Digital Twin Asset Investment Planning

Improving Building Asset Management– Allocating Funds for Capital and Maintenance Projects

Presented by Ashay Prabhu on behalf of GECC

Collaboration, Respect, Service Excellence, Integrity, Innovation

City of GLEN EIRA

GLEN EIRA CITY COUNCIL

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CARNEGIE • CAULFIELD • ELSTERNWICK
GARDENVALE • GLEN HUNTLY • MCKINNON
MURRUMBEENA • ORMOND • ST KILDA EAST

The Problem We Are Attempting to Solve?

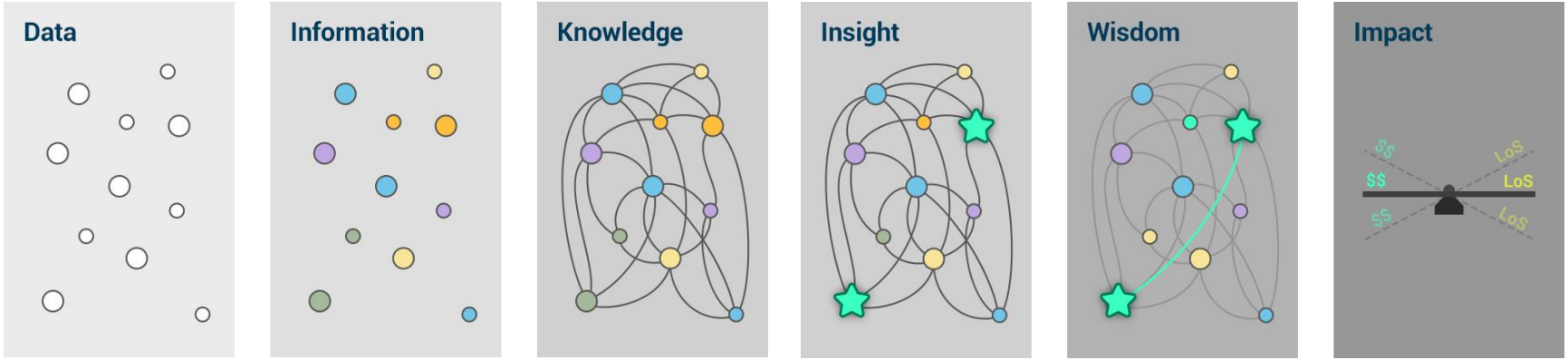
- Solving the intergenerational problem of renewal gap by optimising funding allocation

- Shifting from an asset-centric view to a service-centric view to deliver appropriate service levels at lower costs

"We've found that we can balance the cart before the horse with two carts behind the horse."

The True Service Level Financial Planning

Data-Wisdom – Pendulum Shift



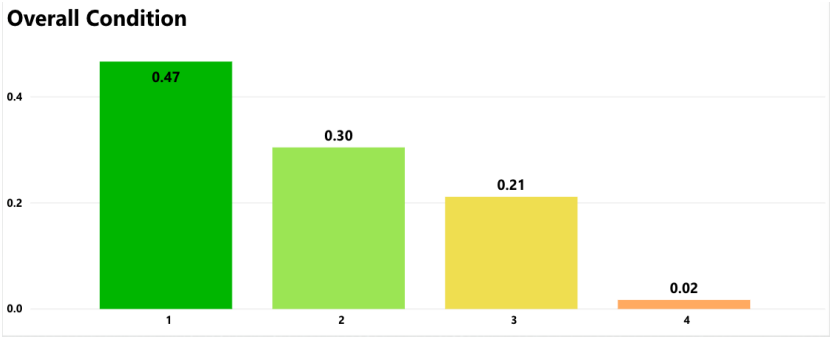
Background Snapshot

Our Portfolio Value: $250M+ buildings and facilities portfolio.

Consumption = Circa 4M per annum.

Funding: Constrained Budgets – Need to do more with less.

Regulation: Victorian Government Asset Management Accountability Framework and VAGO.



The Good Levers: Service level optimisation to cut asset consumption, introducing predictive analytics into decision-making to forecast funding allocation.

Outcome: GECC is now in a position to reduce the future funding gap while simultaneously improving facility performance, investing savings into alternative facilities and services without reducing current levels.

Choices and Options- AIP based on LoS

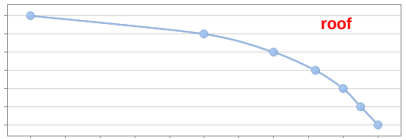
Raise Taxes	• Unpopular • Limited scope
Borrow Funds	• Finite capacity • Unsustainable
Reduce Services	• Unpopular • Unsustainable • Finite scope

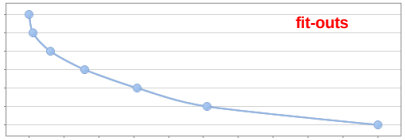
Extend the life of existing assets by optimising future spend

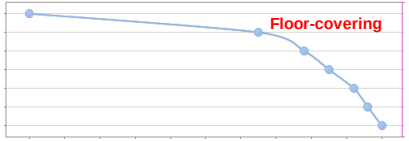
- Sustainably “do more with less”
- Increase performance, not investment
- Unlock hidden capital to fund the future

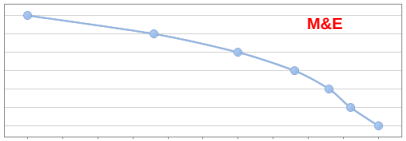
Thought leaders will optimise the performance of existing assets

DNA OF Digital Twin – For AIP Based Planning







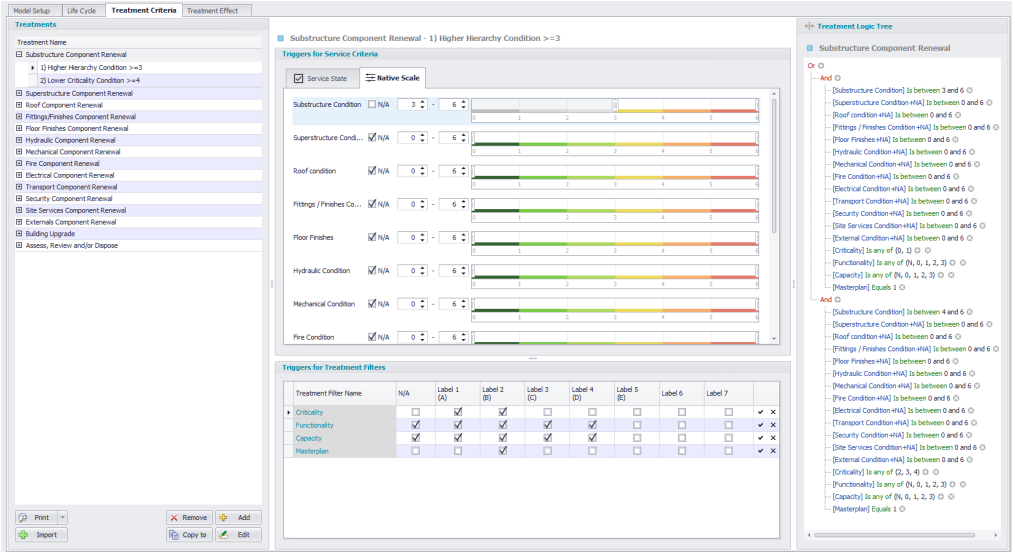


1. Digital Twin Component Attribution:
2. Performance Assessment Framework:
    - Condition
    - Capacity
    - Function

1. Criticality Framework

2. Degradation Patterns and Life Cycle Genetics

3. Decision Tree



Digital Twin Analytics- Multiple Future Choices

Simulation
- Option 1 - Current Funding
- Option 2 - Optimised Budget
- Option 3 - Zero Capital Budget
- Option 4 - 25% Budget Reduction

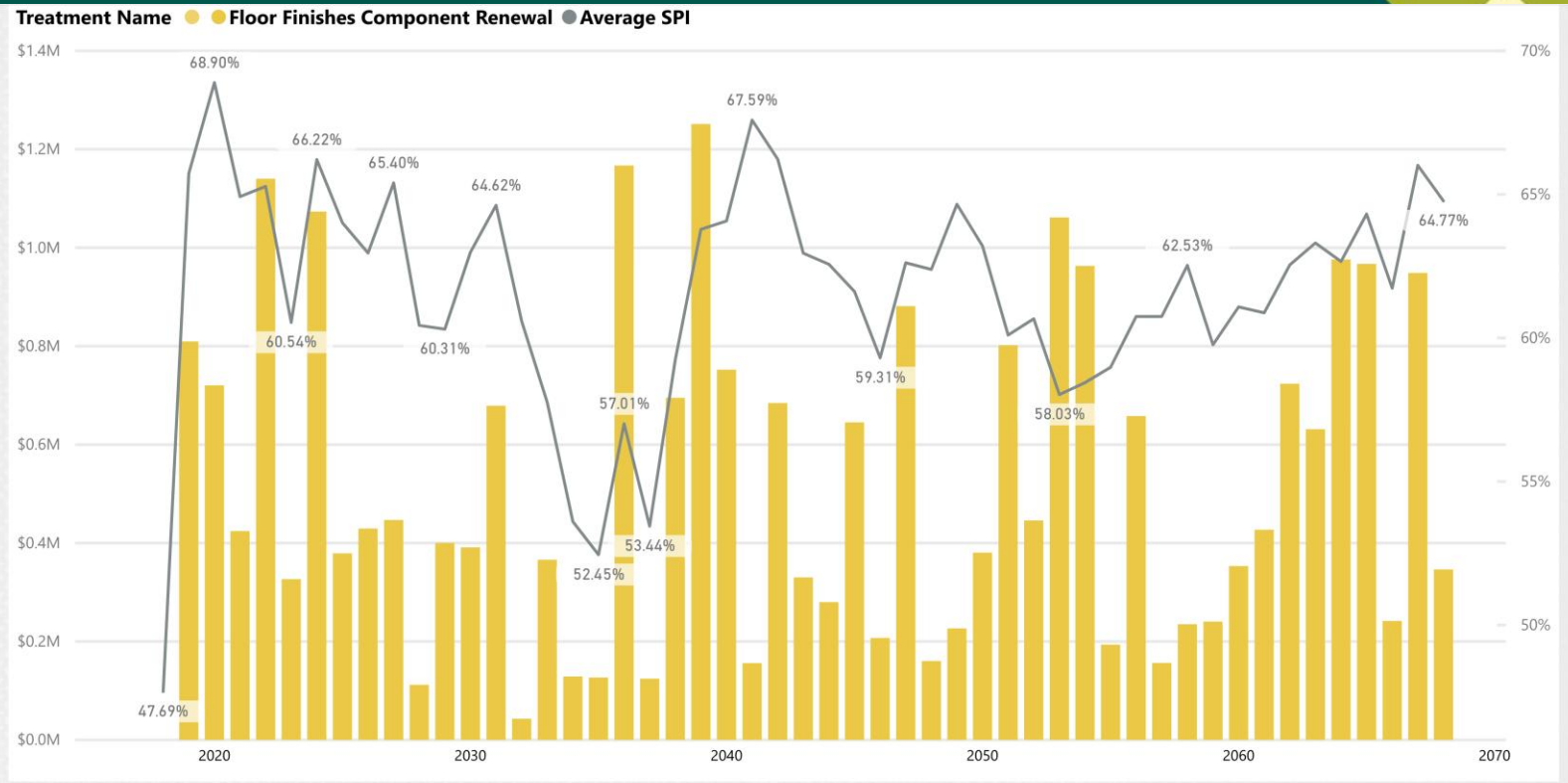
Asset Name
- Allnutt Park-Exeloo (PTno.01)
- Allnutt Park-Exeloo (PTno.1)
- Bailey Reserve
- Bailey Reserve-Bentleigh East Pre
- Bailey Reserve-Pavilion Toilets (P
- Belsize Avenue ILUS - Unit 1
- Belsize Avenue ILUS - Unit 10
- Belsize Avenue ILUS - Unit 11
- Belsize Avenue ILUS - Unit 12
- Belsize Avenue ILUS - Unit 13
- Belsize Avenue ILUS - Unit 14
- Belsize Avenue ILUS - Unit 15
- Belsize Avenue ILUS - Unit 16
- Belsize Avenue ILUS - Unit 17
- Belsize Avenue ILUS - Unit 18
- Belsize Avenue ILUS - Unit 19
- Belsize Avenue ILUS - Unit 2

No. of Renewals

751

Total Renewal Cost

$26M



Superstructure | Roof | Floor Finishes | Mechanical | Electrical | Security

Substructure | Fittings/Finishes | Hydraulic | Fire | Externals | Site Services

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Digital Twin Analytics- Multiple Future Choices

Simulation

- ☐ Option 1 - Current Funding
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Asset Name

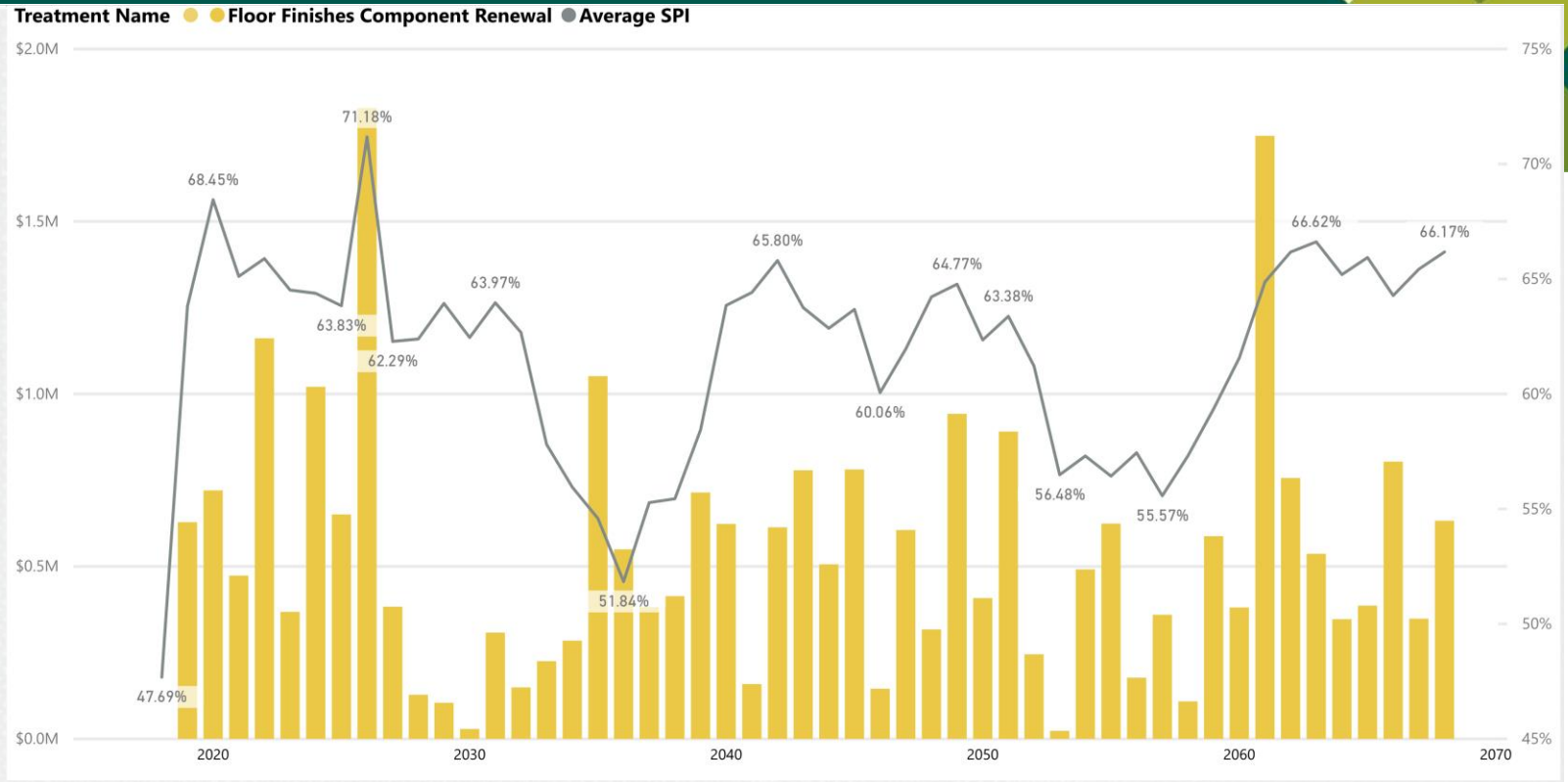
- ☐ East Bentleigh Senior Citizens Ce
- ☐ East Caulfield Reserve Exeloo (PT
- ☐ East Caulfield Reserve Hall
- ☐ East Caulfield Reserve-Main Pavil
- ☐ EE Gunn Reserve
- ☐ EE Gunn Reserve Exeloo (PTno.1E
- ☐ EE Gunn Reserve Exeloo (PTno.5C
- ☐ Elsternwick Library
- ☐ Elsternwick M&CH
- ☐ Glen Eira Historical Society
- ☐ Glen Eira Sports & Aquatic Centr
- ☐ Glen Eira Sports & Aquatic Centr
- ☐ Glen Eira Sports & Aquatic Centr
- ☐ Glen Eira Town Hall
- ☐ Glen Eira Town Hall-Caulfield Chi
- ☐ Glen Eira Town Hall-Caulfield Lib
- ☐ Glen Eira Town Hall-Oak Tree Ho

No. of Renewals

758

Total Renewal Cost

$27M



Superstructure	Roof	Floor Finishes	Mechanical	Electrical	Security
Substructure	Fittings/Finishes	Hydraulic	Fire	Externals	Site Services

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Digital Twin Analytics- Multiple Future Choices

Simulation

- [x] Option 1 - Current Funding
- [ ] Option 2 - Optimised Budget
- [ ] Option 3 - Zero Capital Budget
- [ ] Option 4 - 25% Budget Reduction

Asset Name

- [ ] Belsize Avenue ILUS - Unit 9
- [ ] Bent Street West Carpark Exeloo
- [ ] Bent Street West Carpark Exeloo
- [x] Bentleigh Library
- [ ] Bentleigh Library - Exeloo
- [ ] Bentleigh Library Youth Centre
- [ ] Bentleigh Maternal & Child Healt
- [ ] Bentleigh Senior Citizens Centre
- [ ] Bentleigh West Kindergarten
- [ ] Bentleigh/Hodgson Reserve
- [ ] Bentleigh/Hodgson Reserve-Ben
- [ ] Bentleigh/Hodgson Reserve-Doc
- [ ] Bentleigh/Hodgson Reserve-Mai
- [ ] Bentleigh/Hodgson Reserve-Pavi
- [ ] Booran Road Reserve Exeloo No.
- [ ] Booran Road Reserve Exeloo No.
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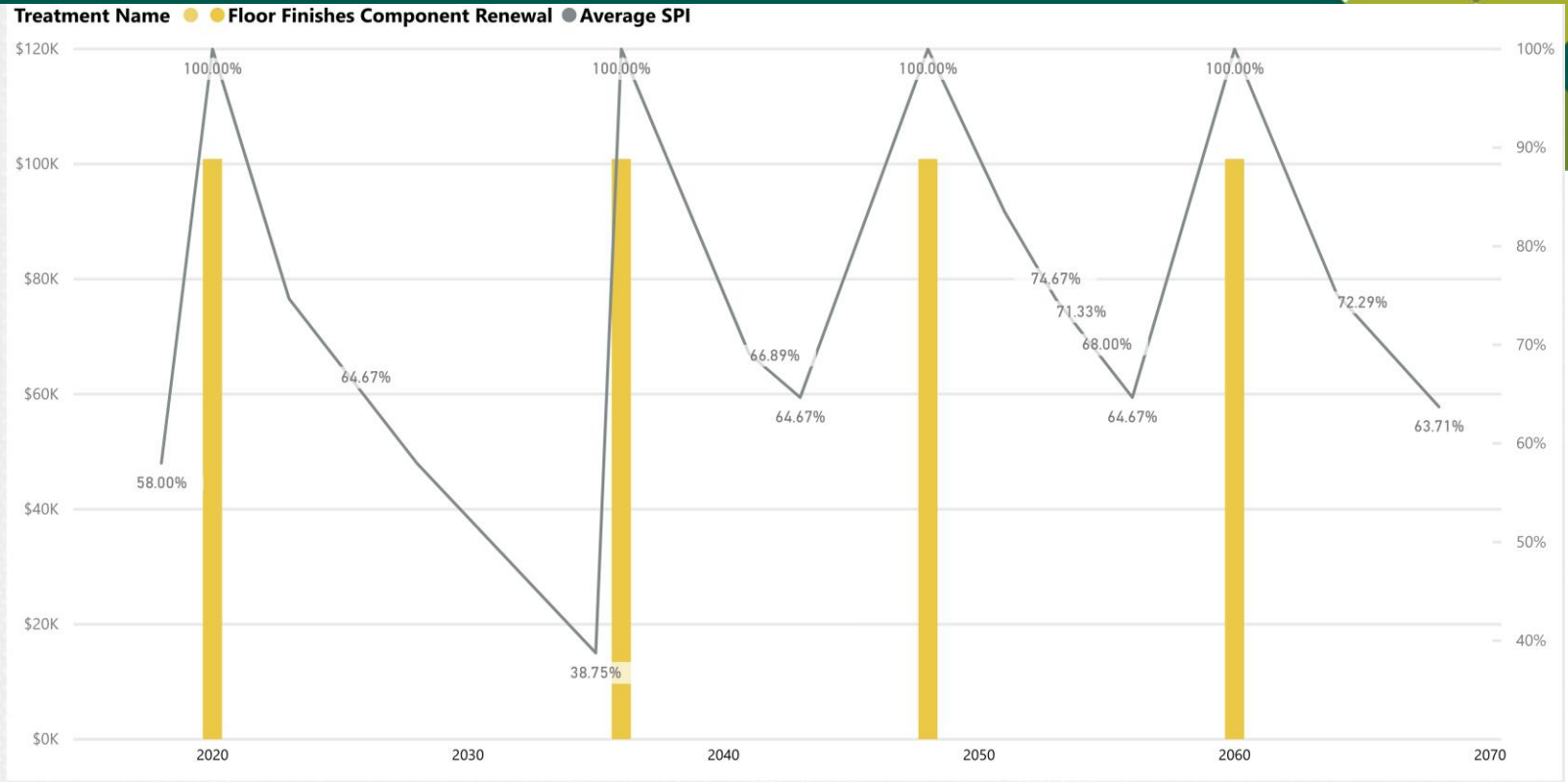
No. of Renewals

4

Total Renewal Cost

$404K



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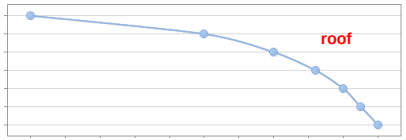
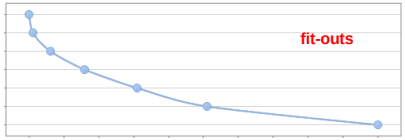
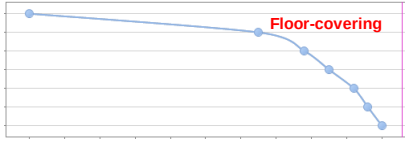
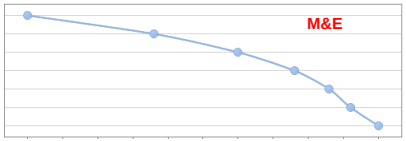
DNA OF Digital Twin – For AIP Based Planning









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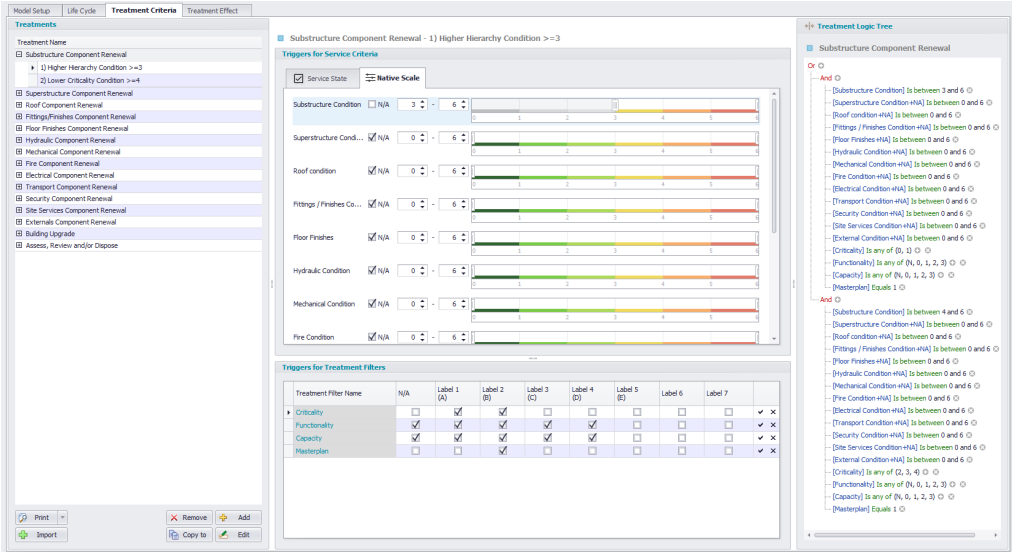


DNA of the Digital Twin AIP

1. Digital Twin Component Framework
2. Health Assessment Framework:

Calculated Raw Score Condition Rating:

	Severity				
	S1	S2	S3	S4	S5
	M1	M2	M3	M4	M5
0	X1	X2	X3	X4	X5

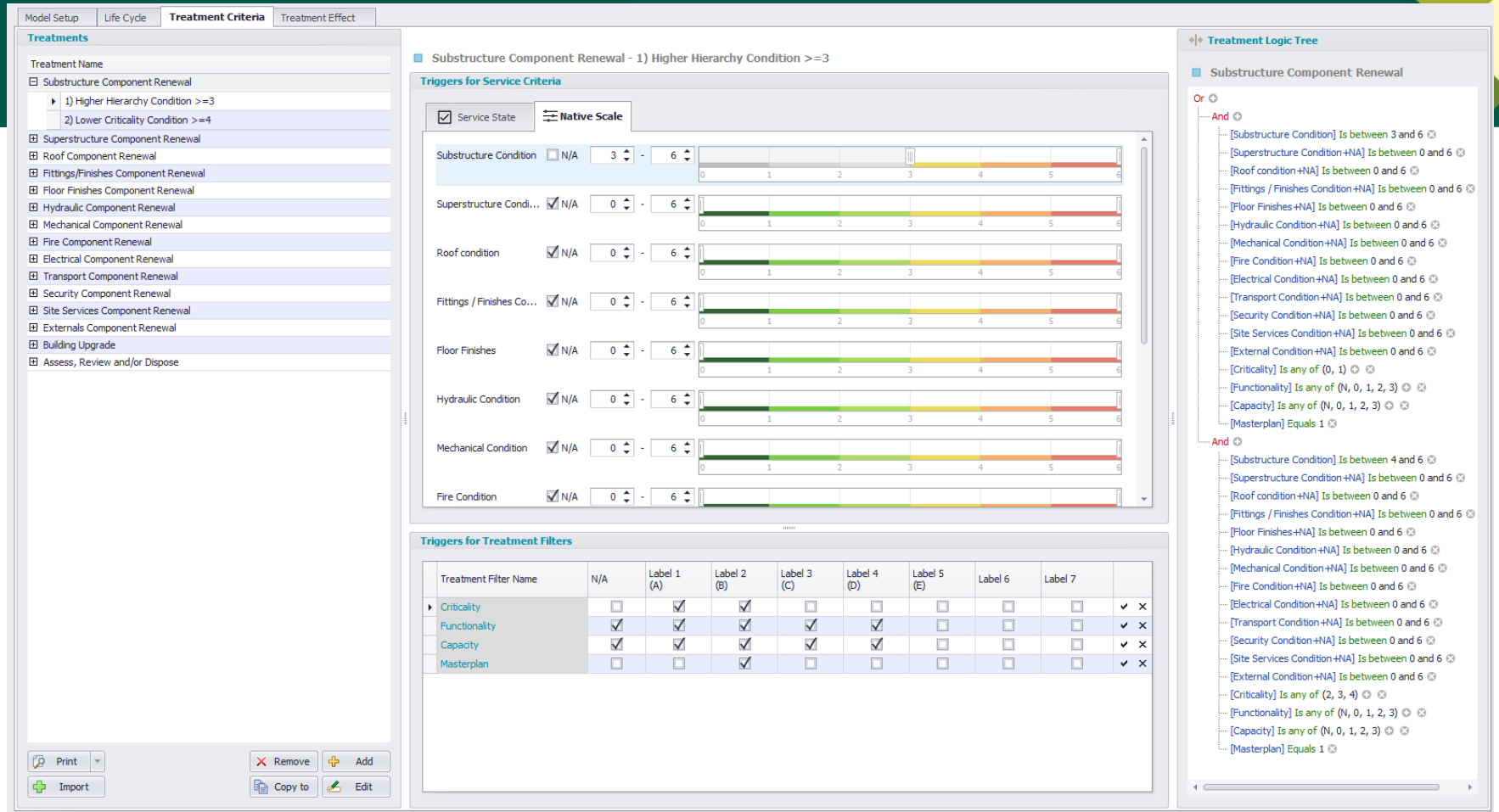
1. Criticality Framework
2. What if Scenarios and Trade Offs

Scaling Legend:

Code	Condition Overall Rating
	0
	1
	2
	3
	4
	5

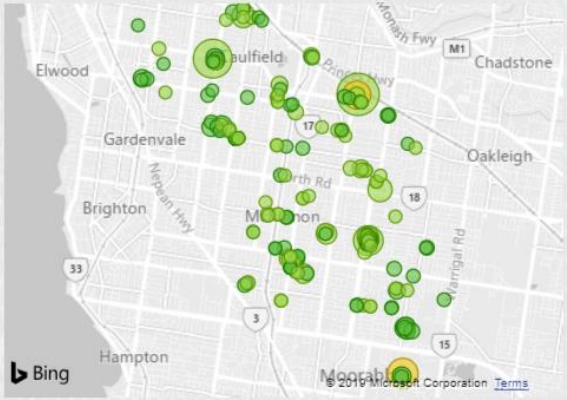
KnowLedge
ASSET MANAGEMENT SERVICES

DNA of the Digital Twin AIP

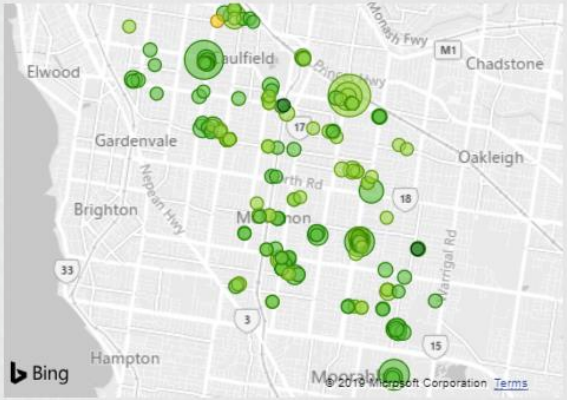


Future Options

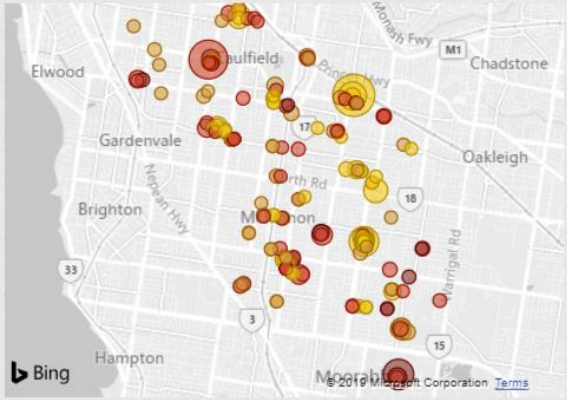
Option 1- Current Budget at Year 10



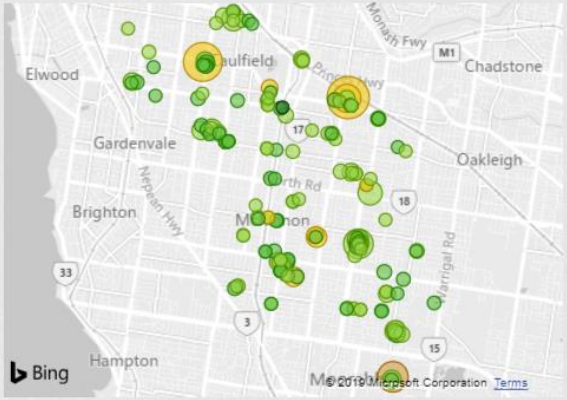
Option 2 - Optimised Budget at Year 10



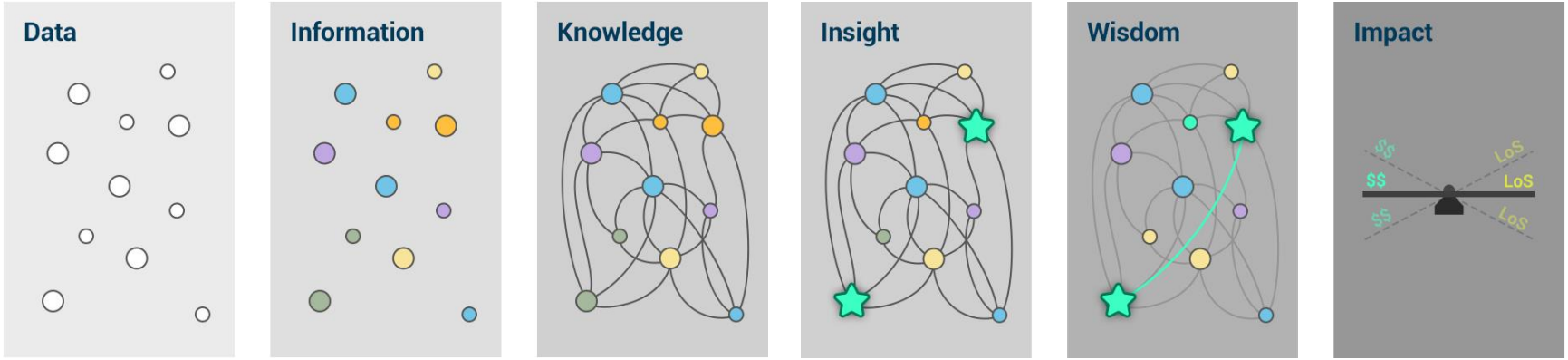
Option 3 - Zero Budget at Year 10



Option 4 - 25% Budget Reduction at Year 10

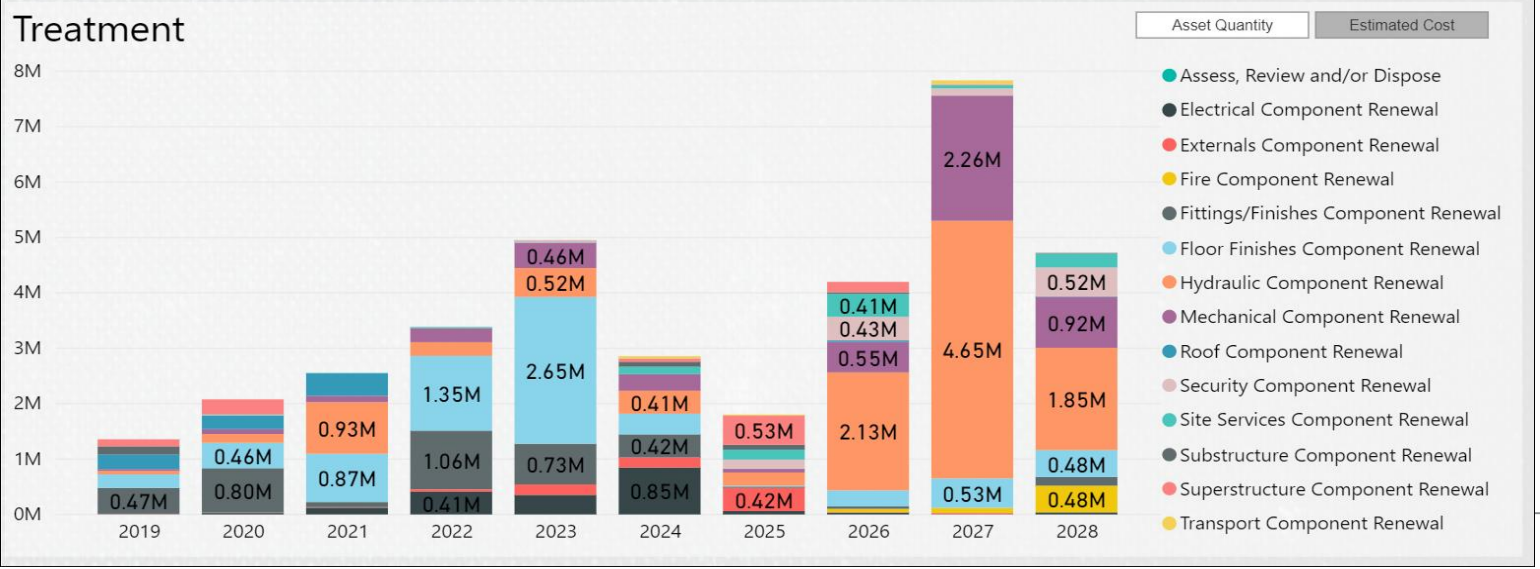


Data-Wisdom – Pendulum Shift



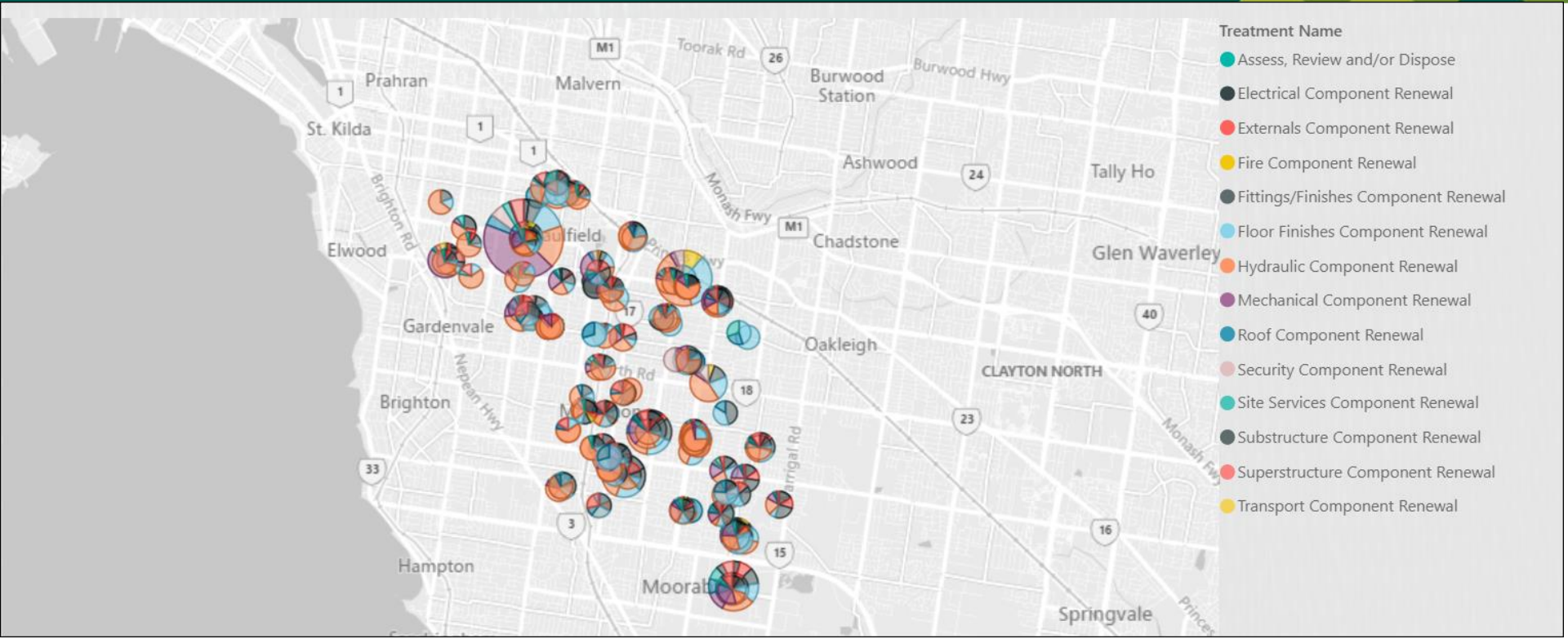
AIP for Optimised Scenario

Number of Treatments	Total Treatment Cost	Number of Components
699	$36M	232



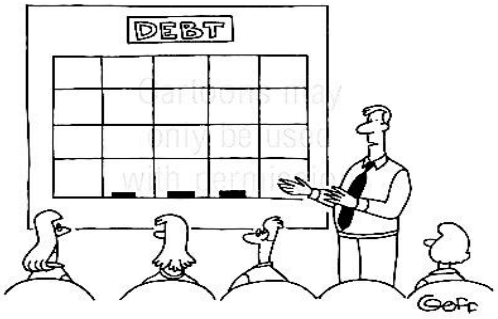
"By implementing my plan, we can save 1¢ every ten years."

Digital Twin – AIP Work Bank



What is the ROI?

1. **Backlog:** Reduction of 24%
2. **Efficiency:** 4 months down to 2 weeks for developing annual budgets and final Capex programs
3. **Governance:** Increased ability to trade off service levels for better service delivery



"Of course, this is only 1/100,000,000th actual size."

THANK YOU

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