

The University of Texas at Austin Deferred Maintenance/ Capital Renewal Case Study

Challenges Solutions

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Course Description

Capital Renewal is a facilities management professionals' tool to manage assets in their portfolio.



Learning Objectives

- Understand Capital Renewal
- Understand how Capital Renewal applies to higher education
- Understand how you can apply Capital Renewal techniques to your campus today

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Emphasizing Risk Challenges & Solutions

- ➔ Other Universities
- ➔ UT Austin – Real Time
- ➔ UT Austin – Forward Looking

Real life CHALLENGES AND SOLUTIONS

**Deferred Maintenance
Deferred Capital Renewal**
We know we have challenges

**Radical
Approaches**

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**Institutions with
Diminutive DM**



University of Virginia

Founded in 1819

12
SCHOOLS

21.9k
STUDENTS

12k
FACULTY AND STAFF

125 buildings
10M sq ft

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Deferred Maintenance Backlog at the University of Virginia



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Source: University of Virginia, Charlottesville, VA, Facilities Forum interview and analysis

Middle of the Road Approach

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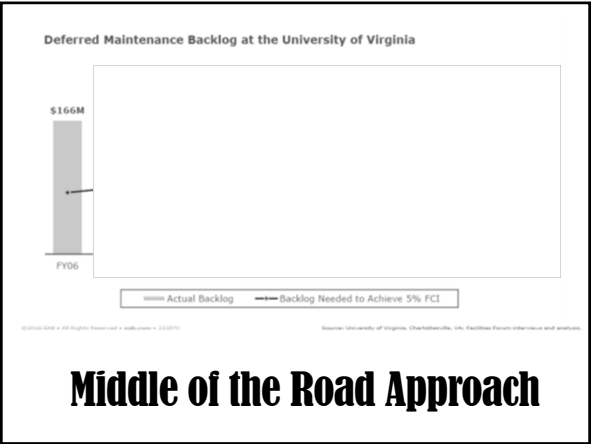
A ten-year strategy to improve its E&G facilities from "poor" condition to "good" condition by reducing the facility condition index (FCI) from 10.6% in 2004 to 5% by 2015.

DOUBLED FUNDING IN 2008
from an average of ~\$3M since 1982 to \$7M in 2008

Established annual maintenance funding to prevent further accumulation of DM by increasing the current 1.2% reinvestment rate to a 2% annual reinvestment rate.

INCREASED FUNDING ANNUALLY
from an average of 1.2% to 1.86% in 2014
also budget 2 percent of construction costs to maintain each new building brought online

University of Virginia Middle of the Road Approach



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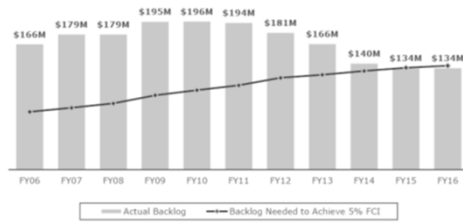
2004	2015
\$166M DM	\$134M DM
10.6% CCI	5% CCI

University of Virginia
Middle of the Road Approach

By the numbers:

2004		2015
\$166M DM	-\$32M	\$134M DM
\$1.7B CRV	\$1B	\$2.7B CRV
10.6% CCI		5% CCI

University of Virginia
Middle of the Road Approach



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Հայտնի ընկերակից ձևերի միջոցով հարկային կտրուկներ և/կամ հարկերի վերադարձի իրավունքի ձեռքբերումը:

Middle of the Road Approach



What accounts for their success?

[illegible]

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Middle of the Road Approach

How do you get your DM/DCR?

Solution

How do you get your CRV?

How do you know what to spend on first? prioritize?

Developing an Effective Facilities Management Program

Trust and Credibility

- Well defined planning process
- Transparency
- Technically sound data and analysis

Stewardship/Sustainability

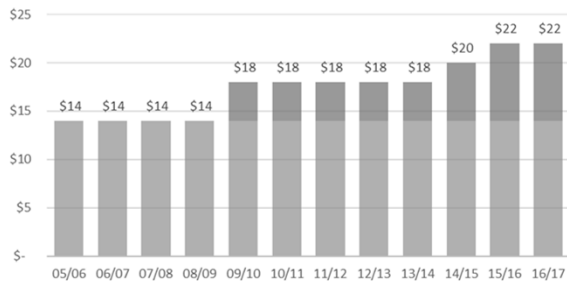
- Maintaining a critical resource
- Make effective use of funding
- Managing risk

Communication Strategy

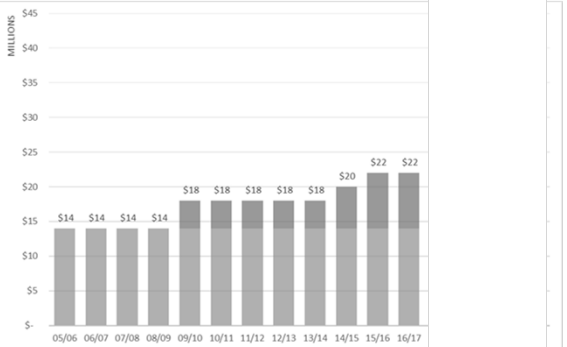
- Identify key stakeholders
- Develop appropriate communication & information

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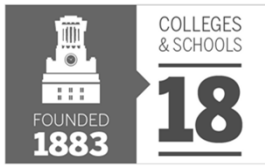
Spoiler!



Spoiler!

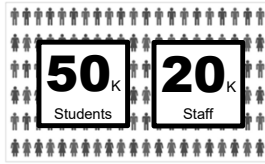


The University of Texas at Austin

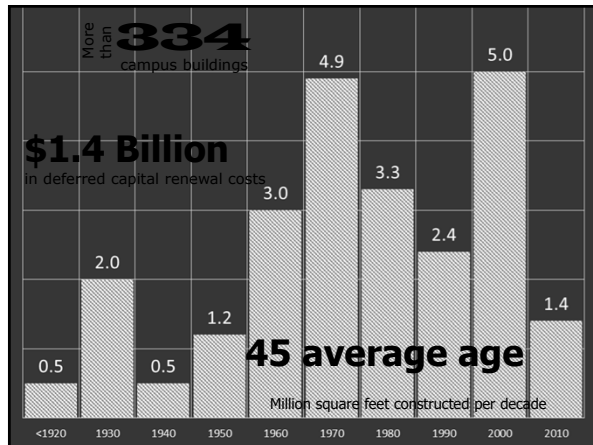


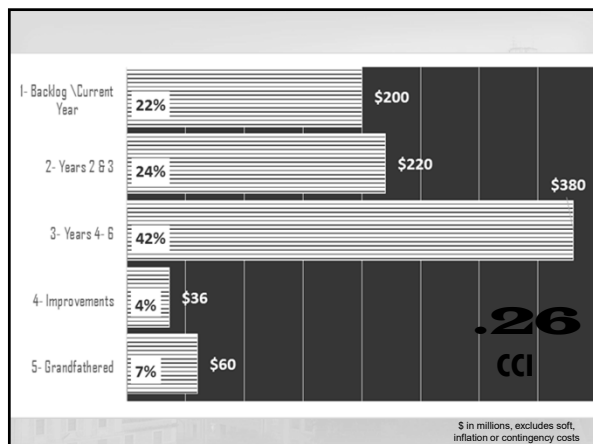
COLLEGES
& SCHOOLS

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Turtle Approach





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Assessing Capital Renewal Needs

“Rule of Thumb”

Age Based
Predictive
modeling

Condition
Based

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Assessing Capital Renewal Needs

“Rule of Thumb”
UT Austin

CRV

DM

Market Cost per Square Foot
Insurance Valuation

1.5% - 3%

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Assessing Capital Renewal Needs

“Rule of Thumb”
UT Austin

\$3 Billion CRV	
1.5% - 3%	\$45M - \$90M
Annual Allocation (15/16)	\$22M
% of CRV (15/16)	.73% (<1%)
% of CRV (2-3 yrs)	.60% and .50%

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Assessing Capital Renewal Needs

“Rule of Thumb”

UT Austin

- How do you get your DM/DCR?
- CRV?
- How do you know what to spend on first? Prioritize?

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Assessing Capital Renewal Needs

“Rule of Thumb”

UT Austin

- DM/DCR and CRV are estimates. Assumes no major backlog.
- Missing -How do you know what to spend on first? Prioritize?

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Assessing Capital Renewal Needs

Age Based Predictive modeling

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Figure 1 - ASTM UNIFORMAT II Classification of Building Elements (E1557-97)			
Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	
D. SERVICES	D10 Conveying Systems	#1010 Elevators #1020 Escalators & Moving Walks #1030 Material Handling Systems	
	D20 Plumbing	#2010 Plumbing Fixtures #2020 Domestic Water Distribution #2030 Sanitary Waste #2040 Rain Water Drainage #2050 Special Plumbing Systems	
	D30 HVAC	#3010 Energy Supply #3020 Heat Generating Systems #3030 Cooling Generating Systems #3040 Distribution Systems #3050 Terminal & Package Units #3060 Controls & Instrumentation #3070 Special HVAC Systems & Equipment #3080 Systems Testing & Balancing	
	D40 Fire Protection	#4010 Fire Protection Sprinkler Systems #4020 Stand-Pipe & Hose Systems #4030 Fire Protection Specialties #4040 Special Electrical Systems	
	D50 Electrical	#5010 Electrical Service & Distribution #5020 Lighting & Branch Wiring #5030 Communication & Security Systems #5040 Special Electrical Systems	

System Name
System CRV
System Age
System Life Cycle

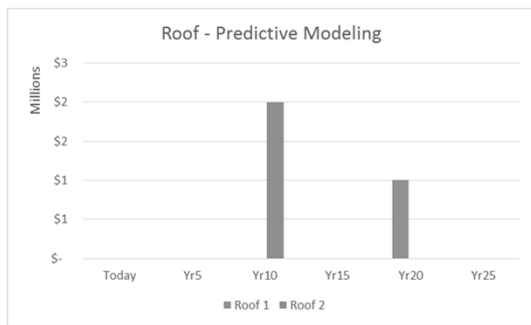
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Predictive Modeling

System Name	System CRV	System AGE	System LCC
Roof 1	\$ 1,000,000	New	20
Roof 2	\$ 2,000,000	10	20

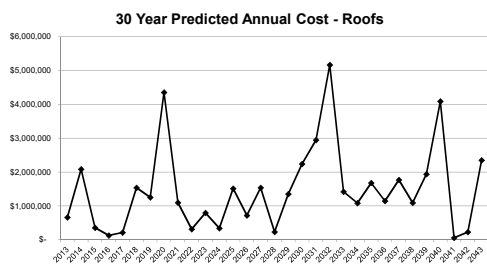
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Predictive Modeling



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Predictive Modeling – Roofs



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Assessing Capital Renewal Needs

• How do you get your DM/DCR?

• CRV?

• How do you know what to spend on first? Prioritize?

Based on age

Age Based
Predictive
modeling

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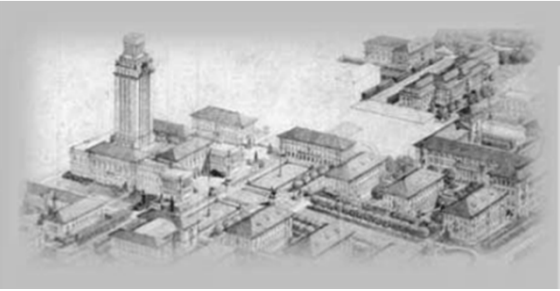
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Assessing Capital Renewal Needs

Condition
Based

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Facility Condition Assessments



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Reinvestment Categories

A – Recently Replaced or Renewed	CI .00 to .15
B – Moderate R&R Allocation	CI .16 to .40
C – Heavy R&R Allocation	CI .41 to .60
D – Capital Project	CI > .61

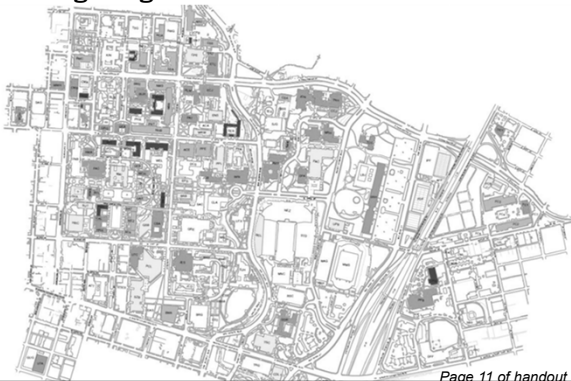
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Reinvestment Categories

A – Allow to Age Gracefully	FCI .00 to .15
B – Bandage as Needed	FCI .16 to .40
C – Can Be Saved	FCI .41 to .60
D – Do a Capital Project (CIP)	FCI > .60 +

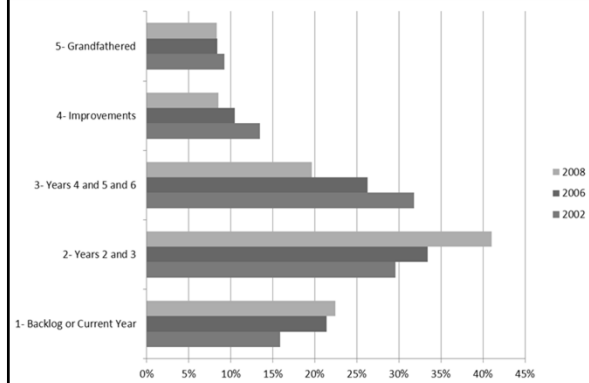
Communication

Building Categories



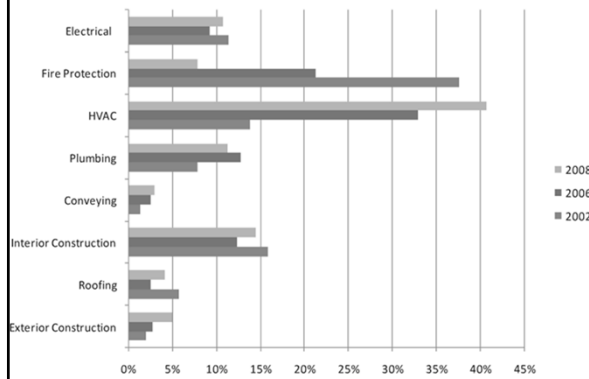
REQUIREMENT PRIORITIES

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System Changes in Priority 1

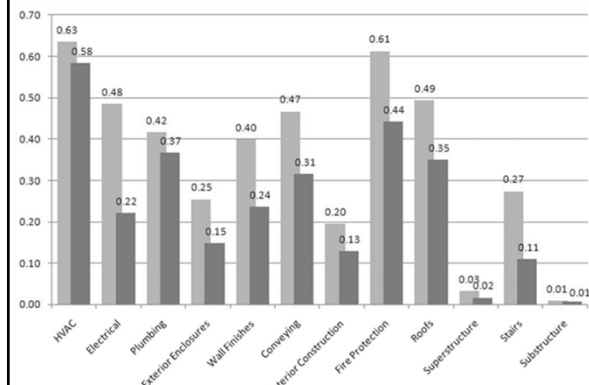
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**Minimizing Risk
Combining Data
for
Communication**

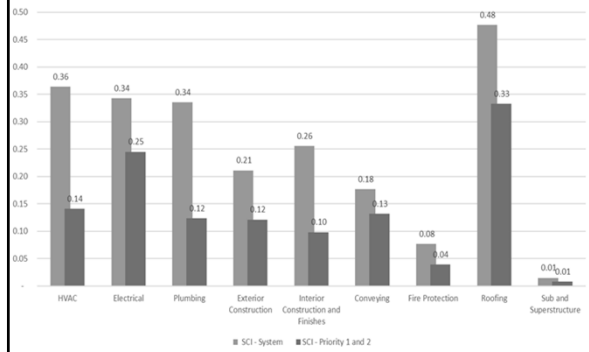
Data to Decisions 2009

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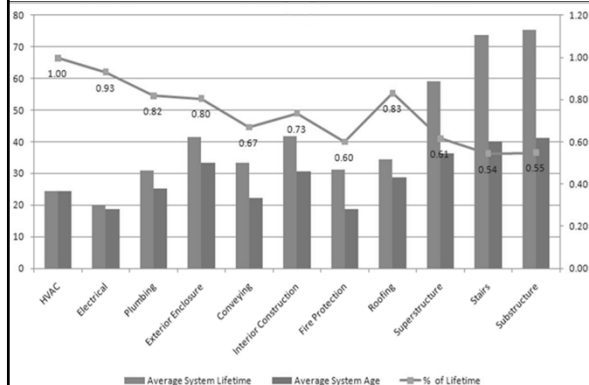
Data to Decisions 2018

2018 Assessment Data



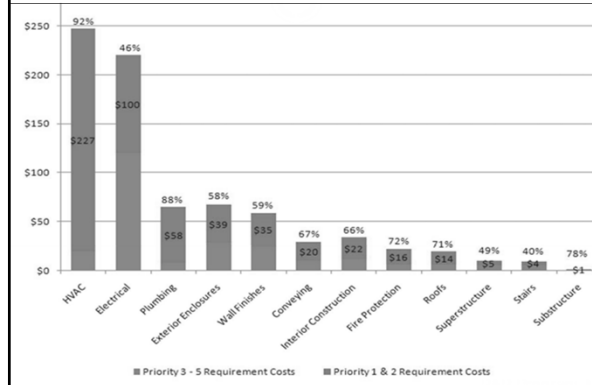
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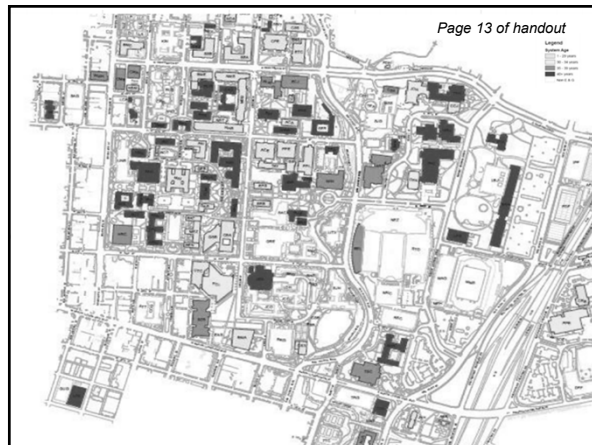
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Data to Decisions

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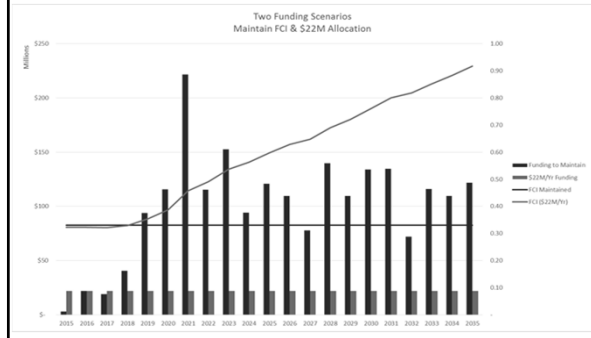




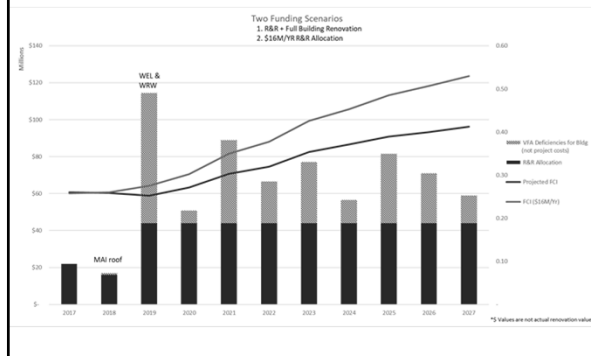
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CONTINUING to Minimize Risk
Combining Data
for
Communication

Performance Metrics



Creating Solutions



Goal: Stabilize FCI / Minimize Risk

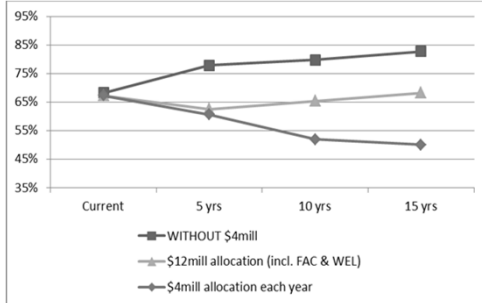
Strategy: \$44M / annually over next 3 yrs

Addresses 10% of capital renewal backlog totaling \$1.4B

Replacement & Renewal (R&R) Recommended Allocations			
16/17	17/18	18/19	19/20
7% of Backlog \$22M	15% of DCR Backlog \$44M	15% of DCR Backlog \$44M	15% of DCR Backlog \$44M
0.26 FCI	0.25 FCI	0.25 FCI	0.26 FCI

Performance Metrics - RISK

% of Buildings with HVAC over 25 Years



FCI – UT History

\$919 Million
divided by

\$2.1 Billion

UT Austin 2009
.44 FCI

\$1.4 Billion
divided by

\$5.2 Billion

UT Austin 2017
.26 FCI

+\$428 Million
divided by

+\$3.1 Billion

Change
-.18 FCI

\$53.5M / year or 30% increase of DM on average

\$390M / year increase of CRV

PRIORITIZATION

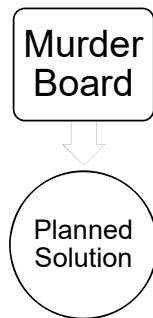
Solutions

Prioritizing Objectives – Based on Risk

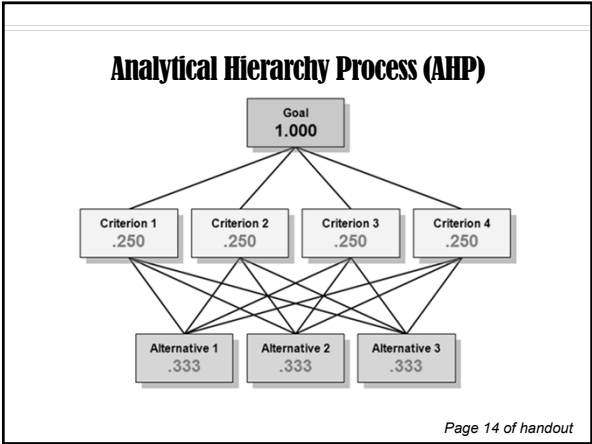
- Identify critical areas
- Support university's strategy
- Consistent, repeatable, and defensible decisions
- Rank relative to each other
- Allow ranking within and between project selection
- Encourage bottom-up initiation
- Incorporate wisdom of others
- **Easy to communicate**

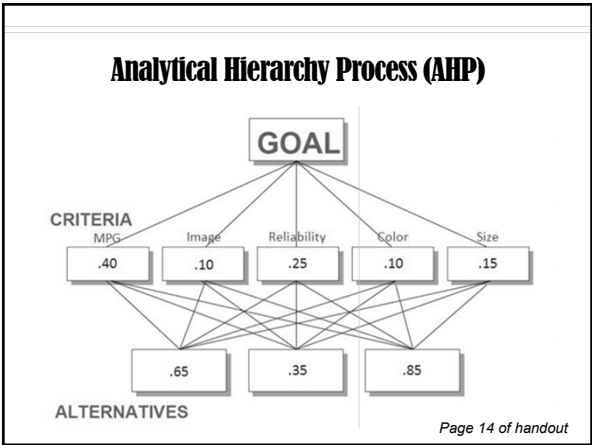
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Past Approach to Prioritizing Critical Needs









Risk to University

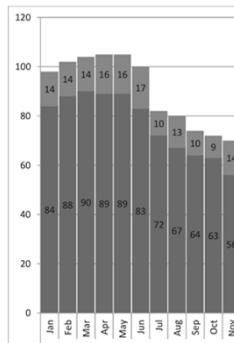
Area	Criteria	New
Impact on Health, Safety & Environment	Impact on People	30
	Impact on Environment	8
Mission (Risk) Impact	Intellectual Property Damage	8
	Property Damage	5
	Time Disruption	6
	Area Impact	10
	Public Image	5
System Impact	ROI	20
	Probability of Failure	8
Total		100.00

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SUSTAINING SOLUTIONS

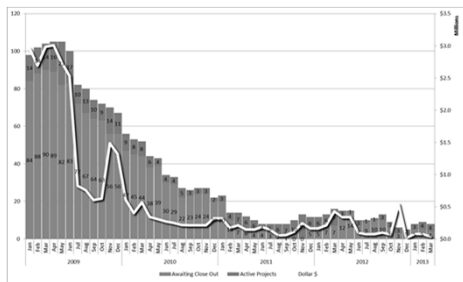
Solutions

Dormant Projects



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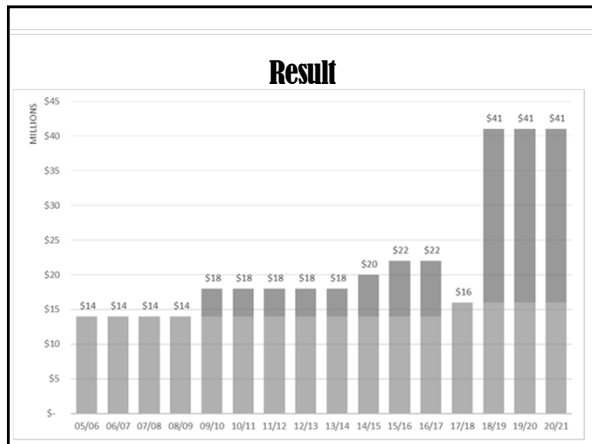
Resolve

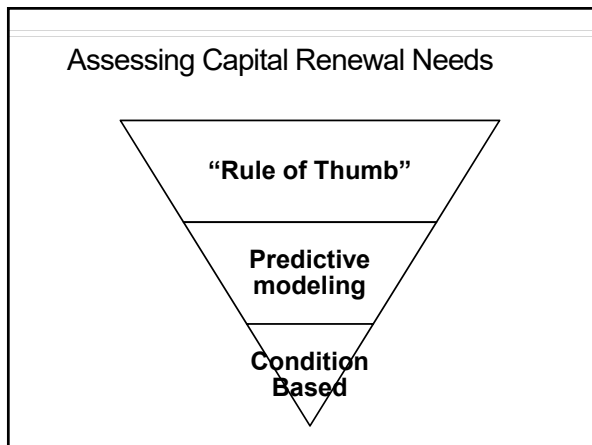


Accounting

Incentive

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Assessing Capital Renewal Needs

- **How do you get your DM/DCR?**
- **CRV?**
- **How do you know what to spend on first? Prioritize?**

Condition Based

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Assessing Capital Renewal Needs

- **DM/DCR is based off of age, condition, actual performance**
- **CRV is based off of RS Means values apples to apples**
- **You know exactly where to spend first and how to prioritize**

**Age Based
Predictive
modeling**

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Developing an Effective Facilities Management Program

Trust and Credibility

- Well defined planning process
- Transparency
- Technically sound data and analysis

Stewardship/Sustainability

- Maintaining a critical resource
- Make effective use of funding
- Managing risk

Communication Strategy

- Identify key stakeholders
- Develop appropriate information

Thank you

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