UNIVERSITY OF TORONTO
MISSISSAUGA

LINEAR ASSET MANAGEMENT PLAN
EXECUTIVE SUMMARY
2025

UNIVERSITY OF TORONTO MISSISSAUGA

DEFY GRAVITY

LAND ACKNOWLEDGEMENT

We wish to acknowledge this land on which the University of Toronto operates. For thousands of years it has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

MISSION

The University of Toronto Mississauga (UTM) advances knowledge through exceptional teaching, research and community engagement. As a vibrant hub of innovation within Canada's leading research university, UTM combines academic excellence with a unique balance of urban opportunity and natural beauty to empower students and scholars to shape society. Guided by fiscal responsibility and sustainability, we steward our campus assets through evidence-based decision-making — optimizing infrastructure investments and building resilience for the future.

VISION

UTM envisions a vibrant, inclusive, and forward-thinking academic and research community that fosters the development of thoughtful, empathetic and globally engaged citizens. We strive to cultivate a learning environment where students are empowered to think critically, act with integrity and contribute meaningfully to society. Through a commitment to excellence in teaching, interdisciplinary research and community collaboration, UTM supports intellectual growth and personal development for all members of its diverse community. In alignment with this vision, UTM is dedicated to establishing a sector-leading integrated asset management program that fosters a culture of collaboration, innovation and continuous improvement in the stewardship of campus infrastructure — ensuring a sustainable, resilient and supportive environment for future generations of learners, teachers and researchers.

JOINT LEADERSHIP MESSAGE

At the University of Toronto Mississauga, we recognize that climate change, aging infrastructure and the increasing complexity of campus operations demand strategic, informed and future-ready asset stewardship. Our Linear Asset Management strategy provides a clear and actionable roadmap for maintaining and renewing the critical linear infrastructure that forms the backbone of campus life.

This plan is rooted in data, guided by community needs and aligned with our core values of fiscal responsibility, operational excellence and service to our community. By investing today in thoughtful planning, targeted renewal and proactive maintenance, we are strengthening campus safety, accessibility and resilience.

Our commitment is not only to preserve the physical fabric of UTM, but also to empower it to support world-class teaching, learning and research for generations to come. Together, we are building a campus that is adaptable, sustainable and inclusive — where infrastructure enables innovation and inspires excellence.

This vision comes to life through the work of our dedicated teams, whose efforts translate strategy into action. The following message from our Chief Administrative Officer highlights how the Linear Asset Management Plan is being implemented on the ground — ensuring that our shared vision is embedded in every decision, project and investment we make.

Luke Barber
Executive Director,
Digital & Physical Infrastructure

Ahmed Azhari
Managing Director,
Operations, Sustainability &
Asset Management

Sameem Shah
Senior Manager,
Infrastructure & Asset Management

MESSAGE FROM THE CHIEF ADMINISTRATIVE OFFICER

UTM's growth, vibrancy and resilience depend on a strong physical foundation — one that is thoughtfully planned, diligently maintained and responsibly renewed. This **Linear Asset Management Plan (LAMP)** affirms our commitment to safeguarding the essential infrastructure that supports every facet of campus life.

The plan is not just an inventory of sidewalks, roads and underground utilities — it is a forward-thinking strategy that reflects UTM's priorities of accountability, community well-being and operational excellence. By consolidating data, aligning with institutional goals and applying an evidence-based approach, we are taking tangible steps to ensure our campus remains safe, functional and inspiring for generations to come.

This work is a testament to the dedication of our staff, the strength of our partnerships and the clarity of our strategic vision. I am proud of the collaborative effort behind this report and confident that it positions UTM to lead with integrity and insight in the realm of campus infrastructure planning.

Deborah Brown
Chief Administrative Officer
University of Toronto Mississauga

ACHIEVEMENTS SINCE 2023

Established the Asset Management Office in 2023

Completed campus-wide linear infrastructure condition assessments

Developed acceptable levels of service through community consultation

Developed a digital asset register and risk-based prioritization system

Aligned lifecycle strategies with Campus Master Plan, Climate Positive Plan, and UTM's Strategic Framework

Created inaugural UTM Linear Asset Management Plan

FUTURE MILESTONES

Implement a 10-year renewal funding model

Launch digital dashboard for LOS monitoring by 2026

Integrate GIS and IoT for predictive maintenance by 2027

The development of UTM's Linear Asset Management Plan (LAMP) is grounded in a structured framework that aligns with provincial regulations, industry best practices and UTM's strategic objectives. At its core, the plan follows the principles of the ISO 55000 Asset Management standard and utilizes Ontario Regulation 588/17 as best industry practice, formalizing and offering a transparent approach to asset lifecycle planning, Levels of Service (LOS), risk management and financial forecasting.

FRAMEWORK

The LAMP is built on five interdependent pillars:

1

ASSET INVENTORY AND CONDITION ASSESSMENT

A complete and geo-referenced inventory of linear assets — sidewalks, roads, sewers, watermains, parking lots and recreation surfaces — was established. Condition data were gathered through visual inspections, CCTV analysis (for underground services) and GIS-linked records.

2

LEVELS OF SERVICE (LOS)

Both technical and customer-focused LOS metrics were developed to evaluate performance and user satisfaction. These metrics provide clear targets for accessibility, reliability, safety and environmental sustainability.

3

LIFECYCLE MANAGEMENT STRATEGY

Assets were analyzed through a lifecycle lens, identifying critical maintenance, renewal and replacement interventions needed over time. Prioritization was based on risk, condition, age and service impact.

4

FINANCIAL STRATEGY AND FORECASTING

Capital renewal needs were projected over 10- and 25-year horizons, revealing a total of $71.5 million in expected reinvestment, with $28.9 million required in the next decade. Current backlog stands at $14.7 million, approximately 14% of total replacement value.

5

IMPROVEMENT PLANNING AND GOVERNANCE

An implementation roadmap was developed to guide future data refinement, digital tools integration and cross-departmental governance. Governance structures align responsibilities within Facilities Management & Planning and the Asset Management Office.

RESULTS

The LAMP has delivered significant outcomes that will shape campus operations and investments for years to come:

DATA CONFIDENCE

A cleansed and structured asset register now enables reliable decision-making and enhances capital project planning accuracy.

LOS TRACKING

Established performance thresholds allow UTM to proactively measure and report on meeting customer expectations.

RISK-BASED PRIORITIZATION

The application of weighted risk models helps direct resources to assets that pose the highest risk to service delivery and user safety.

STRATEGIC INVESTMENT PLANNING

Financial forecasting tools now allow UTM to align capital requests with long-term renewal needs.

ALIGNMENT WITH CLIMATE OBJECTIVES

The plan integrates LID (Low Impact Development) and stormwater enhancements that support UTM's Climate Positive Plan.

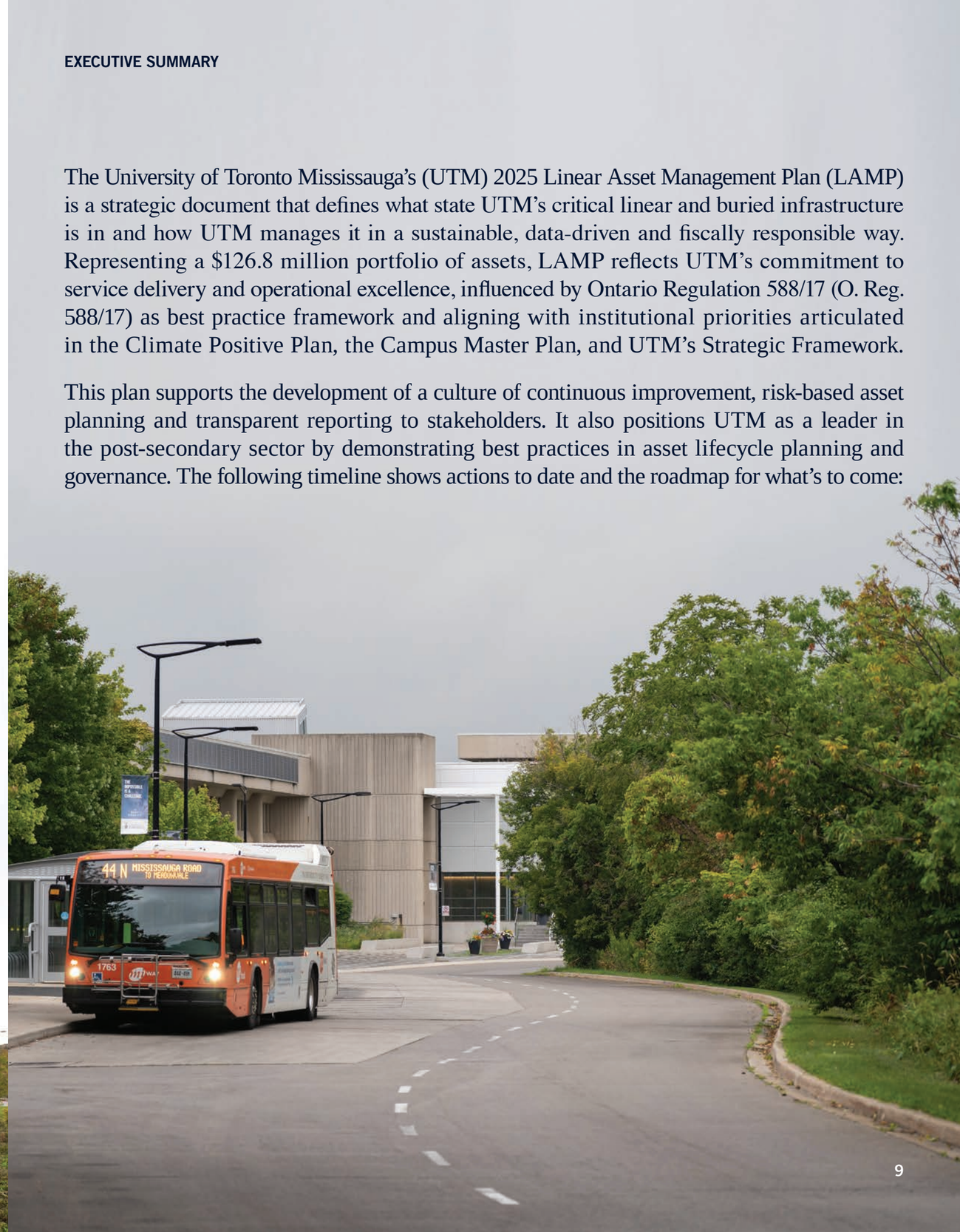
OPERATIONAL MATURITY

UTM's asset management practice has advanced from reactive maintenance to proactive planning, positioning the campus for infrastructure resilience and long-term sustainability.

Together, these framework and outcomes lay the foundation for an adaptive, accountable and performance-driven approach to managing UTM's essential linear infrastructure.

The University of Toronto Mississauga's (UTM) 2025 Linear Asset Management Plan (LAMP) is a strategic document that defines what state UTM's critical linear and buried infrastructure is in and how UTM manages it in a sustainable, data-driven and fiscally responsible way. Representing a $126.8 million portfolio of assets, LAMP reflects UTM's commitment to service delivery and operational excellence, influenced by Ontario Regulation 588/17 (O. Reg. 588/17) as best practice framework and aligning with institutional priorities articulated in the Climate Positive Plan, the Campus Master Plan, and UTM's Strategic Framework.

This plan supports the development of a culture of continuous improvement, risk-based asset planning and transparent reporting to stakeholders. It also positions UTM as a leader in the post-secondary sector by demonstrating best practices in asset lifecycle planning and governance. The following timeline shows actions to date and the roadmap for what's to come:



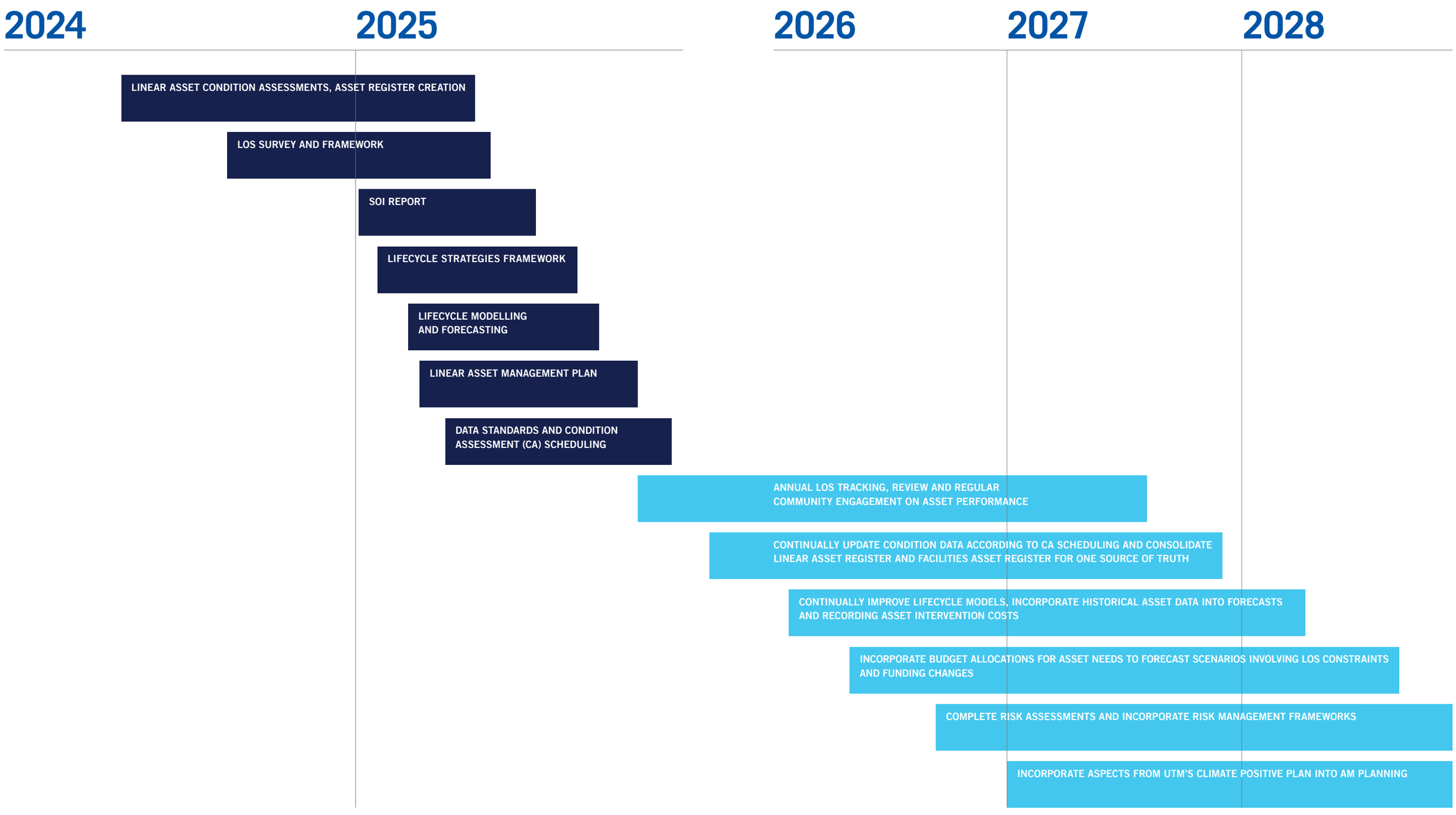


Figure 1: Timeline and Road Map

1

ASSET INVENTORY AND VALUATION

UTM's linear infrastructure includes a wide range of asset categories including but not limited to:

UTILITIES
Sanitary Sewers
Storm Sewers
Watermains
Gas Lines
Hydro Lines
Utility Service Tunnel (UST)
Geo-Exchange System (GXS)

TRANSPORTATION
Sidewalks
Walkways
Courtyards
Streetlights
Parking Lots
Roads

RECREATION
Outdoor Sports Fields
Tennis Courts

These assets support everyday campus functions including mobility, safety, emergency response and outdoor engagement. The total current replacement value (CRV) of these assets is $126.8 million, with Utilities services accounting for the largest share of value.

ASSET CATEGORIES	REPLACEMENT VALUE	AVERAGE AGE	AVERAGE ESL*	OVERALL CONDITION
UTILITIES				
Sanitary Sewers	$12.2M	36	80	Good ★★★★☆
Storm Sewers	$27.9M	51	80	Fair ★★★☆☆
Watermains	$13.2M	57	110	Good ★★★★☆
Gas	$800.7k	57	150	Good ★★★★☆
Hydro	$9.8M	14	34	Good ★★★★☆
Geo-Exchange System	$9.1M	9	75	Good ★★★★☆
Utility Service Tunnel	$4.9M	57	100	Good ★★★★☆
TRANSPORTATION				
Streetlights	$5.3M	21	40	Good ★★★★☆
Roads	$11.6M	20	75	Good ★★★★☆
On-Campus Bus Stops	$77.9k	11	25	Fair ★★★☆☆
Parking Lots	$26.0M	10	75	Fair ★★★☆☆
Sidewalks, Walkways & Courtyards	$4.7M	14	50	Fair ★★★☆☆
RECREATION				
Sports Fields & Courts	$1.1M	24	25	Good ★★★★☆

Table 1: State of the Infrastructure (SOTI) – Summary of UTM's Linear Asset Portfolio

*Estimated Service Life

★★★½☆

Overall Condition
GOOD*

$126.8M
Total Replacement Value

*87% of UTM linear assets are in Fair to Very Good Condition

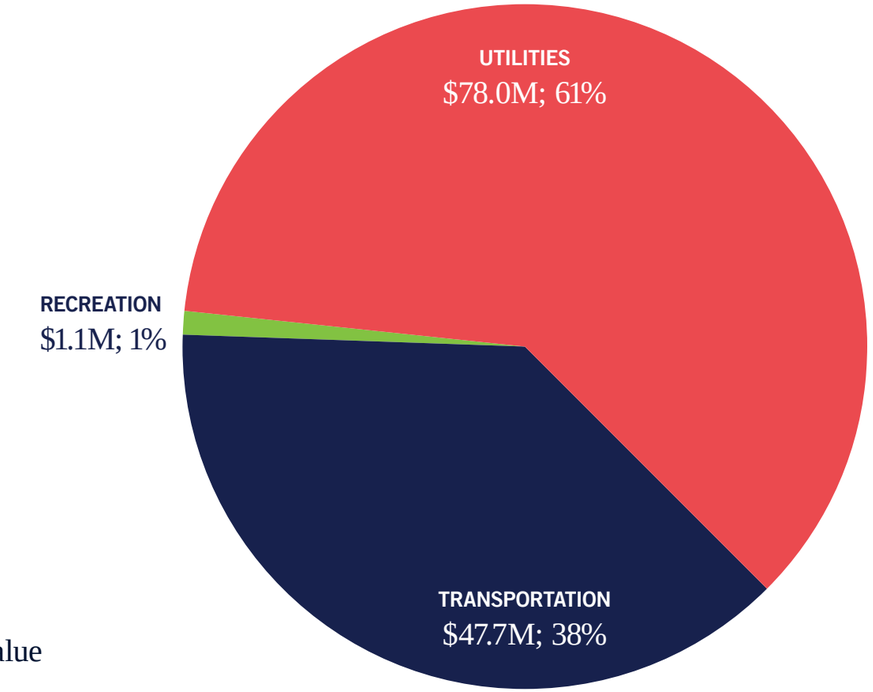


Figure 2: Asset Valuation by Service Area

2

STATE OF THE INFRASTRUCTURE (SOTI)

The plan provides an evaluation of the physical condition, age profile and expected service life of assets, primarily using:

- CCTV inspections (NASSCO PACP)
- Sidewalk condition surveys
- ASTM D6433-compliant road condition ratings
- Historical installation records

KEY FINDINGS

- Average weighted asset age: **~30 YEARS**
- Majority of infrastructure is in **GOOD** condition
- **STORM SEWERS** and **SIDEWALKS** present the most significant deterioration trends
- The asset backlog sits at **$14.7 MILLION** (2024)

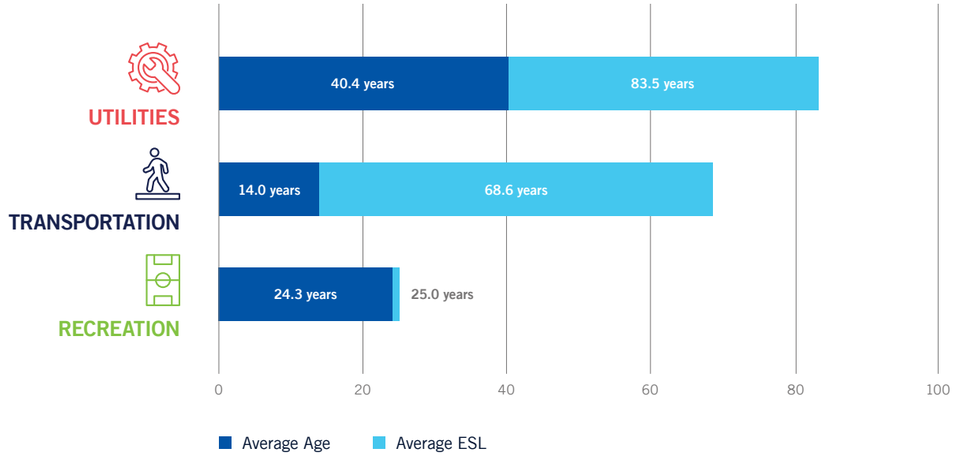
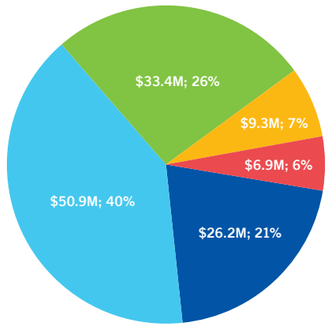


Figure 3: Asset Age and Remaining Life Profile



87%
in Fair to Very Good Condition

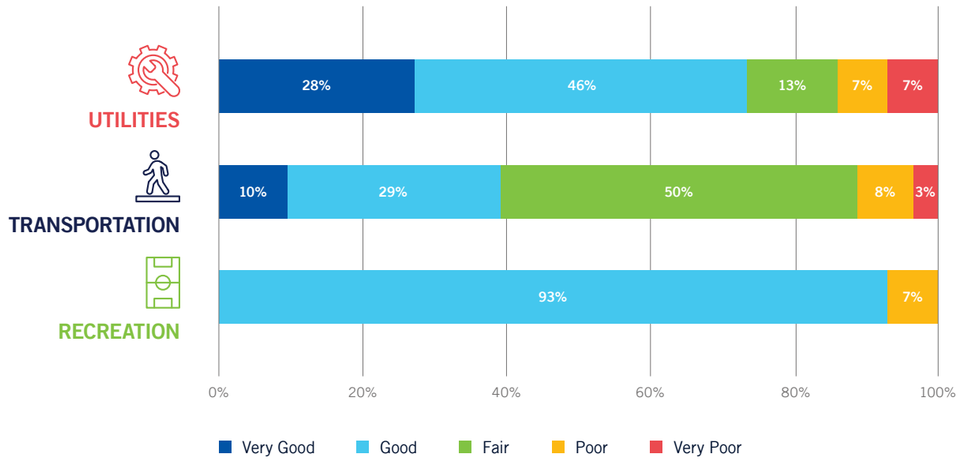


Figure 4: Percentage of Replacement Cost

3

LEVELS OF SERVICE (LOS)

UTM has adopted a two-tiered Levels of Service (LOS) framework:

CUSTOMER LOS

Captures user satisfaction, safety and accessibility

TECHNICAL LOS

Focuses on quantifiable performance metrics like surface defects, structural integrity and drainage capacity

This dual approach enables better transparency and helps align expectations across operational, regulatory and community partners.

RESPONDENTS' LEVEL OF SATISFACTION WITH ASSET CLASSES

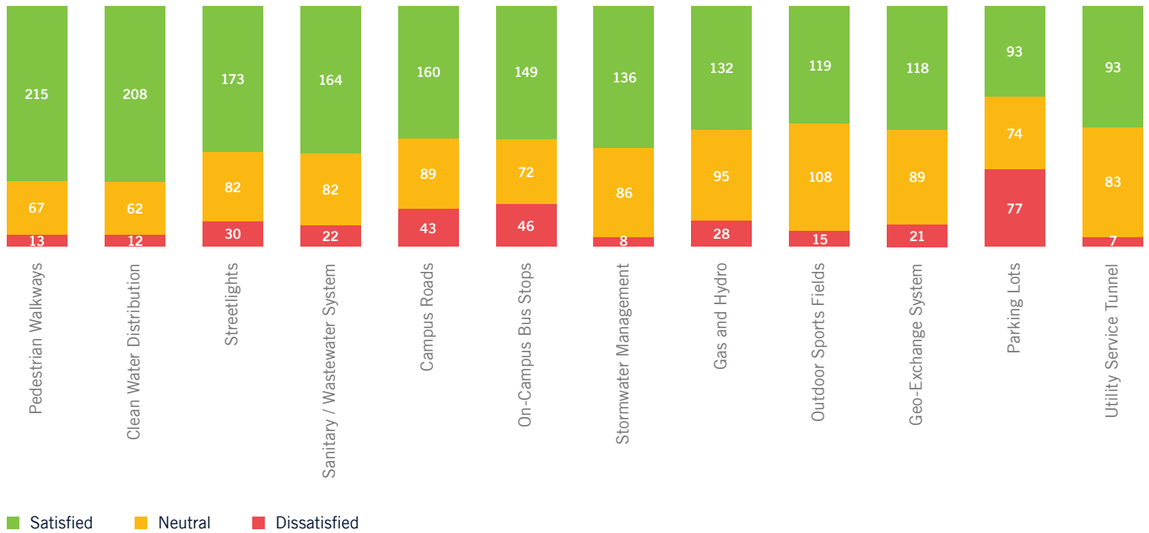


Figure 5: Customer LOS – Survey Results

SERVICE	ASSET CLASS	PERCENTAGE OF ASSETS IN FAIR OR BETTER CONDITION
Utilities	Watermains	100%
	Sanitary Sewers	83%
	Storm Sewers	69%
	Gas and Hydro	100%
Transportation	Parking Lots	88%
	Roads	100%
	Sidewalks, Walkways and Courtyards	65%
	Streetlights	98%
	On-Campus Bus Stops	100%
Recreation	Sports Fields/Courts	93%

Table 2: Technical LOS Summary – % Assets in Fair or Better Condition

4

LIFECYCLE MANAGEMENT STRATEGY

UTM's Lifecycle Strategy is the set of planned actions performed on assets to provide LOS in a sustainable way, while managing risk, at the lowest lifecycle cost. This section of the LAMP is composed of the following:

- Descriptions of the specific lifecycle activities applied to each asset.
- The forecasted lifecycle activity costs illustrating the capital needs across the entire asset lifecycle from creation to disposal. Note that these costs are provided in a separate section for each subservice, entitled "Funding the Lifecycle Activities".

Lifecycle activities are important as they work together to extend the asset life, reduce overall lifecycle costs and achieve other objectives, such as environmental goals and balancing risk. The asset lifecycle activities are detailed according to the categories provided in Table 3.

LIFECYCLE ACTIVITY CATEGORY	DESCRIPTION
Non-Infrastructure Solutions	• Actions or policies that can lower costs or extend asset life.
Operations and Maintenance	• Includes regularly scheduled inspection and maintenance or more significant maintenance.
Renewals (Rehabilitation/Replacement)	• Rehabilitation: significant repairs designed to extend the life of the asset. • Replacement: activities for the end of its useful life.
Disposal	• Activities associated with disposing of an asset once it has reached the end of its useful life.
Growth	• Planned activities required to extend services to previously un-serviced areas or expand services to meet growth demands.
Service Improvement	• Activities to improve or upgrade services to meet community needs and/or regulatory requirements, etc.

Table 3: Lifecycle Activity Categories and Descriptions

ITEM	DESCRIPTION	STATUS
LC-1	Continue collecting and updating asset condition data. Validate the lifecycle models with the condition data and modify the lifecycle models or develop new lifecycle models as necessary. Ensure that appropriate asset data is also collected and tied to the observed condition data, such as asset type, number of past asset interventions/rehabilitations, asset age, etc.	Ongoing
LC-2	Enhance the lifecycle models by shifting to a more data-driven approach by reviewing historical asset data and incorporating the findings into the lifecycle models, where feasible.	Future
LC-3	Continue recording and updating asset intervention costs digitally, and tie them to the asset hierarchy to increase the maturity of forecasting costs.	Ongoing

Table 4: Lifecycle Management Improvement Actions

5

FINANCIAL STRATEGY AND FORECAST

The financial model forecasts renewal needs over 10- and 25-year horizons. Findings include:

$71.5M
in renewal needs (2025–2050)

$28.9M
in near-term renewal (2025–2035)

$14.7M
in current asset backlog (2024)

Backlog = **14%** of total Current Replacement Value

Strategies are in development to stabilize annual investments and reduce long-term funding gaps. Key financial indicators like FCI (Facility Condition Index) and remaining service life were also analyzed to optimize reinvestment.

SUBSERVICE	CURRENT REPLACEMENT VALUE (2024)	CURRENT BACKLOG (2024)	BACKLOG AS % OF REPLACEMENT VALUE
Watermains	$13.2M	$0	0.0%
Sanitary Sewer	$12.2M	$2.1M	16.8%
Storm Sewer	$27.9M	$8.8M	31.6%
Road	$11.6M	$321.5k	2.8%
Streetlights	$5.3M	$105.0k	2.0%
Surface Parking Lot and Parking Decks	$26.0M	$1.1M	4.2%
Sidewalks and Walkways/Courtyards	$4.7M	$2.2M	46.3%
On-Campus Bus Stops	$77.9k	$0	0.0%
Sport Fields/Courts	$1.1M	$78.9k	7.3%
Gas Lines	$800.7k	$0	0.0%
Hydro	$9.8M	$0	0.0%
Geo-exchange System	$9.1M	$0	0.0%
Utility Service Tunnel	$4.9M	$0	0.0%
Total	**$126.8M**	**$14.7M**	**14%**

Table 5: Replacement Value and Backlog by Asset Class

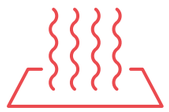
SUBSERVICE	10-YEAR TOTAL FORECASTED EXPENDITURES	10-YEAR AVERAGE ANNUAL COST (2026-2035)	25-YEAR TOTAL FORECASTED EXPENDITURES	25-YEAR AVERAGE ANNUAL COST (2026-2050)
Watermain	$1.2M	$120.7k	$3.0M	$120.7k
Sanitary Sewer	$2.9M	$285.4k	$4.1M	$164.8k
Storm Sewer	$13.4M	$1.3M	$22.0M	$878.1k
Road	$1.3M	$130.1k	$7.8M	$310.3k
Streetlights	$105.0k	$10.5k	$1.5M	$60.9k
Surface Parking Lot and Parking Decks	$4.0M	$400.0k	$20.9M	$835.5k
Sidewalks and Walkways/ Courtyards	$2.8M	$283.7k	$2.8M	$113.5k
On-Campus Bus Stops	$58.5k	$5.8k	$77.9k	$3.1k
Sport Fields/Courts	$78.9k	$7.9k	$1.1M	$43.4k
Gas Lines	$18.5k	$1.8k	$46.2k	$1.8k
Hydro	$2.9M	$291.8k	$7.3M	$291.8k
Utilities Service Tunnel	$130.0k	$13.0k	$910.0k	$36.4k
Total	**$28.9M**	**$2.9M**	**$71.5M**	**$2.9M**

Table 6: Projected Renewal Expenditures – 10 and 25 Years

6

CLIMATE CHANGE AND RISK MANAGEMENT

The LAMP integrates climate resiliency and sustainability principles. This includes:



SURFACE MATERIAL UPGRADES FOR HEAT AND STORM EVENTS

FLOOD RESILIENCE STRATEGIES

RISK-BASED DECISION MODELS FOR FUTURE LOS DEGRADATION

Adaptation planning complements UTM's Climate Positive Plan by targeting infrastructure with the highest environmental exposure.

ASSET	ACTION
Watermains	Reduce water leakage by performing maintenance and analysis on watermains regularly and repairing breaks/leaks as soon as possible to reduce the amount of water loss through leaks.
Stormwater	Continue implementing LIDs where feasible around campus that will reduce stormwater runoff volume and improve stormwater quality.
Stormwater	Perform stormwater pond bathymetric surveys to determine when dredging is required to maintain TSS removal efficiency.
Stormwater	When designing new facilities/infrastructure, ensure that percentage of site imperviousness is maintained at the target to reduce the effects of increased stormwater runoff i.e., post development run-off equal to or less than pre-development run-off.
Stormwater/ Sanitary	Any rehabilitation needs should consider trenchless technology to reduce GHG emissions generated (i.e., trenchless generates less than open cut renewal).
Parking Lots	Track electric vehicle charging spaces and stations usage to determine if more spaces and stations should be installed. Using the Master Plan/growth studies, determine how many more charging stations should be installed in the near to long-term.
Parking Decks	Equip all parking fixtures with LED lights to reduce energy consumption.
Streetlights	Equip all streetlights with LED lights to reduce energy consumption.
Gas and Hydro	Continue tracking gas and hydro usage to determine if UTM is on track to achieve gas and hydro consumption targets. New buildings/infrastructure — support the Master Plan by designing sustainable, high-quality buildings and spaces. These buildings should contribute to reducing GHGs, efficient energy distribution and reduced energy consumption.
Gas and Hydro	Continue tracking GHG emission reductions to determine if UTM is on track to achieve reduction targets.
Geo-exchange System	UTM has two GXS. The performance of the Instructional Centre was assessed in 2021. UTM should continue monitoring the performances of these systems to ensure they continue to be energy efficient. As the systems age, UTM will need to invest in them to perform asset interventions as necessary to return the performances to an acceptable level. This will ensure that the systems continue using less energy compared to a similar building.

Table 7: Improvement Plan Recommendations – Climate Change Initiatives

7

IMPROVEMENT PLAN AND FUTURE OUTLOOK

UTM's asset management maturity is evolving through these initiatives:

ASSET REGISTER OPTIMIZATION
Ongoing data clean-up and integration with GIS

LOS MONITORING DASHBOARDS
Visual performance tracking tools for public transparency

PRIORITIZATION ALGORITHM
Combines condition, risk, and service impact

Implementation of these measures will elevate UTM's strategic decision-making and support capital planning objectives.

ITEM	DESCRIPTION	STATUS
LOS-1	Track current performance of each performance measure annually and maintain records of past performances from previous years. This will allow UTM to analyze trends in performance levels.	Ongoing
LOS-2	Review and revise the LOS framework annually to ensure that the LOS framework is up to date and best reflects UTM's objectives and strategies. This includes reviewing the performance measures to ensure that existing performance measures still reflect UTM's decision-making processes, identifying new performance measures to add, and identifying what data is required to report on the current performance of these new performance measures.	Future (2026 and onwards)
LOS-3	Conduct a second round of community engagement to gather feedback on current service delivery/service levels and compare the results to the 2024 LOS survey results to determine if service levels have improved, decreased, or maintained. Gather feedback from the community on proposed LOS.	Future
LOS-4	Establish proposed levels of service, in line with O.Reg. 588/17 requirements. Use the community engagement feedback to inform proposed LOS.	Future

Table 8: LOS Improvement Recommendations

ITEM	DESCRIPTION	STATUS
FS-1	Review the 5-year deferred maintenance budget forecast and assign to a specific service area and asset class (tied to the asset hierarchy). Categorize each project by lifecycle activity. Determine the annual expenditures for each asset class and lifecycle activity.	Future
FS-2	Update the lifecycle forecasting analysis using the annual expenditures to determine if current anticipated funding is sufficient to provide appropriate service levels.	Future

Table 9: Financial Strategy – Action Items

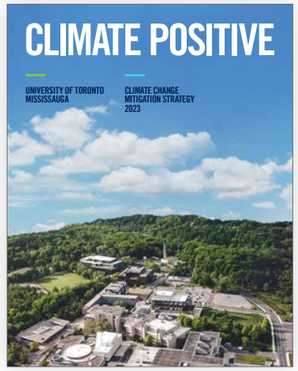
8

STRATEGIC ALIGNMENT AND GOVERNANCE

The LAMP is closely aligned with institutional and regulatory mandates:

UTM Strategic Framework

Campus Master Plan



Climate Positive Plan

O. Reg. 588/17 Requirements

Governance of the plan is led by the Asset Management Office within the Facilities Management & Planning (FM&P) department, with oversight responsibilities clearly distributed. Although universitites are exempt from complying with Ontario Regulation 588/17, it was used as a reference to best industry practice, ensuring continuous improvement and demonstrating operational excellence in asset management strategic planning.

9

CONCLUSION

The 2025 LAMP is a transformational document for UTM's infrastructure management approach. It provides:

A detailed asset roadmap

Financial foresight

Performance benchmarking

Risk-informed planning

As UTM continues to grow, this plan ensures the campus remains serviceable, climate-resilient and fiscally prepared to provide sustainable levels of services for many decades to come.

The completion of the Linear Asset Management Plan (LAMP) marks a significant milestone in UTM's journey toward building a resilient, responsive, and future-ready campus. This report is more than a record of assets — it is a strategic commitment to delivering infrastructure services that uphold UTM's academic mission, reflect our values and meet the expectations of a growing and dynamic campus community.

As we move forward, our focus will shift from planning to execution. The insights and recommendations captured in this plan will directly inform capital renewal priorities, maintenance schedules, and funding strategies over the next decade. We will continue to strengthen our governance structures, refine performance tracking systems and adopt digital tools that enhance visibility and decision-making.

UTM is also committed to embedding equity, climate resilience and sustainability into every infrastructure decision. This includes integrating the LAMP with broader institutional frameworks such as the Climate Positive Plan, the Campus Master Plan and operational resilience initiatives.

OUR NEXT STEPS INCLUDE:

- Annual updates to asset condition and performance data.
- Implementation of a digital LOS and risk dashboard.
- Prioritization of renewal projects using multi-criteria analysis.
- Engagement with partners to align service expectations with investment planning.
- Collaboration with academic and research leaders to explore new innovations in campus infrastructure.

UTM's path forward is one of alignment, action and accountability. With this plan in place, we are equipped not only to manage our assets — but to lead by example in the post-secondary sector, demonstrating how thoughtful asset stewardship can enable excellence, equity and innovation across campus life.

The comprehensive LAMP and technical appendices can be provided upon request.

UNIVERSITY OF
TORONTO
MISSISSAUGA

DEFY
GRAVITY