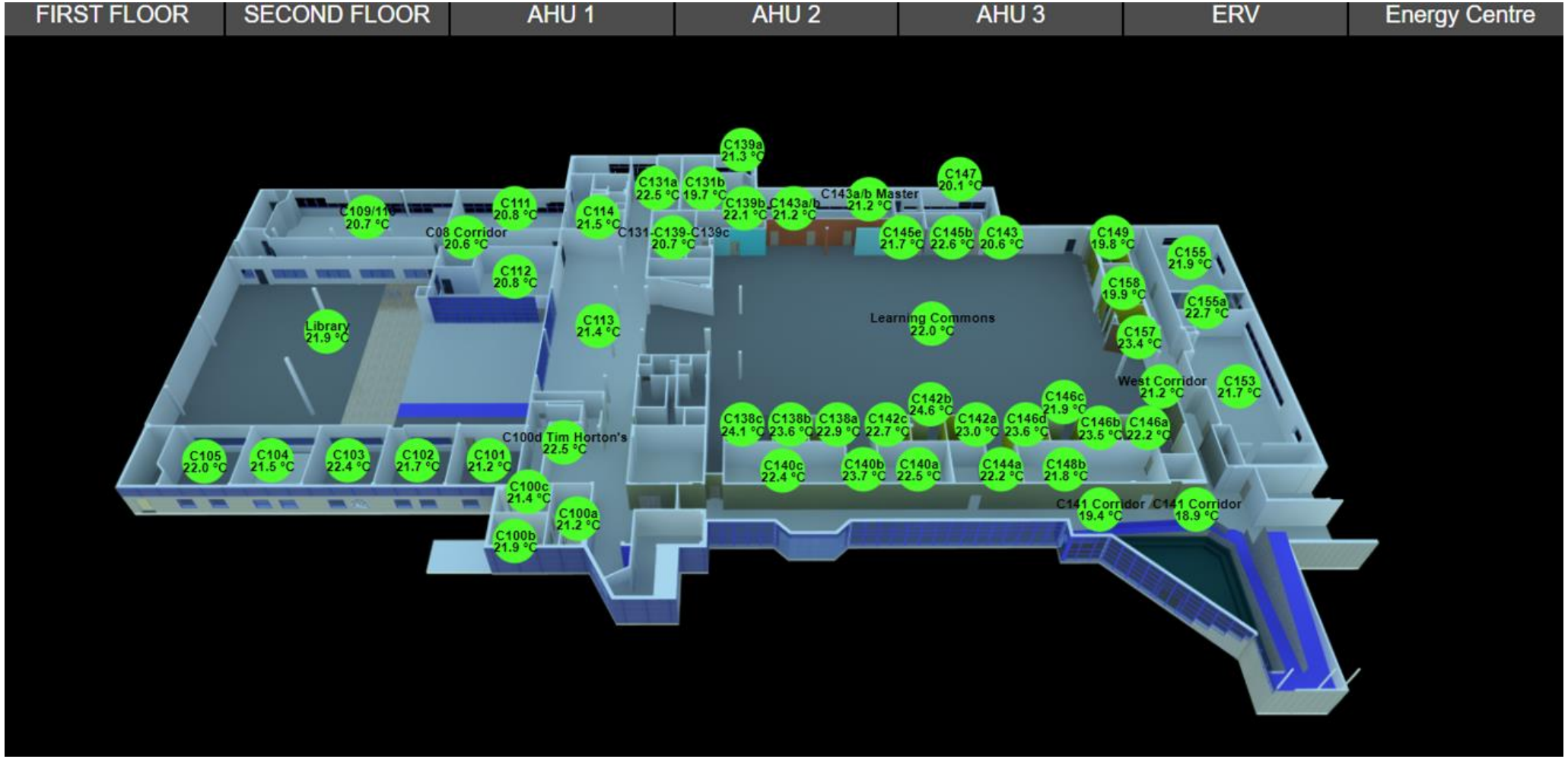
Real-Time Measurement



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Integrated Planning for the Whole Lifecycle

Office for Sustainability

- Asset Performance
- Sustainable Development

Reliability and Operations

- Reliability, Availability, and Maintainability
- Operations
- Safety and responsiveness

Capital Planning & Asset Management

- Asset Lifecycle
- Risk
- Levels of Service

Design and Construction

- Constructability
- Configuration and space
- Logistics

Campus Planning

- Growth and demand
- Planning and development

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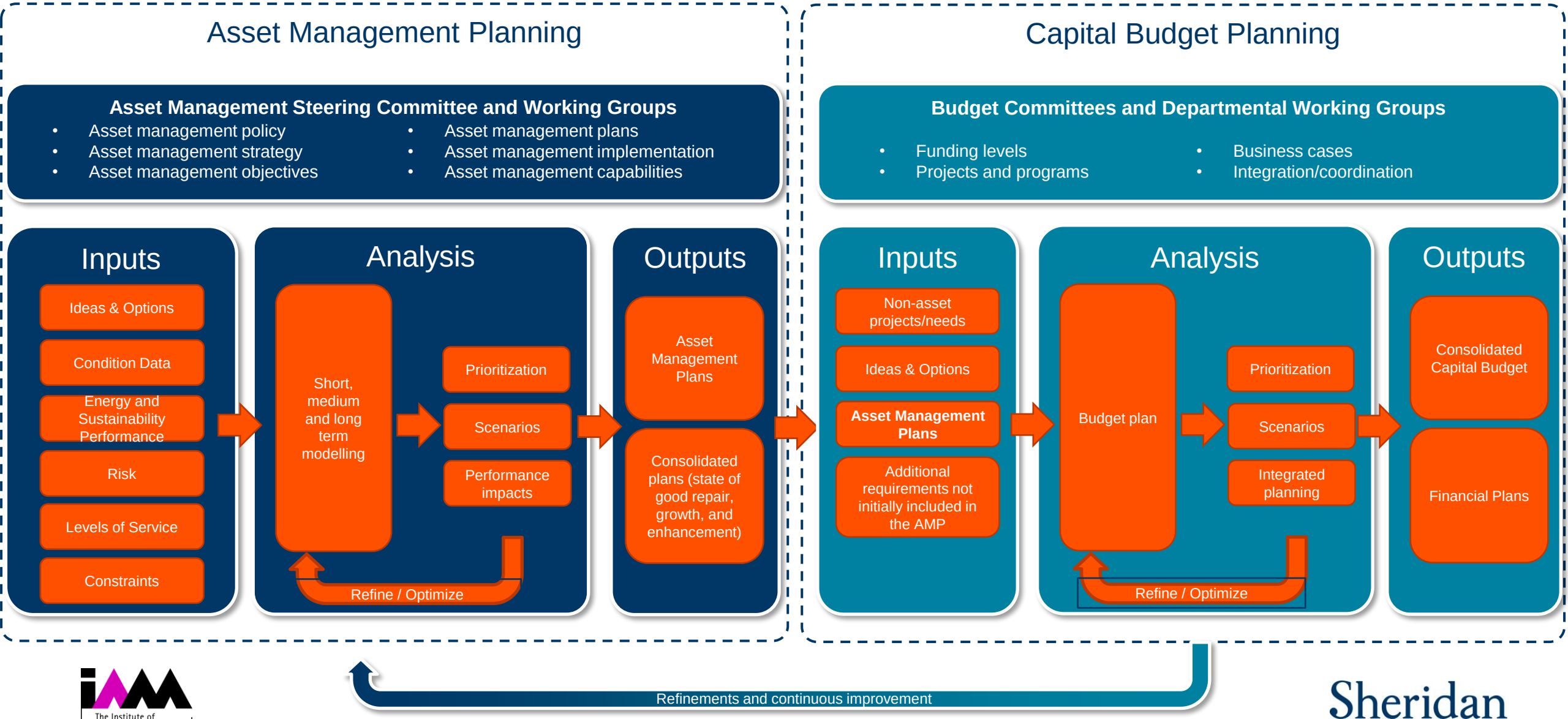
AM as the Foundation of Planning Processes



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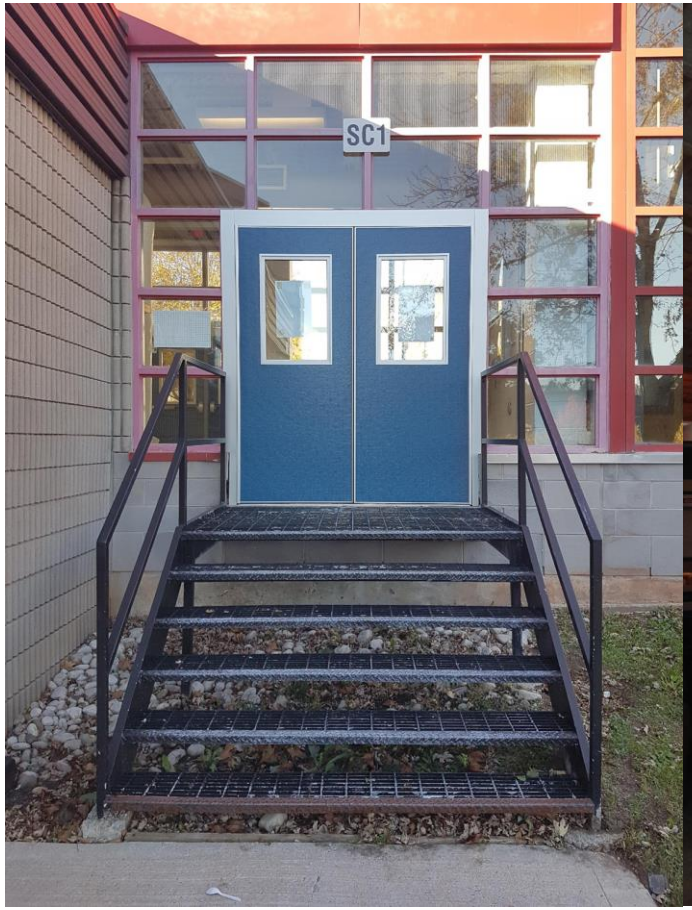
Implementation: Bundling SOGR and Performance Enhancements



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Zone and Lighting Controls

55% of the buildings at the Oakville Campus have been mechanically retrofitted

35% of the buildings at the Brampton Campus have been mechanically retrofitted

55% of corridor spaces have been converted over to LED lighting

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Establishing Standards for New Buildings

Davis | A-Wing

Construction

- Started spring 2015
- Opened in January 2017

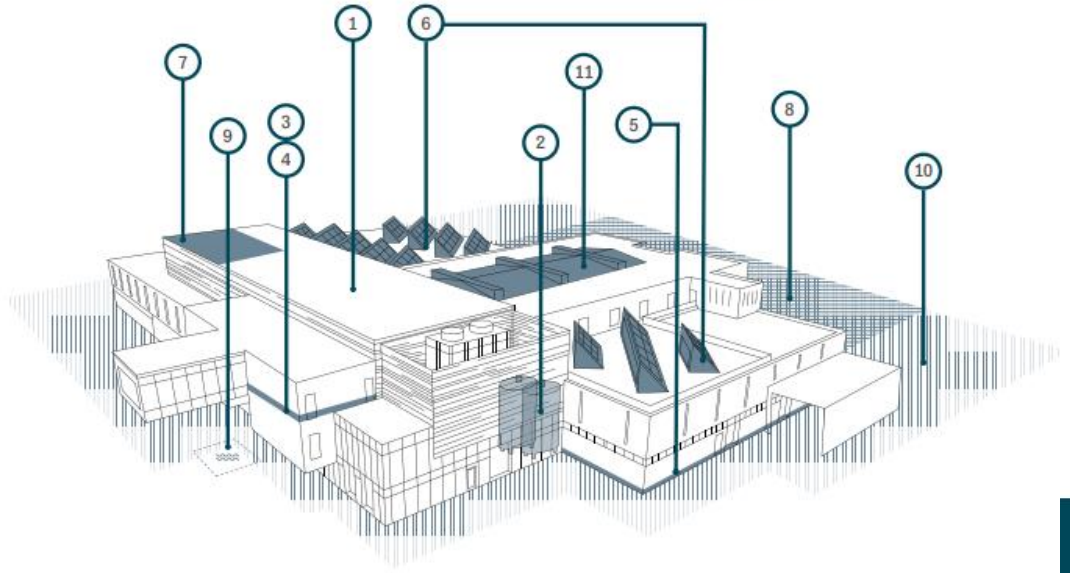
Area

- 131,126 ft² (12,182 m²)

Function

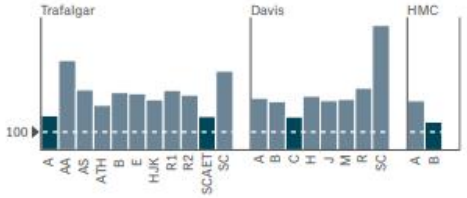
- Classrooms, labs, offices, Learning Commons, and **District Energy Centre**
- Home to the **Skilled Trades Centre**

See next page for details.



All new Sheridan buildings have a site energy performance target of <100 ekWh/m²/year.

Energy consumption by campus

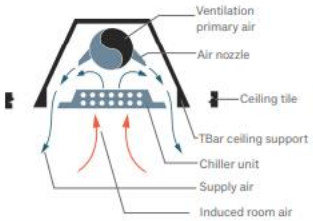


Smart buildings

1 **Building controls** – Davis A-Wing and HMC B-Wing both have schedules and sensors to reduce building energy use. For example, when the building is unoccupied, lights automatically dim or shut off and the space's temperature adjusts closer to the outdoor temperature.

Energy efficiency

3 **Chilled beams** – Cold water passes through the chilled beams to cool individual spaces and offer personalized temperature controls. Water-based (hydronic) systems use less energy than air-based systems because water holds more heat energy per unit than air, so less of it needs to be circulated around the building.



2 **Thermal storage** – Insulated storage tanks at the Davis A-Wing store heating and cooling water that's used during peak hours of high demand and cost.

Living lab – Davis A-Wing has learning opportunities for **Integrated Energy Systems** and **Electrician** programs. HMC B-Wing has view windows for building services, mock-up sculptures, and educational signs.

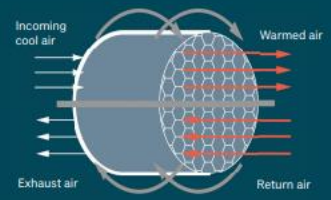
4 **Free cooling coils** – On cooler days, free cooling can bring fresh outdoor air to cool indoor spaces. Free cooling coils are part of the mechanical equipment and achieve this in a more controlled way than opening a window.

5 **In-floor radiant heat** – In-floor radiant heating is the most efficient way to heat high-ceilinged spaces because the heated concrete is warm in the lowest areas of the space (where people are located).

6 **Solar** – Davis A-Wing has 27 kW of rooftop solar panels for hands-on education. The panels can produce enough electricity to power more than four homes for a year. Both buildings have solar thermal collectors that are used to heat water for washrooms (instead of using natural gas to heat it).

7 Energy recovery

Fresh air needs to be brought into the building constantly to flush out stale air and contaminants. The air handling unit transfers heat between fresh and used air without mixing them. This reduces how much natural gas must be used to heat incoming fresh air up to indoor temperature.



Enthalpy wheel in winter operation

Building envelope

Insulation – High levels of insulation and envelope sealing help prevent loss of conditioned air to the outdoors.

Doors – The buildings both have revolving doors that reduce conditioned indoor air from escaping every time the door is used.

Air curtains – Air curtains help prevent the mixing of indoor and outdoor air at entrances.

Water management

8 **Permeable pavers** – Permeable pavers are built with intentional large gaps to allow water to freely drain through. They also direct water to recharge groundwater supplies, help prevent runoff from paved surfaces, and reduce standing water.

9 **Rainwater** – Rainwater from the roof is collected into a storage cistern and used to flush toilets and urinals in the building's washrooms. This serves the dual purpose of managing stormwater for the site and reducing use of potable water. These cisterns each hold tens of thousands of litres of water.

10 **Snowmelt** – Both buildings have a snow melt system. It uses a combination of glycol and water to melt snow and ice when outdoor temperature is below freezing, and moisture is detected on the ground. This keeps walkways safe and minimizes need for salt compounds that can adversely affect local aquatic ecosystems.

Low flow fixtures – Both buildings use low-consumption plumbing fixtures that provide excellent water efficiency. Toilets and urinals use stored rainwater first before tapping into clean drinking water.

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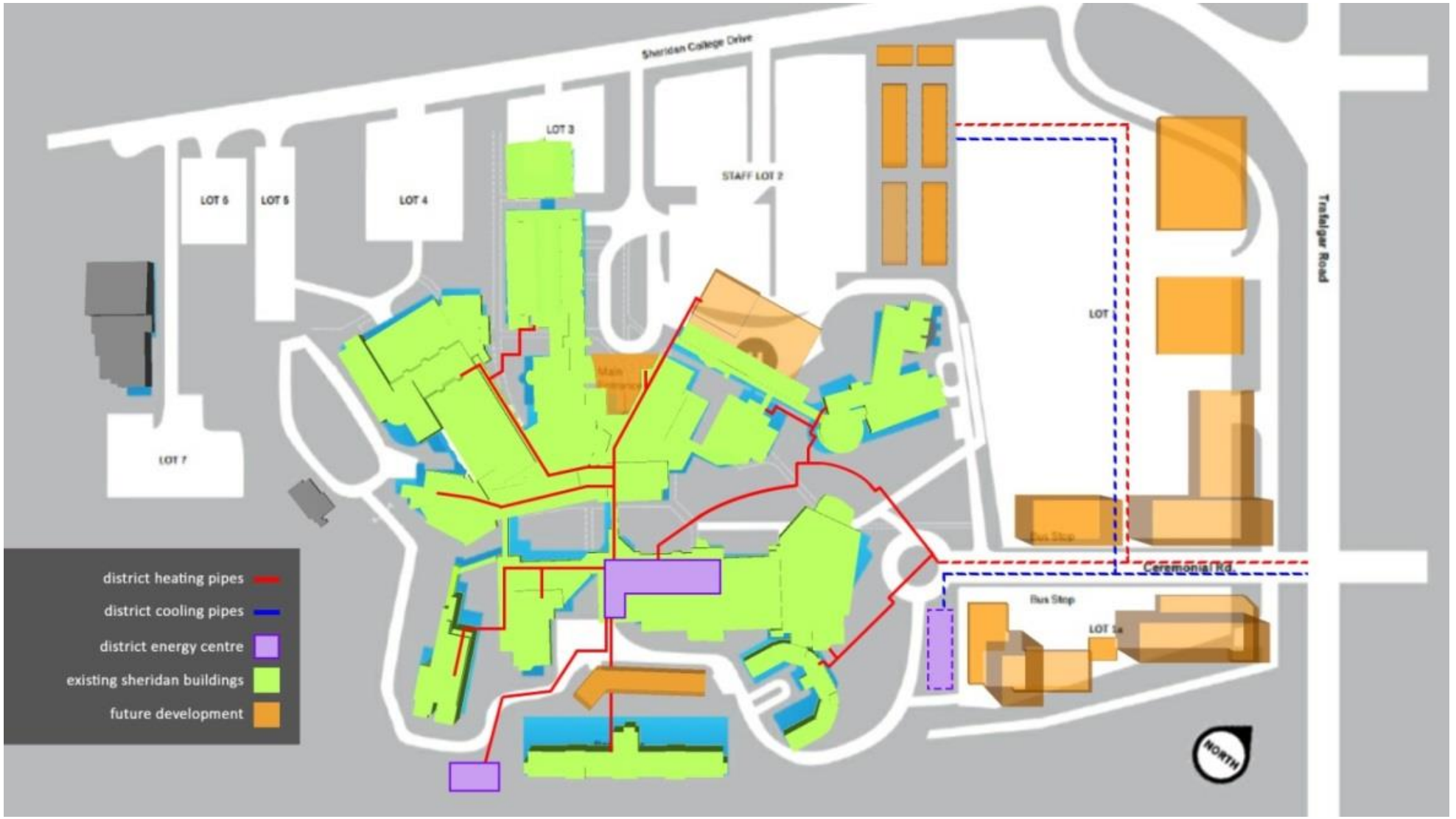
Modernizing Energy Infrastructure



District Energy: Laying the Ground Work

District Energy: Laying the Ground Work

Retrofing Existing Buildings with Sustainable Energy Systems

Making Infrastructure Visible to Students

Building a Culture of Sustainable Asset Management

Sheridan mission zero

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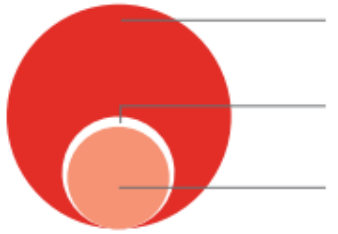
Achieving Tangible Results

Sheridan mission zero

Goal –
Reduce GHG emissions from energy use by 50% by 2030.

Carbon emissions (tons)



Baseline 2010/2011
15,467 t

Goal 2019/2020
7,734 t ▼50%

Actual 2018/2019
7,044 t ▼54.5%

Goal –
Use 50% less source energy by 2030.

35% less energy used per student between 2010/2011 and 2018/2019

In 2018/2019 both electricity and natural gas use went down at Trafalgar Road Campus by 24.1% and 14.4%, respectively, relative to the 2010/2011 baseline.

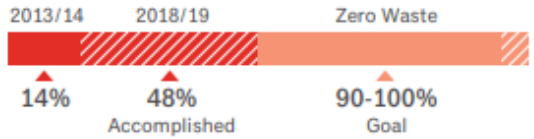
Total energy use reductions were higher at Trafalgar (21.7%) than Davis campus (8.1%). This was most likely due to a significant increase in enrolment at Davis.

Goal –
Become a Zero Waste campus

Waste

Sheridan reduced total waste produced across all of our campuses by 23% (365 metric tonnes) in 2018/2019. This includes a 54% (732 metric tonnes) reduction in landfill waste and 167% (367 metric tonnes) increase in recycling and organics. These numbers are relative to data from before the introduction of the **Zero Waste** program (2013/2014).

During this same period, Sheridan increased our diversion rate (i.e. less waste to landfill) from 14% to 48%.



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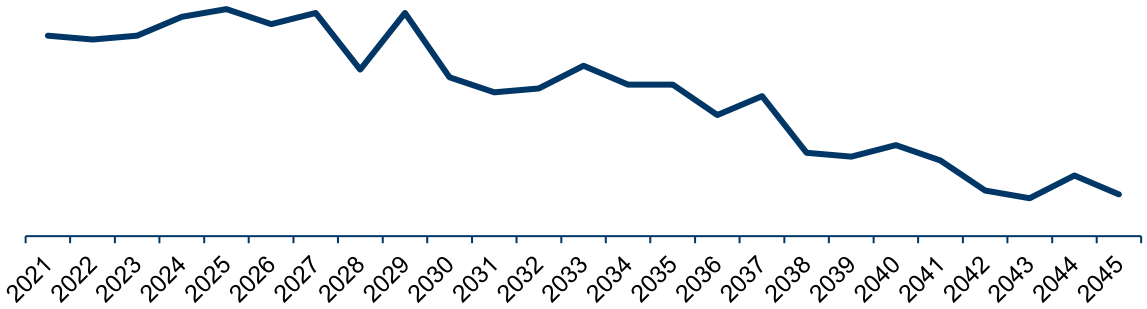
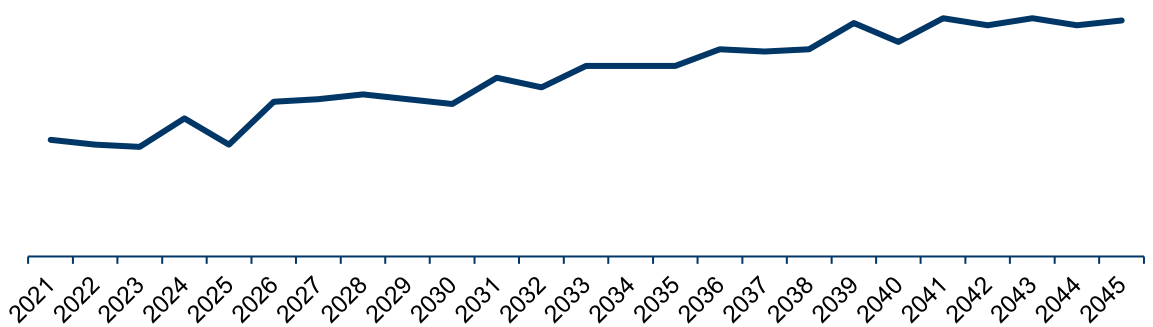
Our Next Iteration – Mission Zero 2024

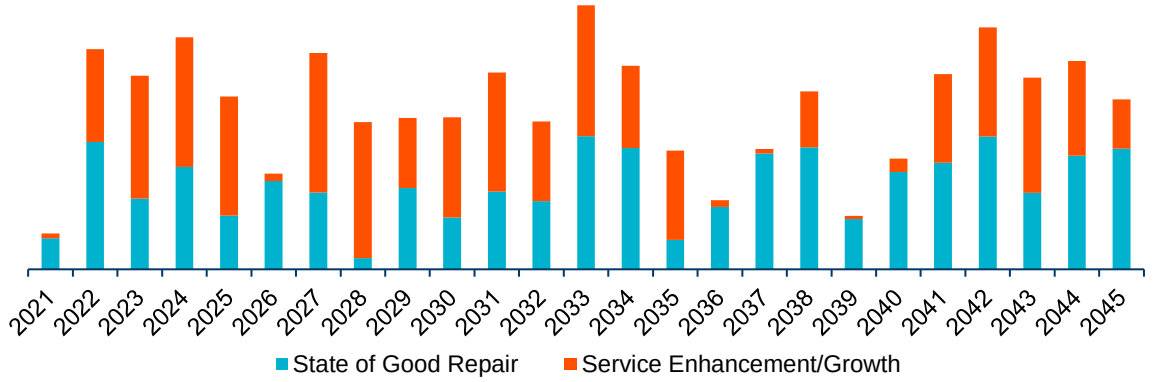
Continuing on our path to net zero



Meet growth and service level targets



Creating integrated asset management strategies and plans



Sheridan mission zero

The Institute of Asset Management

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Thank you

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