

Year of Change - UQ

Kevin O'Sullivan and Mick Serena

$(t)e=mc^{2017}$
eureka
revolutionary ideas



TEMC
celebrating **40**
1977-2017 years



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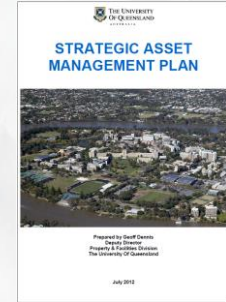
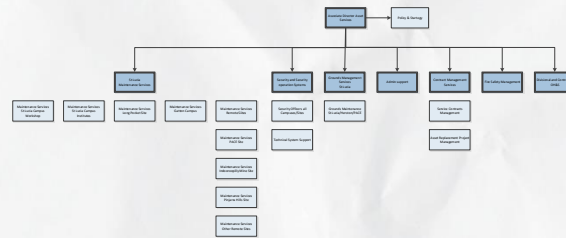
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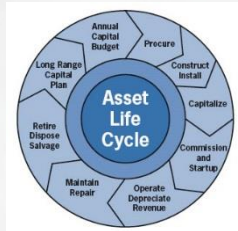
Process Improvements



Existing Structure – Direct Reports



Reviewing Contract Arrangements



Asset Life Cycle

Reviewing our Structure



System Improvements

Review of SAMP



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Are we on the right path



How do we know we are on the right path



What is it that we don't know

Holistic Asset Management



Project management Framework

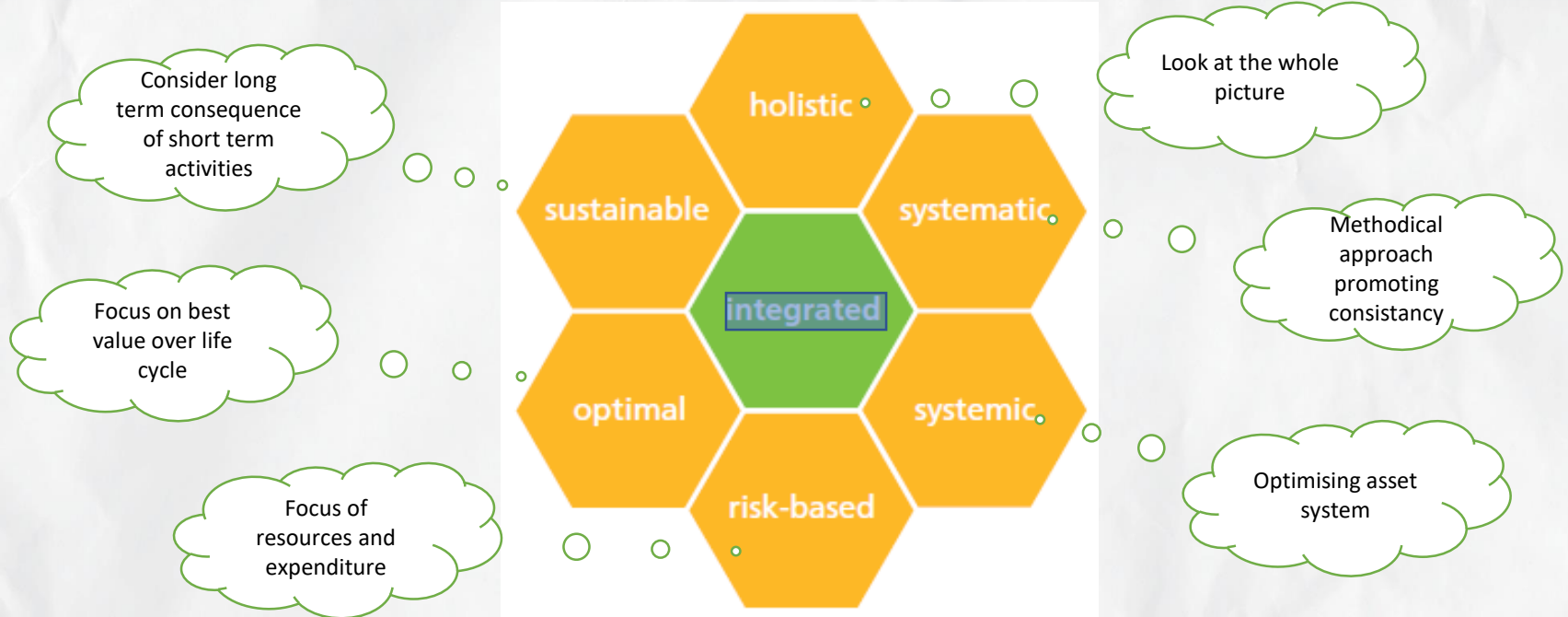


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Introduction to PAS 55

Key principles



Embarked on a review of our operation



1. We needed to understand our baseline of current maintenance practices
2. Needed to review our business model and strategies focusing on:
 - I. Maintenance strategy
 - II. Efficient use of resources
 - III. Estate condition
3. Needed to review the operational performance
4. Understand our ability to deliver effective maintenance services in a cost effective way

Reviews



1. PAS 55 Baseline Survey
2. Maintenance Management Framework (MMF) Review
3. Estate Performance Assessment (EPA)



University of Queensland



Campuses

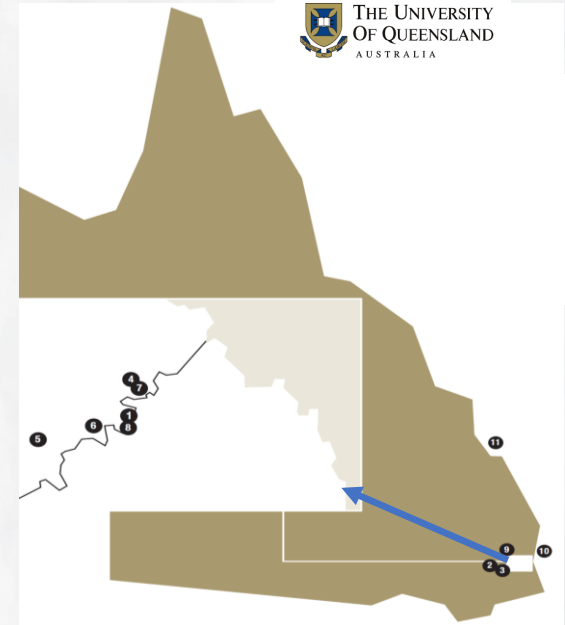
1. St Lucia campus
2. Gatton campus
3. Herston campus

20 Other Locations including:

- Pinjarra Hills
- Long Pocket
- University Mine, Indooroopilly
- School of Dentistry, City
- Pharmacy Australia Centre of Excellence, Woolloongabba
- Veterinary Teaching Clinic, Dayboro

Marine Research Stations

- Dunwich, Stradbroke Island
- Heron Island



University of Queensland



- Over 50,000 students
- 6703 staff
- 551 buildings
- 24% UFA Service & Equipment Intensive (SEI) buildings
- 782,216 m² (gross floor area)
- Asset Replacement Value of \$3.74 Billion
- 454 general teaching rooms and 1318 laboratories
- 1670 hectares



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Theory into Practice



- Each institution is unique.
- What outcomes does the institution want to achieve?
- While the IAM framework is universal, the solution needs to be bespoke.
- The key is to use the framework to enable the particular requirements of each institution.
- The best results are achieved through a collaborative and inclusive process that is based on empirical, not anecdotal, information.
- Measurement is critical. At the start, after each phase and ongoing.



Review of existing maintenance framework



- We needed to understand our baseline of current maintenance practices
- Need to review our business model and related strategies regarding the provision of maintenance activities focusing on:
 - Maintenance strategy
 - Estate condition
 - Efficient use of resources
- Need to review the operational performance of current maintenance delivery and the ongoing ability to deliver effective maintenance services in a cost effective way



Baseline Survey



- 106 participants
 - Management
 - Operational
 - Trade
- 59% completed
- 20% partial completion

Table 1: UQ Survey Status Summary

Status	Management	Operational	Trade	Total	Status Percentage
Complete	16	13	30	59	55.7%
Partial	8	6	7	21	19.8%
Not Started	3	9	14	26	24.5%
Total	27	28	51	106	100.0%
% Complete	59%	46%	59%		

The PAS 55 maturity benchmarks are as shown in Table 2 below:

Table 2: PAS 55 Maturity Levels

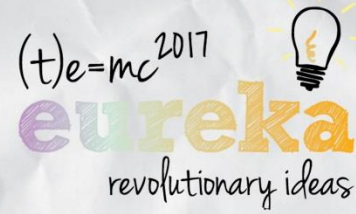
Average Assessment Score	Maturity Level	SAMF Adoption Maturity
0 to less than 1	0	The MMF elements required by PAS 55 are not in place.
1 to less than 2	1	The organisation has a basic understanding of the requirements of PAS 55 and is in the process of deciding how to adopt elements of PAS 55.
2 to less than 3	2	The organisation has a good understanding of PAS 55 and has a number of the elements of the SAMF framework in place.
3 to less than 4	3	All elements of PAS 55 are in place and are being applied and integrated. Only minor inconsistencies exist.
4	4	Using a MMF that goes beyond the requirements of PAS 55.



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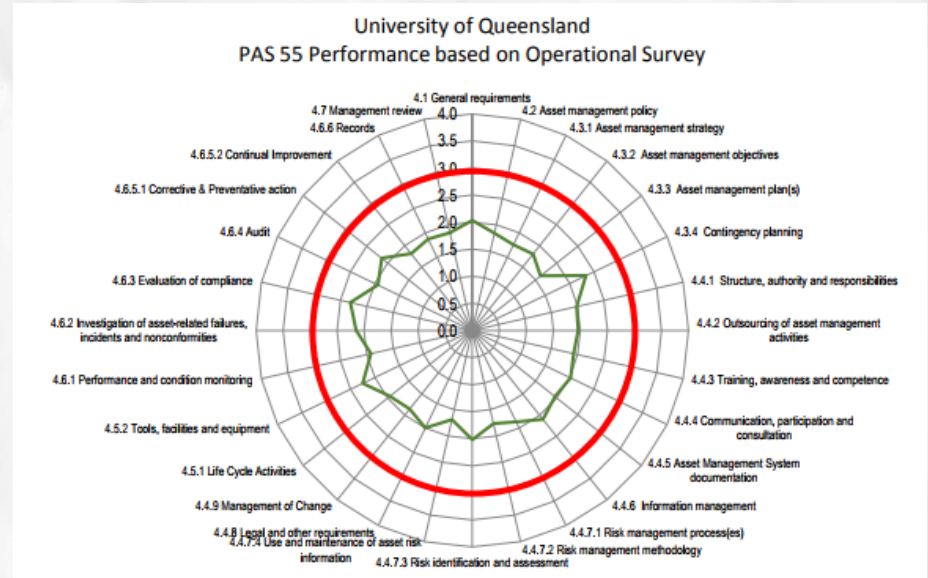


Baseline Survey



PAS 55 Baseline survey

- Management
- Operational
- Trade
- Total of 106 surveys
- 59% completion rate



Maintenance Management Framework



Governance

- Governance Overview
- Levels of Service

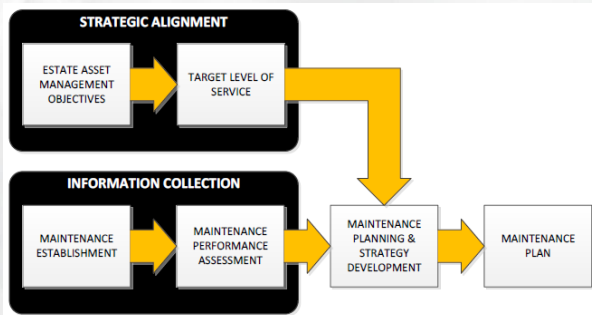
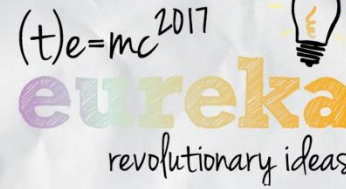


Figure 7: Maintenance Planning Process

Table 8: Standard Levels of Service

Level of Service	Level of Service Description	Level of Service
5	Critical Response	Maintain to a very high standard, minimising corrective maintenance.
4	Comprehensive Response	Undertake recommended maintenance regimes to all components of the building.
3	Managed Response	Carry out maintenance based on risk assessment. Limited planned maintenance.
2	Reactive Response	Defer non-essential maintenance where possible.
1	Secure Response	Carry out only essential "health & safety" maintenance.
S	Special Response	Where some element of the building requires a specific maintenance response that is not reflected in the standard levels of service (for example, the finishes is an animal holding facilities do not need to be of high standard but the services are critical).

Maintenance Management Framework



Asset management Plans

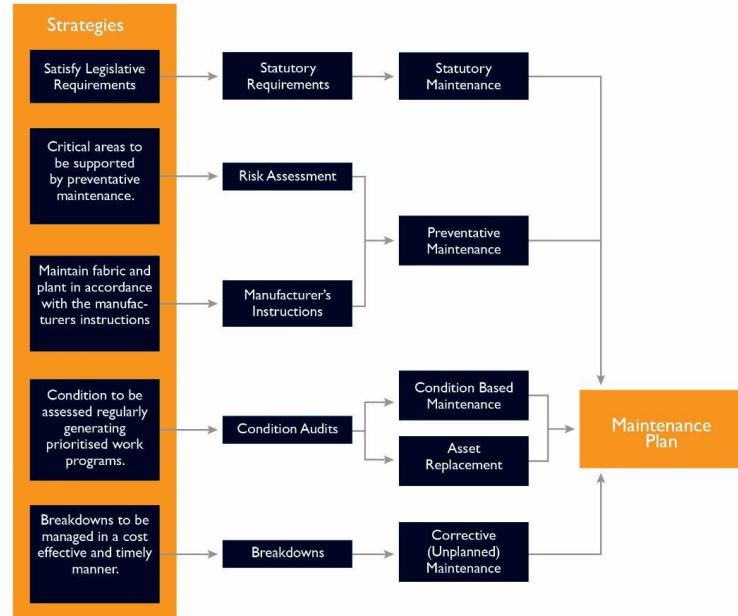
- Technical strategy;
- Risk management strategy;
- Financial management strategy;
- Procurement strategy; and
- Management strategy.

Maintenance Strategy Development and Maintenance Planning

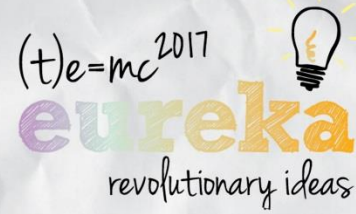
Maintenance Service Delivery Strategy

Maintenance Operations Plans

Preventative vs Corrective Maintenance



Maintenance Management Framework



Enablers & Controls

- Core processes
- Procurement approaches
- Communications
- Information management
- Risk management

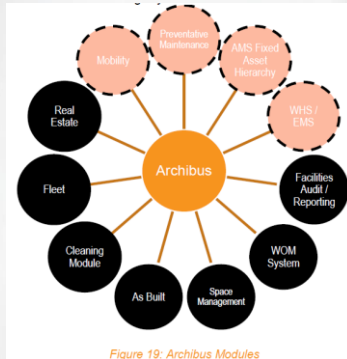
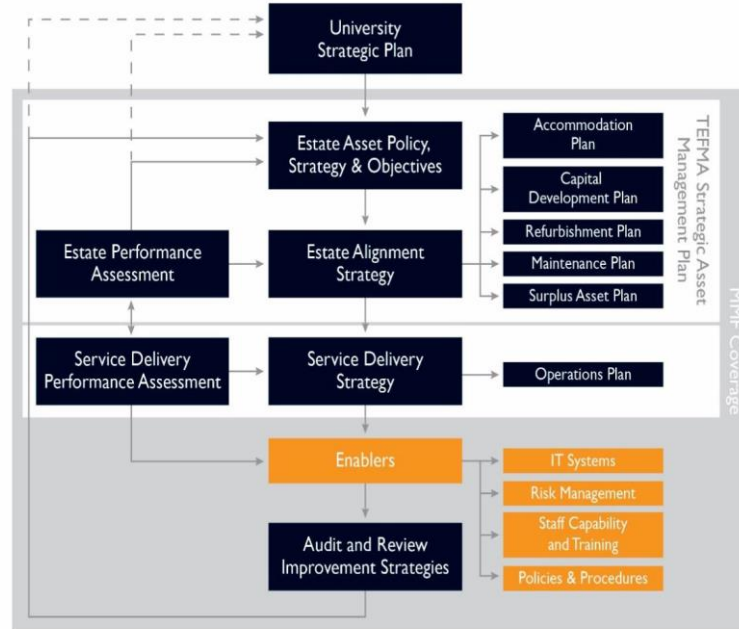
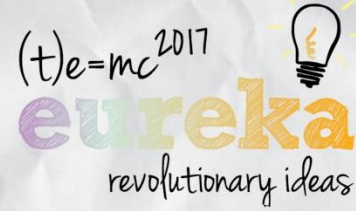


Figure 19: Archibus Modules

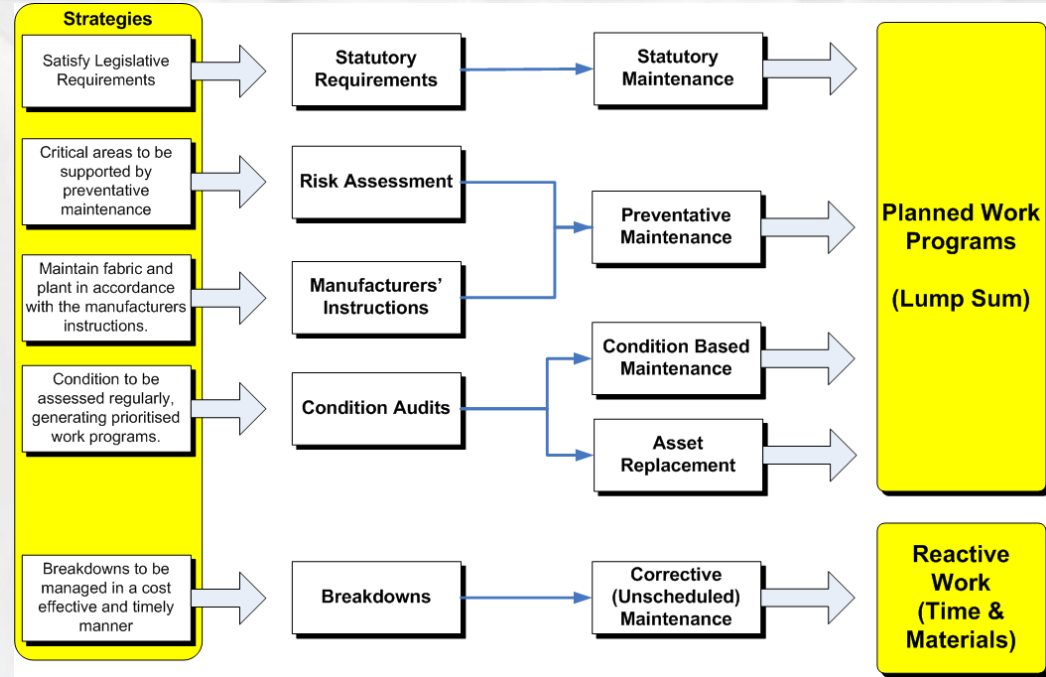


Maintenance Management Framework



Asset Implementation Plans

- Develop a program for data collection. It is recommended that the focus is on building elements, given the gap between the required and allocated budgets;
- Develop a component hierarchy with standard component descriptions;
- Determine the maintenance task appropriate for each component, grouping the tasks into maintenance categories; and
- Apply the maintenance tasks as per the defined level of service.



Maintenance Management Framework



Performance Assessment

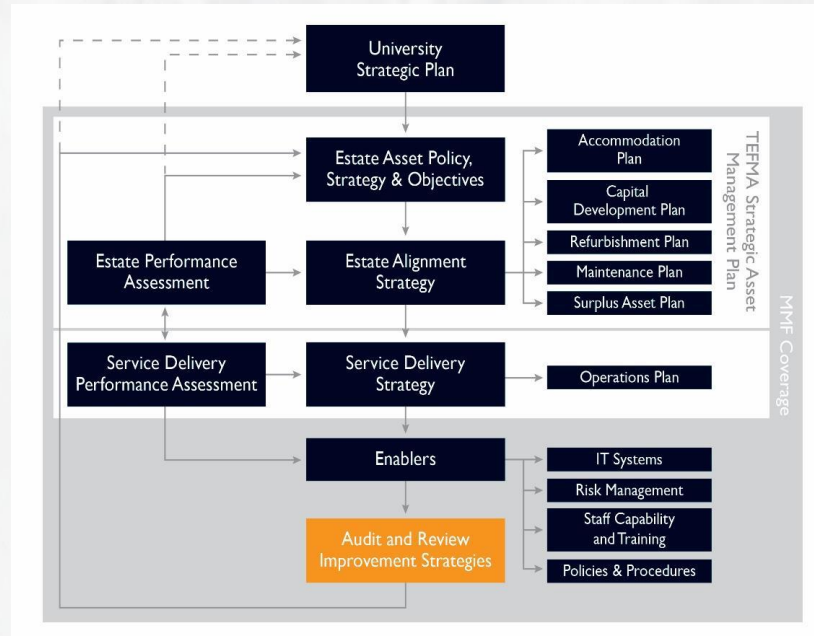
- Performance assessment overview
- Service delivery maintenance KPI's
- Estate performance
- Maintenance service delivery performance
- Estate maintenance performance KPI's

Maintenance & Recapitalisation		Backlog KPIs	Output KPIs	Input KPIs	
Recapitalisation	Statutory Refurbishment	Backing Statutory	Facility Functionality Index (FFI)	Refurbishment & Modernisation Index (RI)	Function
		Backlog Access			
	Non-Statutory Refurbishment	Backlog Refurb			
		Backlog Other			
Maintenance	Asset Replacement	Backlog Asset Replacement	Facility Condition Index (FCI)	Asset Replacement Index (ARI)	Condition
	Maintenance Expenditure	Backlog Maintenance		Maintenance Index (MI)	
			Facilities Needs Index (FNI)		

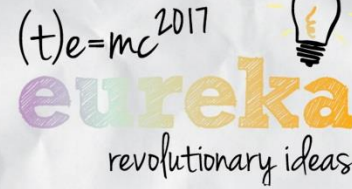
Maintenance Management Framework



Maintenance Review & Reporting

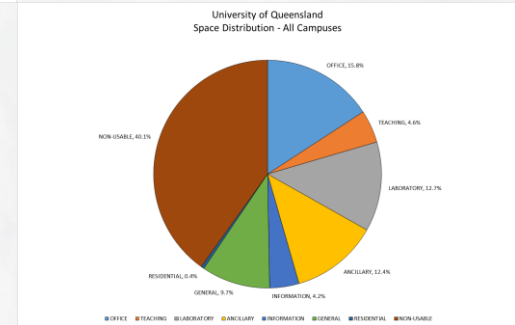
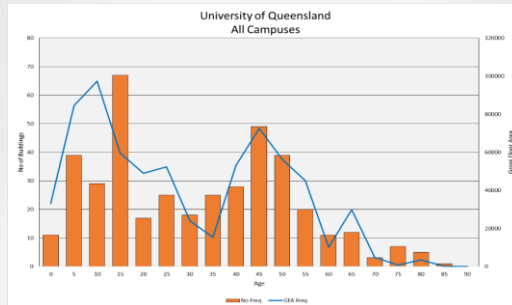
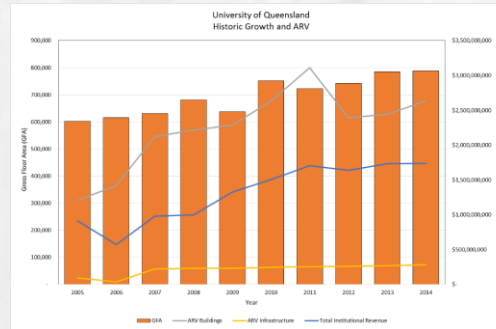


Estate Performance Assessment

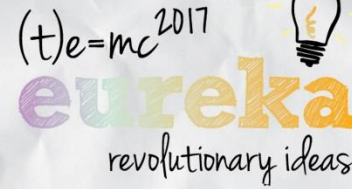


Current Estate

- Historic growth
- Age of estate
- Utilisation



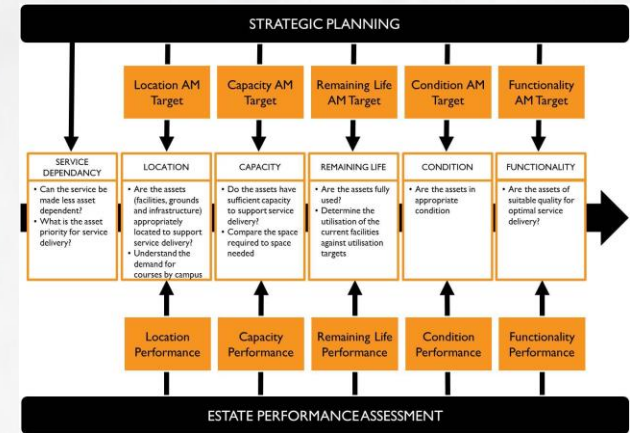
Estate Performance Assessment



Performance Assessment

Gap analysis

AM Goals	Performance Indicator	Performance Measures
Estate Space	Capacity	Capacity Index
	Utilisation	% Utilisation
	Location	Location Rating
Quality	Condition	Overall Condition Rating (OCR) Facility Condition Index (FCI)
	Functionality	Overall Functionality Rating (OFR) Facility Functionality Index (FFI)
	Remaining Life	Estimated remaining building life
Compliance	Extent of Non-Compliance	Building Compliance Rating
Environmental Sustainability	Environmental Performance	GHG Consumption, Energy (Gj/m ²), Water (kl/m ²), Waste (recycled, landfill)
Financial Sustainability	Operating Cost	Utilities, cleaning, security etc (\$/m ² , %ARV)
	Maintenance Cost	Corrective, Planned, Condition-Based, Asset Replacement (%ARV)
	Deferred Maintenance Cost	Maintenance Backlog
Asset Importance	Importance of Assets to University Priorities	Asset Priority Index



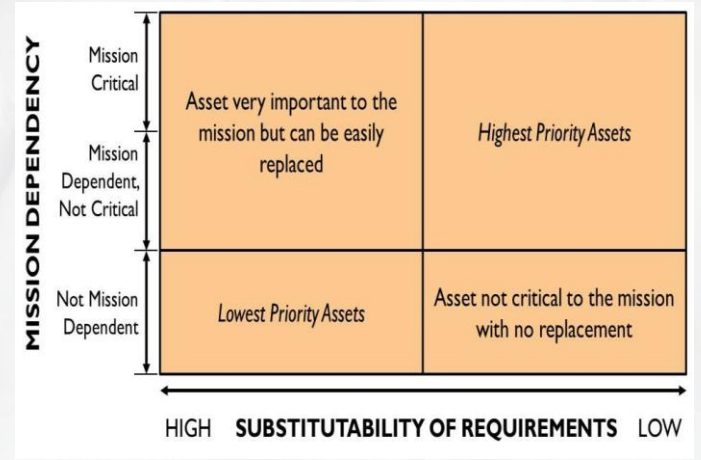
Estate Performance Assessment



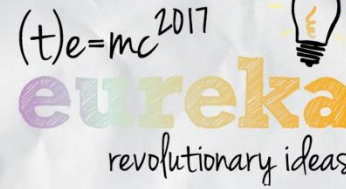
Asset Priority Index (API)

Table 8 API Category Rating and Descriptions

Category	Rating	Description
Strategic Alignment (SA)	5 to 1	Score 5 if the functions within the building is critical to the university, given the strong alignment of the asset with the university's strategic plan. Score 1 if the functions within the building is not critical to the university or if there is no alignment of the asset with the university's strategic plan.
Consequence (C)	5 to 1	Score 5 if there are strong implications for service delivery if the asset is not provided. Score 1 if there is minimal implications for service delivery if the asset is withdrawn from service
Intra dependency (IAD)	5 to 1	Score 5 if the required functions CANNOT be delivered out of alternative facilities on campus or through temporary facilities. Score 1 if the required functions CAN EASILY be delivered out of alternative facilities on campus or through temporary facilities
Inter dependency (IED)	5 to 1	Score 5 of the activity CANNOT be delivered in another way. Score 1 if the activity CAN be delivered in another way, including using non asset solutions



Estate Performance Assessment

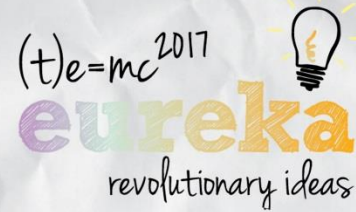


Levels of Service (LoS)

Table 16: Definition of Assets Levels of Service and associated Condition Standards

Levels of Service	Assets Levels of Service	Condition Standard of the Assets
5	Showpiece High profile building or amenity for distinctive University or public use; or highly sensitive infrastructure providing essential or dependent services. eg. Great Hall, Chancellery, central plant room, major electrical substation	Asset to be in best possible condition. Only minimal deterioration will be tolerated.
4	Comprehensive Business operations requiring good public presentation and high quality working environments (lecture theatres, library facilities, office and residential accommodation)	Asset to be in good condition operationally and aesthetically, benchmarked against industry standards for that particular class of asset.
3	Managed Functionally focused asset at utility level (e.g. tutorials, laboratories, workshops, plant rooms.)	Asset to be in reasonable condition, fully meeting operational requirements.
2	Reactive Functions are ancillary only, with no critical operational role (e.g. storage), or asset has limited life.	Conditions need to meet minimum operational requirements only.
1	Crisis Functions have ceased and asset is dormant pending disposal, demolition, major refurbishment, etc.	Conditions can be allowed to deteriorate and are only marginally maintained to meet minimum statutory requirements only

Estate Performance Assessment



Capacity Assessment

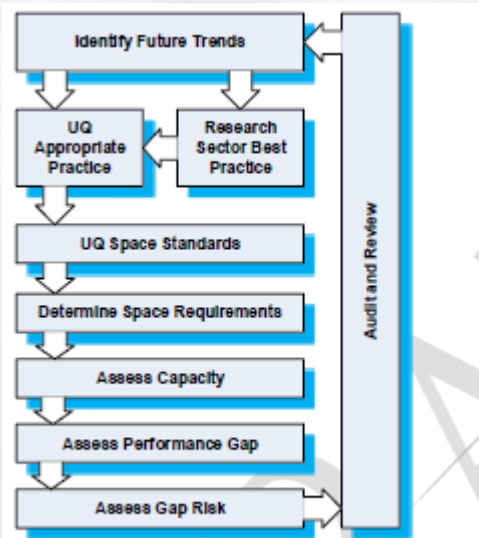


Figure 10: Capacity Assessment and Review Process

Table 24: Capacity Index Standard

Capacity Index Range	Capacity Rating	Comment
0 to 0.85	1.0	Very Poor: Space not fit for purpose. Insufficient space.
0.85 to 1.0	3.0	Fair: Less than target but still fit for purpose
1.0 to 1.1	5.0	Excellent: Optimal performance
1.1 to 1.2	4.0	Good: Slightly inefficient as it reflects up to a 20% oversupply
1.2 to 1.5	3.0	Fair: Inefficient use of space
1.5 to 2.0	2.0	Poor: Significantly inefficient use of space
2.0 +	1.0	Very Poor: Grossly inefficient use of space.

Estate Performance Assessment



Utilisation Assessment

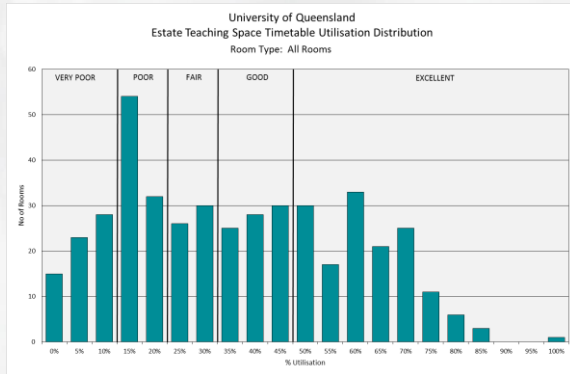


Table 49: TEFMA Utilisation Performance Standards

Room Type	TEFMA Occupancy Target	TEFMA Frequency Target	TEFMA Utilisation Target
Seminar room	75%	75%	56%
Advanced Teaching	50%	75%	56%
Library / Informal	75%	75%	56%
Lecture theatre	75%	75%	56%
Special teaching room	75%	75%	56%
Studio	75%	75%	56%
Computer lab	75%	75%	56%
General	75%	75%	56%
Lab	50%	75%	38%
PBL	75%	75%	56%

Estate Performance Assessment



Condition Assessment

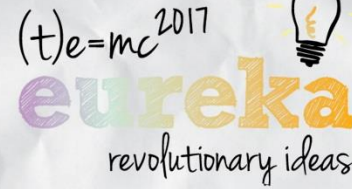
Table 52: TEFMA Condition Rating Standards

Condition Performance Standard	Condition Standard	Target Rating
Excellent	Asset has no defects; condition and appearance are as new.	5
Good	Asset exhibits superficial wear and tear, minor defects, minor signs of deterioration to surface finishes; does not require major maintenance; no major defects exist.	4
Fair	Asset is in average condition; deteriorated surfaces require attention; services are functional, but require attention; backlog maintenance work exists.	3
Poor	Asset has deteriorated badly; serious structural problems; general appearance is poor with eroded protective coatings; elements are defective, services are frequently failing; and a significant number of major defects exist.	2
Very Poor	Asset has failed; is not operational and is unfit for occupancy or normal use.	1

Table 53: Condition KPI Performance Benchmarks

TEFMA Status	Overall Condition Rating (OCR) Range	Facility Condition Index (FCI) Range	Star Rating
Excellent	4.0 to 5.0	0.97 to 1.00	★★★★★
Good	3.0 to 4.0	0.90 to 0.97	★★★★
Fair	2.5 to 3.0	0.85 to 0.90	★★★
Poor	2.0 to 2.5	0.80 to 0.85	★★
Very Poor	1.0 to 2.0	Less than 80	★

Estate Performance Assessment



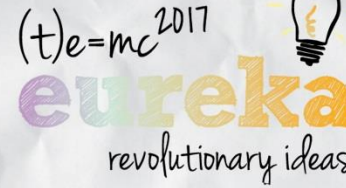
Functionality Assessment

Table 60: Functionality Assessment Criteria

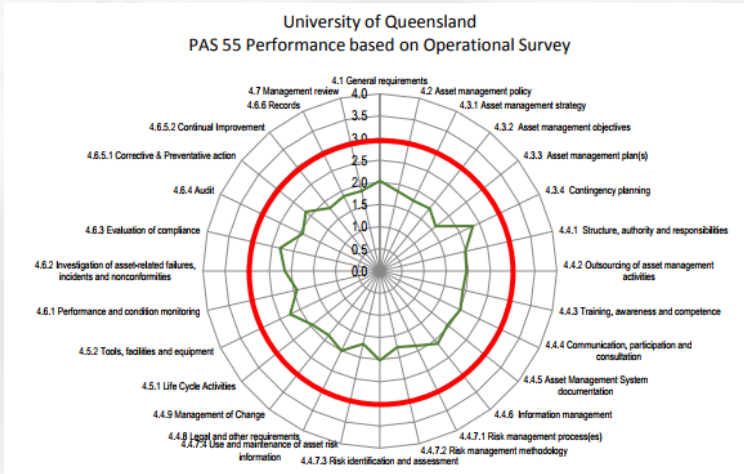
Aspects	Aspect Weightings	Topics	Topic Weightings
1. Spatial Relationships	35%	1.1 Scale/Layout (S)	40%
		1.2 Location (L)	20%
		1.3 Flexibility (F)	30%
		1.4 Utilisation (U)	10%
2. Environmental Comfort	10%	2.1 Heating in Winter (Th)	20%
		2.2 Cooling in Summer (TC)	20%
		2.3 Ventilation (TV)	15%
		2.4 Air Quality (TQ)	15%
		2.5 Acoustics (TA)	15%
		2.6 Lighting (TL)	15%
3. Provision / Amenity	25%	3.1 Safety & Security (PS)	15%
		3.2 Power (PP)	15%
		3.3 Data (PD)	15%
		3.4 Appliances (PA)	15%
		3.5 Furniture (PF)	15%
		3.6 Fitout (PO)	25%
4. Legislative Compliance	15%	4.1 Disabled Access (DA)	20%
		4.2 Fire (F)	20%
		4.3 Egress & Access (Stairs) (E&A)	15%
		4.4 Seismic (S)	10%
		4.5 Asbestos (A)	20%
		4.6 Lead (L)	10%
5. Adaptability	10%	4.7 Other (O)	5%
		5.1 Heritage (AH)	10%
		5.2 Floor to Ceiling (3.6m Slab to Slab) (AS)	15%
		5.3 Riser Location and Capacity (AR)	10%
		5.4 Columns Grid Layout (AC)	15%
		5.5 Building Shape (ASH)	10%
		5.6 Internal Structure (AI)	10%
		5.7 Egress and Access (AE)	10%
		5.8 Lifts (AL)	10%
		5.9 Availability of Plant Space (AP)	10%
6. Aesthetics	5%	6.1 Character and Innovation (CI)	25%
		6.2 Form & Materials (FM)	25%
		6.3 Internal Environment (IE)	25%
		6.4 Urban & Social Integration (UI)	25%

Outcome of Baseline Survey

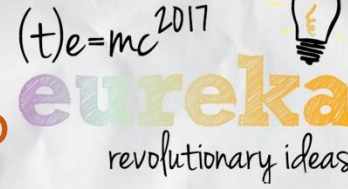
Need for Change



Provided robust supporting information to articulate a need for change



Outcome of MMF & EPA Framework to support SAMP



- Provided robust information to develop a new SAMP
- Now are using Pas 55 as a centrepiece of our maintenance framework
- Provided clear asset management objectives
- Enable executive buy-in to support the SAMP

A. EXECUTIVE SUMMARY	
Strategic Overview	<p>Option 1</p> <ul style="list-style-type: none"> Projects required to achieve a growth of 4% p.a. Current proposed program achieves that objective. High risk asset replacement. Asset replacement budget allocation is not sufficient to fund the required building works. Continuous current maintenance, operations, capital works, and asset replacement expenditures. Projects required to achieve a growth of 4% p.a. High risk asset replacements included in 10 year program from 2015 to 2020. 5 year periodical assessment and renewals for buildings below Quality Rating 3.0. Target maintenance, operations, capital works, and asset replacement expenditures capped at 6.5% based on historic expenditures.
Options Analysis	<p>Option 2</p> <ul style="list-style-type: none"> Projects required to achieve a growth of 4% p.a. Current proposed program achieves that objective. High risk asset replacement. Asset replacement budget allocation is not sufficient to fund the required building works. Continuous current maintenance, operations, capital works, and asset replacement expenditures. Projects required to achieve a growth of 4% p.a. High risk asset replacements included in 10 year program from 2015 to 2020. 5 year periodical assessment and renewals for buildings below Quality Rating 3.0. Target maintenance, operations, capital works, and asset replacement expenditures capped at 6.5% based on historic expenditures.
Option 3	<p>Option 3</p> <ul style="list-style-type: none"> Spice consolidation of 4% GFA by 2020. High risk asset replacements included in 10 year program from 2015 to 2020. Demolition/rebuildments taken from Option 1 of the International Study. Study requires refurbishment of existing spaces to enable relocations. 5 year periodical assessment and renewals for buildings below Quality Rating 3.0. Target maintenance, operations, capital works, and asset replacement expenditures capped at 6.5% based on historic expenditures.
Option 1	<p>Option 1</p> <ul style="list-style-type: none"> Spice consolidation of 4% GFA. High risk asset replacements included in 10 year program from 2015 to 2020. Demolition/rebuildments taken from Option 2 of the International Study. Study requires refurbishment of existing spaces to enable relocations. 5 year periodical assessment and renewals for buildings below Quality Rating 3.0. Target maintenance, operations, capital works, and asset replacement expenditures capped at 6.5% based on historic expenditures.
Financial Sustainability – All Options	<p>Option 1</p> <p>Option 2</p> <p>Option 3</p>
Outcomes	<p>Option 1 is also considered the optimal strategy for Campus A. This is the case because it:</p> <ul style="list-style-type: none"> achieves all estate performance targets and even exceeds the targets in some areas; is financially sustainable; and represents best value for money when balancing cost with quality (building) and condition (infrastructure) targets.

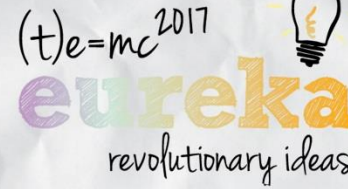
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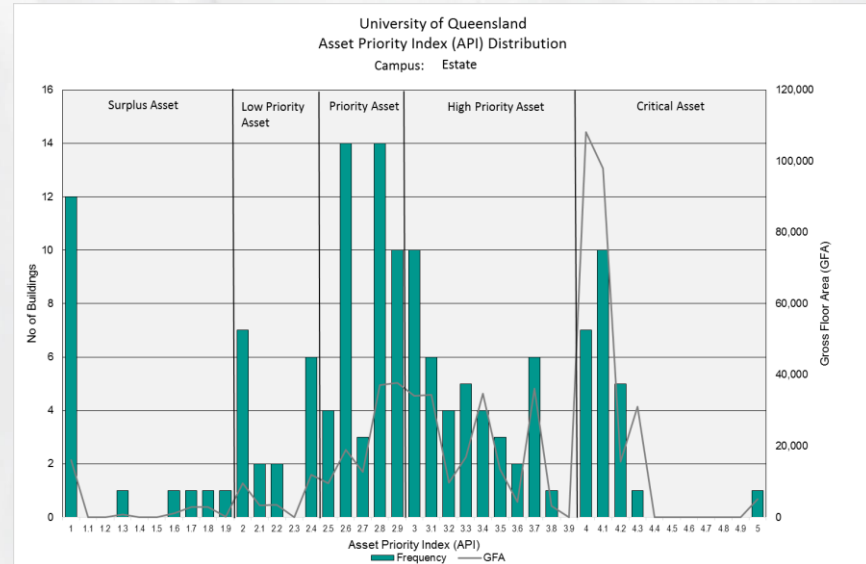
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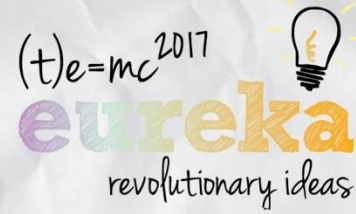
Outcome of MMF & EPA Asset Management Plans



- Developed an Importance rating to each building
- Established differentiated levels of services
- Identified surplus assets

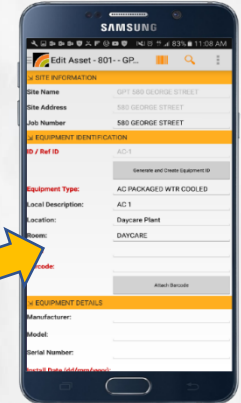
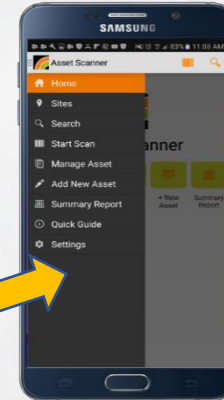
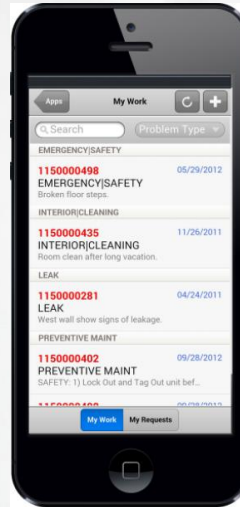


Outcome of MMF & EPA Enablers & Controls



- Improving work order management through mobile devices
- Implementing the preventative maintenance module of Archibus to demonstrate compliance to the component level
- Implementing asset to reference asset components of each work order

Air-conditioning contractor work order management



Outcome of MMF & EPA

Enablers & Controls

(t)e=mc²⁰¹⁷
eureka
revolutionary ideas

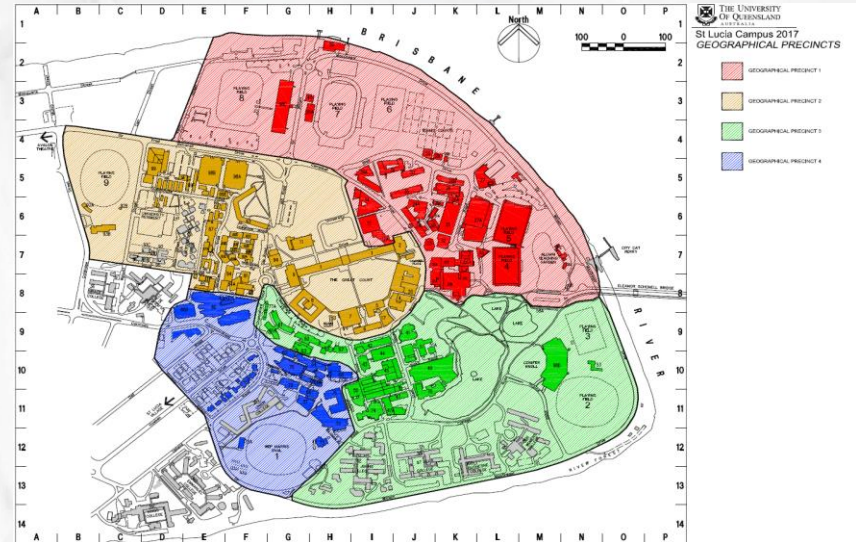


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celebrating 40
1977-2017 years

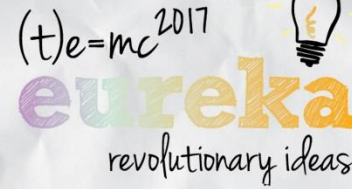
- Establishing maintenance delivery in Precincts
- Moving staff into client building
- Moving to Multi-skilled workforce
- Implementing performance based contracts



St Lucia Precinct Model

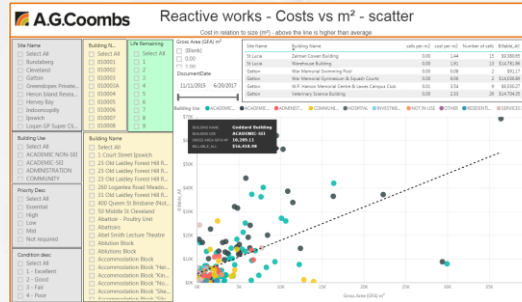


Outcome of MMF & EPA Enablers & Controls

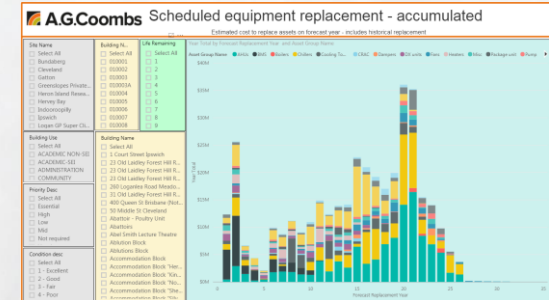


Costs per square metre

- Improving our data collection
- Developed life cycle replacement program for HVAC
- Replacement program incorporating
 - Life cycle
 - Priority
 - Condition
 - CM costs to the square metre
 - Amount of work order to the square metre



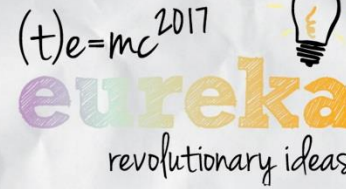
HVAC Life Cycle program



#TEMC_2017

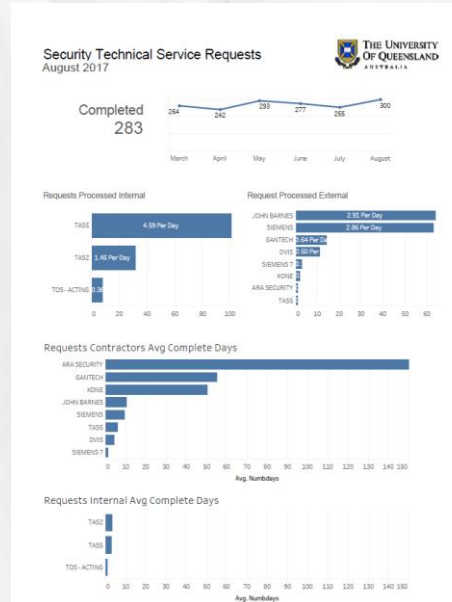


Outcome of MMF & EPA Performance Assessment



- Service delivery performance for in-house staff and Contractors
 - Completion times
 - Re-work
 - Outstanding work
 - Close outs
 - Trends

In-house staff



Contractors



Outcome of MMF & EPA Financial Sustainability



- Clear picture of our current funding levels
 - Corrective maintenance
 - Planned Maintenance
 - Condition based maintenance
 - Asset replacement
- Good understand our targeted service level based on asset priority
- Funding levels required to maintain the estate in a good condition

MI Summary (50 year average)					
Maintenance Type	Maintenance Index (% ARV)	Mission		Current	
		Mission Critical*	Non-Critical	Target Level of Service	Level of Service
Corrective Maintenance	0.23%	0.23%	0.00%	0.24%	0.28%
Planned Maintenance	0.34%	0.23%	0.11%	0.34%	0.29%
Condition Based Maintenance	0.44%	0.24%	0.20%	0.40%	0.24%
Maintenance Sub-Total	1.02%	0.70%	0.31%	1.02%	0.81%
Asset Replacement	0.89%	0.59%	0.30%	0.82%	0.18%
Total	1.91%	1.29%	0.61%	1.84%	0.99%

Comprehensive					
Showpiece	Whitestone	Managed	Reactive	Crisis	
0.19%	0.23%	0.28%	0.32%	0.37%	
0.38%	0.34%	0.33%	0.23%	0.10%	
0.49%	0.44%	0.33%	0.24%	0.00%	
1.05%	1.02%	0.95%	0.80%	0.47%	
1.07%	0.89%	0.68%	0.59%	0.00%	
2.12%	1.91%	1.63%	1.39%	0.47%	



Executive Support

Financial Sustainability

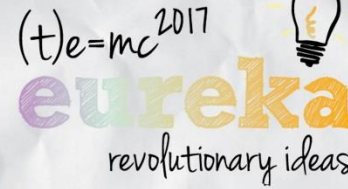


Approach to increased funding

- Submitted a paper to the COO
- Identified many years of increase GFA
- Robust assessment of the estate and the backlog maintenance
- Ageing nature of the estate
- Identified the funding according to LoS identified
- Referenced industry benchmarks
- Identified funding gap between existing funding and best practice
- Proposed a maintenance strategy of 1.5% ARV
- Recommended a gradual increase over 4 years



Executive Support Financial Sustainability



- Increased asset replacement allocation of \$10m 2017
- Commitment for extra \$10m/year until 2020
- Increased PM allocation of \$1.9m 2017
- Commitment of extra \$1.9m/year until 2020
- Now on a 3 year program of bring the estate to an acceptable condition
- Robust framework aligned with best practices

Increased funding



Learnings



Baseline Survey

- Included staff, management & key clients
- Should have included more clients

Estate Performance Assessment

- 144 buildings over 750sqm
- 88% of GFA
- Should have undertaken assessment on all of estate





The journey has provided UQ with comprehensive and defensible information for process improvements

However the skill is not about knowing the framework or models

It's about knowing how to use these to meet the requirements of each organisation.

a collaborative approach





Questions