

FIVE STEPS TO PROACTIVE FACILITY MAINTENANCE PLANNING

Presenters:
Mark Sigel, PE
Tim Kittila, PE



Learning Objectives

1. Why?
2. Teach the 5 step methodology
3. Review the IFMA FCA standards and FCI
4. Importance of a long-term facility maintenance plan
5. Identify tools that can be used to improve findings

Today's Presenters



Mark Sigel, PE

- CHC
- LEED AP
- PE
- 30 Years of experience construction with a focus on healthcare



Tim Kittila, PE

- PE
- 19 Years of experience in mission critical D/B
- Focused on Facility Assessments

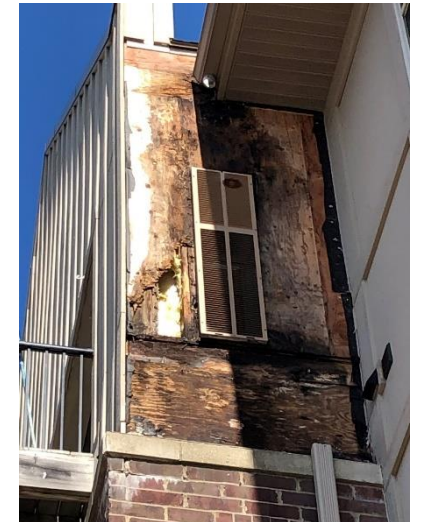


Why?

2nd Law of Thermodynamics

Noun

- 1) a law stating that mechanical work can be derived from a body only when that body interacts with another at a lower temperature;
- 2) any spontaneous process results in an increase of entropy



Why?



5 Step Methodology



Develop Talent

The people you choose is

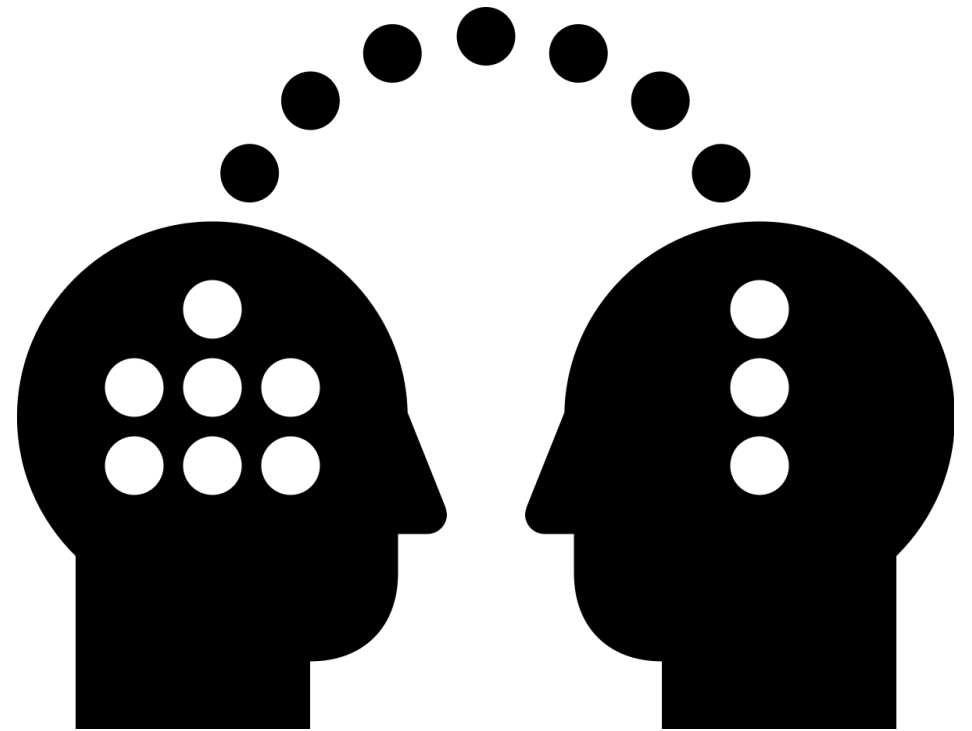
***MORE
IMPORTANT***

than the systems you use.



Develop Talent

- Clarity on role
- Clarity of expectations
- Clarity of communication



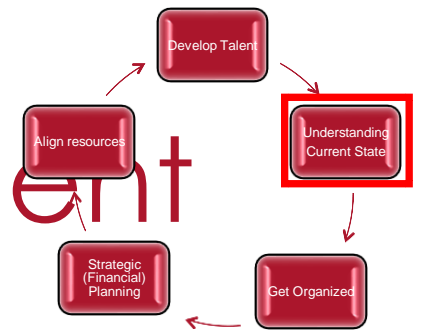
“Knowledge Transfer”

Understanding Current State



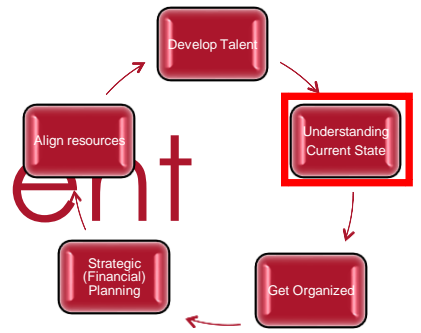
- Completing a Facility Condition Assessment
- Measuring your facility status- Facility Condition Index
- Identifying deferred maintenance, upcoming facility expenditures

FCA- Facility Condition Assessment



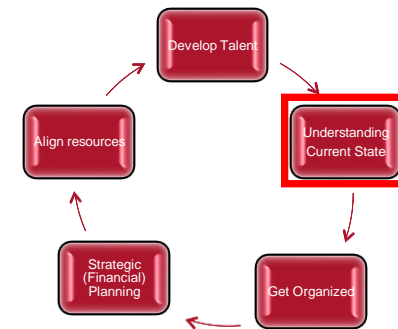
- Many types of assessments industry-wide
- Best fit: 1990's Facility Condition Assessment "FCA"
 - *IFMA Standard*
 - *AKA Facility Condition Inspection Program*
 - *Utilized by Gov't, University, Schools, Housing, Transportation*
- Provided a methodology to analyze facilities

FCA- Facility Condition Assessment



- Purpose:
 - *The strategic, prudent, and necessary improvements protecting and ensuring the long term stability of facilities*
- FCA identifies the following:
 - *Facility's current condition*
 - *Remedial actions and priorities*
 - *Estimated costs for remediation*
 - *“Deferred Maintenance” = maintenance not performed when it should be or when it was scheduled and was delayed*
 - *Not included: Operational maintenance, appearance, normal usage*

Understand Current State



Bottom Line: Collect



KA-FA General Medical Center

General Medical Center

Prepared by Timothy Kitila
Mar 30, 2022



Description
157 tasks in this report.

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- #14 05-Exterior Enclosure 41
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KA-FA General Medical Center

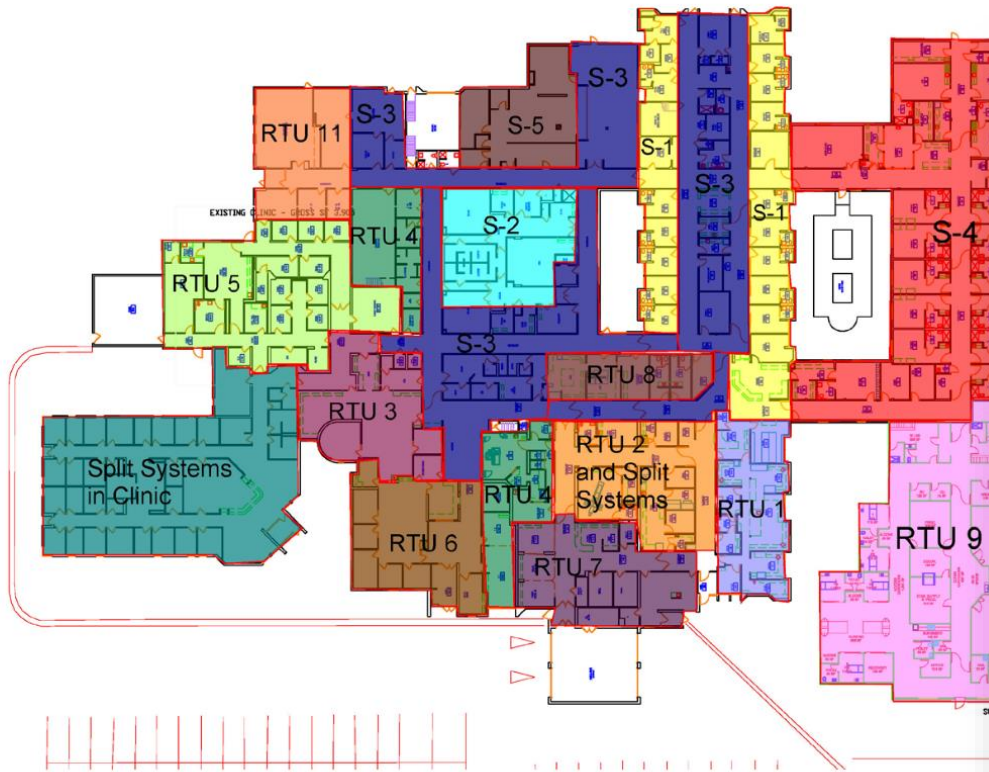
#27 05-Exterior Enclosure

Status Open	Created Feb 15, 2022 11:44 AM tim.kitila@krausanderson.com	Sheet Site Map
Type Issue	Last Updated Feb 15, 2022 12:03 PM	
List Repair		
Root Cause Condition > 2-Fair		
Description Boxes over windows- replace with non wood product.		
Photos		
	20220215_104450_photo Timothy Kitila Feb 15, 2022 11:44 AM	

Understand Current State



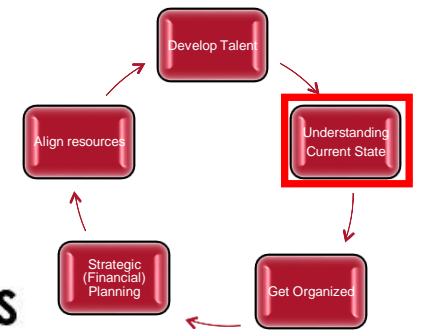
3 AIR UNIT ZONING MAP



4 ROOF AERIAL IMAGE



Understand Current State



BUILDING DOCUMENTATION TOOLS

DIGITAL TWIN

Our distinctive digital twin platform provides a dynamic, data-rich virtual replica of the built environment. The digital twin provides a visual common ground to support construction, close-out, and asset management.

Benefits

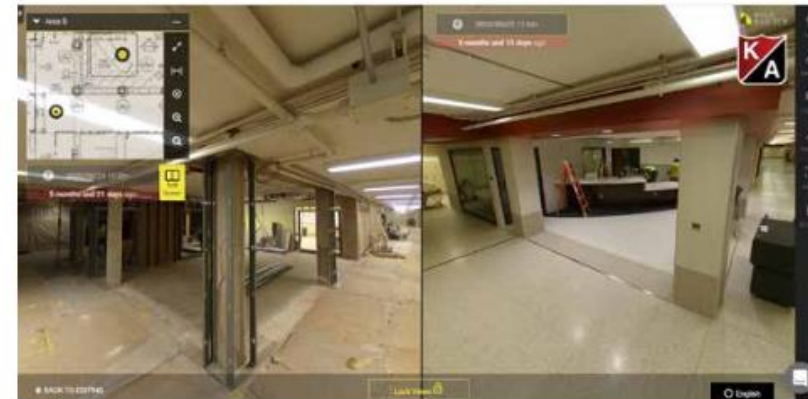
- Centrally capture and store visual data to support facility operations, maintenance, and risk management
- A single source of truth for facility management team
- Dynamic virtual tours of built environments

360° CAMERA

Our 360° cameras enable the project team to monitor construction progress at crucial points in the project, such as demolition, rough-ins, and fit-out. Furthermore, these cameras afford the broader project team remote access to the jobsite, unlocking valuable efficiencies across the project life-cycle.

Benefits

- Complete understanding of the built environment with one image
- Dynamically link 360° photos to floor plans
- Archive project data and imagery
- Accelerate installation and unlock off-site fabrication opportunities
- Enhance communication across the project team



Understand Current State



CAPTURE & ANALYZE

Drone imagery provides a unique vantage point to assess progress and accelerate decision-making.

Benefits

- Verify and analyze field conditions (e.g., site topography, construction progress)
- Thermal analysis
- Safe and convenient site documentation
- Marketing Opportunities



Thermal Drone Analysis

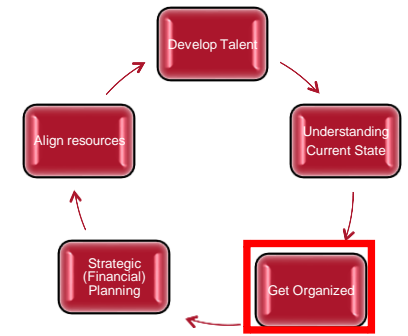


Site Model Created from Drone

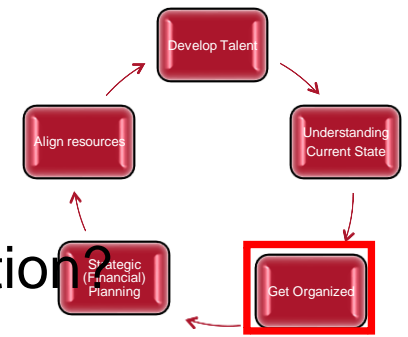


Get Organized

- Reviewing and organizing the information
- Clarifying what needs to be done:
 - *Repair*
 - *Replace- new or like-for-like*
 - *Proactive replacement*
 - *Adequacy*
 - *Run-to-Fail*
- Prioritizing (year or preference)
- Estimating
- Identify criticality



Get Organized



- What is the issue/item?
- What is the condition?
- What is the criticality?
- What is the proposed solution?

- What is the proposed timing of resolution?
- What are the costs?
- Are there phasing considerations?
- What is the impact of inflation?



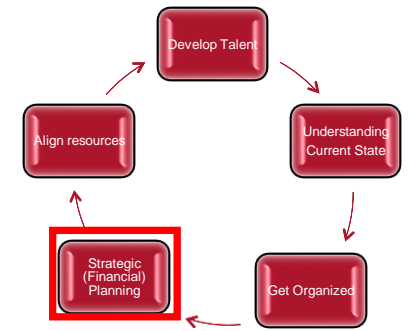
Project	General Medical Center Facilities Assessment
Facility Name	General Medical Center
Construction Date	1949
SF	80000
Phase 2	2005
Phase 3	2012

Clinic Original Build	1935
Clinic Remodel- 1	1985
Clinic Remodel- 2	2003

KRAUS-ANDERSON[®]
 Kraus-Anderson Construction Company
 501 South Eighth Street, Minneapolis, MN 55404

Building	Digitized Site Report Item#	Area of work	Location (Sheet Name)	Description of work	Resolution	Resolution Description	Current Condition	Criticality	Installed year	Lifetime Expectancy/RUL	Replacement Year	Quantity	Unit of measure
MCMC	36	02-Sitework/Building Earthwork	MCMC- Exterior	Monument at corner of building	Deferred Maintenance	No major changes at this time	1-Good	1-Low	2012	30	2042	1	Allowance
MCMC	4	02-Sitework/Building Earthwork	MCMC- Exterior	Parking lot- employee asphalt lot 2019 was seal coated	Replace (like for like)	Re-stripe parking lot	1-Good	1-Low	2019	25	2044	10,400	SF
MCMC	4	02-Sitework/Building Earthwork	MCMC- Exterior	Parking lot- Seal Coat Asphalt lot	Replace (like for like)	Seal Coat	1-Good	1-Low	2019	5	2024	10,400	SF
MCMC	42	02-Sitework/Building Earthwork	MCMC- Exterior	Parking Lot- Visitor concrete lot 2012	Deferred Maintenance	Re-stripe parking lot	1-Good	1-Low	2012	25	2037	19,200	SF
MCMC	2, 18, 34	02-Sitework/Building Earthwork	MCMC- Exterior	Parking lot- West employee cement lot 2003	Replace (like for like)	Re-stripe parking lot	1-Good	1-Low	2003	25	2028	34,000	SF
MCMC	46	02-Sitework/Building Earthwork	MCMC- Exterior	Phased Landscaping	Deferred Maintenance	Update all landscaping phased	2-Fair	1-Low	2023	0	2023	1	Allowance
MCMC	46	02-Sitework/Building Earthwork	MCMC- Exterior	Phased Landscaping	Deferred Maintenance	Update all landscaping phased	2-Fair	1-Low	2024	0	2024	1	Allowance
MCMC	46	02-Sitework/Building Earthwork	MCMC- Exterior	Phased Landscaping	Deferred Maintenance	Update all landscaping phased	2-Fair	1-Low	2025	0	2025	1	Allowance
MCMC	44	02-Sitework/Building Earthwork	MCMC- Exterior	Water from roof on sidewalk. Fix in three locations.	Repair	Replace sidewalk with a new pass through section that allows water to run underneath the sidewalk as is installed on the other side of the sidewalk	3-Poor	3-High	2012	10	2023	1	Allowance
MCMC	25	04-Building Structure	MCMC- Exterior	Control joints need replacement soon	Replace (like for like)	Replace control joints when tuckpointing	2-Fair	2-Medium	2003	20	2023	1	Allowance
MCMC	21	04-Building Structure	MCMC- Exterior	Repair enclosure around air tanks. Add bollards to street side	Repair	Repair enclosure and add bollards	2-Fair	2-Medium	2005	22	2027	1	Allowance
MCMC	9, 13	04-Building Structure	MCMC- Exterior	Tuck pointing will need to be done in a few years	Replace (like for like)	Tuckpoint sections of the building	2-Fair	2-Medium	2005	20	2025	1	Allowance
MCMC	9, 13	04-Building Structure	MCMC- Exterior	Tuck pointing will need to be done in a few years	Replace (like for like)	Tuckpoint sections of the building	2-Fair	2-Medium	2005	25	2030	1	Allowance
MCMC	27	05-Exterior Enclosure	MCMC- Exterior	Boxes over windows- replace with non wood product.	Repair	Replace boxes with non wood product	2-Fair	2-Medium	2005	20	2025	2	EA
MCMC	10	05-Exterior Enclosure	MCMC	Entrance B door- replace sidelight door and frame.	Replace (like for like)	Replace sidelight and frame	3-Poor	2-Medium	1949	50	2023	1	EA
MCMC	17	05-Exterior Enclosure	MCMC- Exterior	Entrance door to ER	Replace (like for like)	No major changes at this time	1-Good	2-Medium			2023		
MCMC	26	05-Exterior Enclosure	MCMC- Exterior	Exterior door	Replace (like for like)	No major changes at this time	1-Good	2-Medium			2023		

Strategic Planning

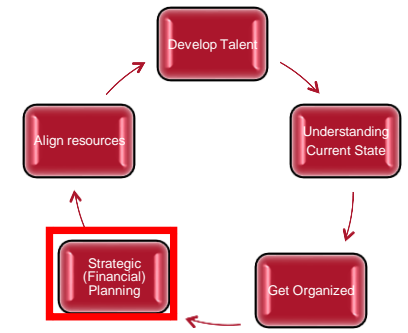


- Measure the facility- “Facility Condition Index”

$$\text{FCI} = \frac{\text{Deferred Maintenance Deficiencies}}{\text{Building Replacement Costs}}$$



Strategic Planning



- Facilities are measured based upon the IFMA Standard

- Identify if the Facility is “worth the investment?”

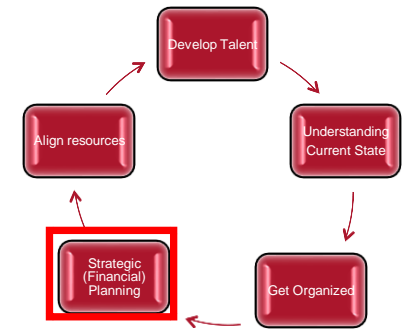
$$\text{FCI} = \frac{\text{Deferred Maintenance Deficiencies}}{\text{Building Replacement Costs}}$$

- AKA – “Catch-up” Costs



- Adding in future expenditures can provide clarity on how to “Stay Ahead”

Strategic Planning



Facility Condition Index

$$\text{FCI} = \frac{\text{Deferred Maintenance Deficiencies}}{\text{Building Replacement Costs}} = \text{“Catch up Costs”}$$

Extended Facility Condition Index

$$\text{EFCI} = \frac{\text{Deferred Maintenance Deficiencies} + \text{Future Backlog } \sum n(\$)}{\text{Building Replacement Costs}} = \text{“Keep-up Costs”}$$

Facility Needs Index

$$\text{FNI} = \frac{\text{Deferred Maintenance Deficiencies} + \text{Future Backlog } \sum n(\$) + \text{Energy Efficiency Measures } (\$) + \text{Regulatory Compliance } (\$) + \text{Other Upgrades and adaptations } (\$)}{\text{Building Replacement Costs}} = \text{“Get-Ahead Costs”}$$

Strategic Planning



- Protect from Facility Drift
- Requires modeling

Facility	Priority 1- FCI Years 0-5	Priority 2- FCI Years 6-8	Priority 3- FCI Years 9-10	Priority 4- FCI Years 11-20
Med Clinic #1	0.7183	0.7227	0.7490	0.8520
Med Clinic #2	0.6194	0.6309	0.6577	0.7829
Med Clinic #3	0.4766	0.4920	0.5504	0.6041
Med Clinic #4	0.4188	0.4638	0.4931	0.6608
Med Clinic #5	0.3369	0.4358	0.4526	0.5843
Med Clinic #6	0.3183	0.3391	0.3183	0.3527
Med Clinic #7	0.2444	0.2523	0.6673	0.7824
Med Clinic #8	0.2307	0.2363	0.3147	0.3923
Med Clinic #9	0.2151	0.2652	0.2964	0.4123
Hospital #1	0.1936	0.2200	0.2252	0.3546
Hospital #2	0.1856	0.2007	0.2627	0.3305
Med Clinic #12	0.1498	0.1133	0.2312	0.2426
Med Clinic #13	0.1397	0.1481	0.1832	0.3258
Med Clinic #14	0.1345	0.1503	0.1731	0.2396
Hospital #3	0.1066	0.1193	0.1193	0.2939
Med Clinic #16	0.0778	0.2009	0.2464	0.3283
Med Clinic #17	0.0478	0.1354	0.1428	0.2454
Hospital #4	0.0075	0.0075	0.0194	0.2994
Med Clinic #19	0.0027	0.0028	0.0729	0.0891

\$5.5M Annual Investment

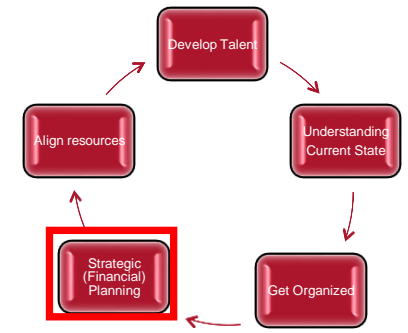
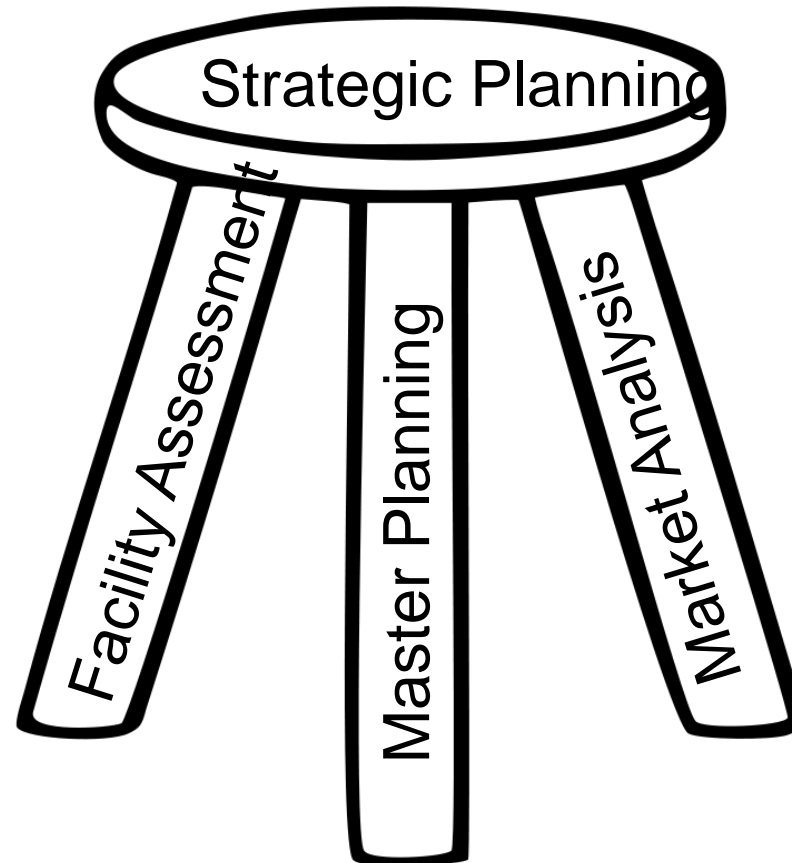
Facility	Priority 1- FCI Years 0-5	Priority 2- FCI Years 6-8	Priority 3- FCI Years 9-10	Priority 4- FCI Years 11-20
Med Clinic #1	0.7143	0.7162	0.7409	0.8438
Med Clinic #2	0.6194	0.6309	0.6577	0.7829
Med Clinic #3	0.3507	0.3563	0.3955	0.4072
Med Clinic #4	0.3391	0.3391	0.3391	0.3527
Med Clinic #5	0.3082	0.3245	0.3441	0.3805
Med Clinic #6	0.2479	0.2837	0.2950	0.3235
Med Clinic #7	0.1796	0.1826	0.4811	0.4862
Med Clinic #8	0.1698	0.1718	0.2245	0.2413
Med Clinic #9	0.1583	0.1764	0.1973	0.2225
Hospital #1	0.1424	0.1520	0.1555	0.1835
Hospital #2	0.1356	0.1415	0.1820	0.1971
Med Clinic #12	0.1042	0.1073	0.1288	0.1412
Med Clinic #13	0.1014	0.1051	0.1287	0.1596
Med Clinic #14	0.0792	0.0812	0.1169	0.1334
Hospital #3	0.0785	0.0830	0.0830	0.1209
Med Clinic #16	0.0573	0.1018	0.1324	0.1501
Med Clinic #17	0.0352	0.0668	0.0718	0.0940
Hospital #4	0.0055	0.0055	0.0135	0.0742
Med Clinic #19	0.0021	0.0021	0.0514	0.0542

\$5.5M Annual Investment

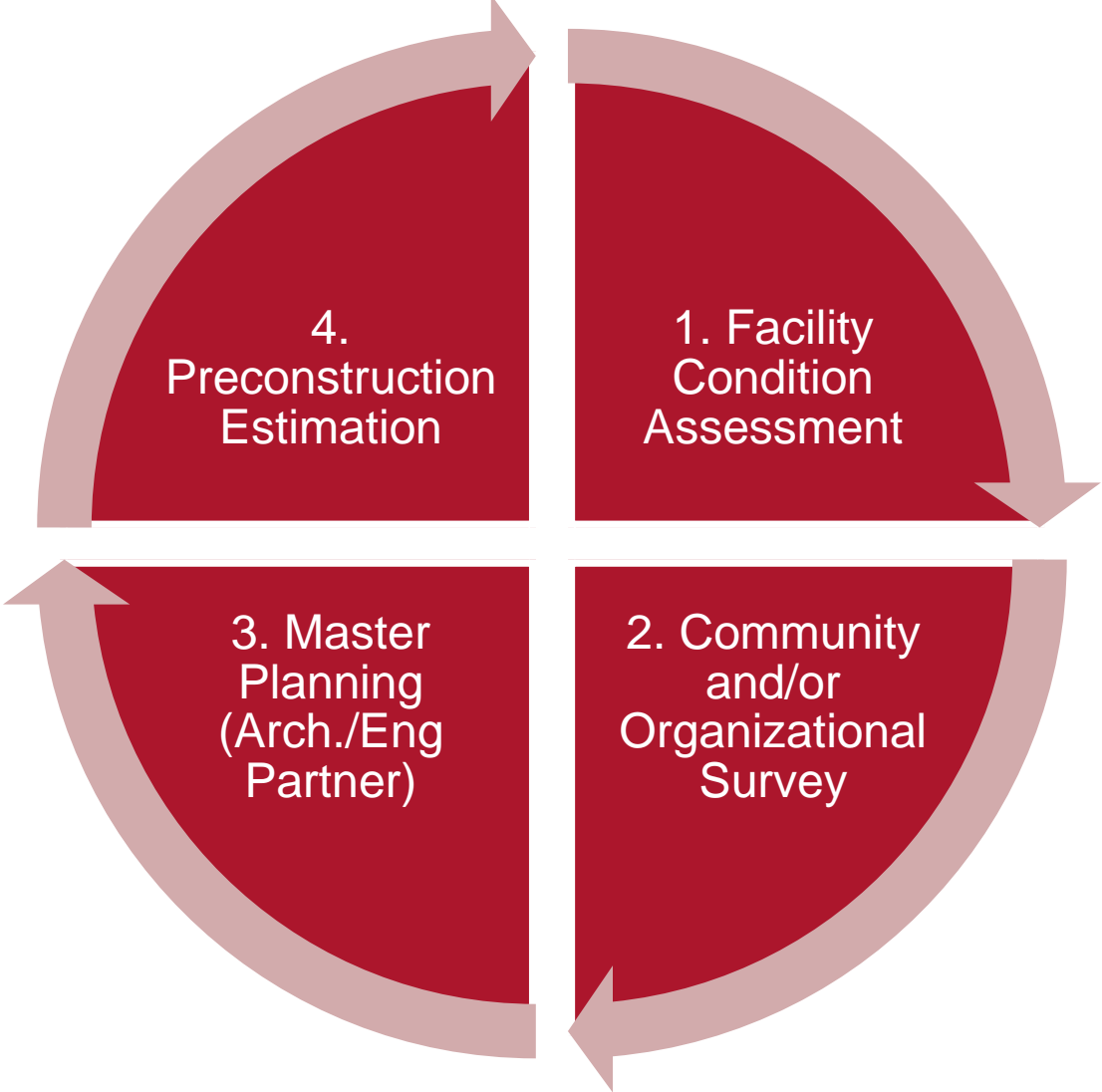
Facility	Priority 1- FCI Years 0-5	Priority 2- FCI Years 6-8	Priority 3- FCI Years 9-10	Priority 4- FCI Years 11-20
Med Clinic #1	0.7143	0.7162	0.7409	0.8438
Med Clinic #2	0.6194	0.6309	0.6577	0.7829
Med Clinic #3	0.3391	0.3391	0.3391	0.3527
Med Clinic #4	0.1918	0.1848	0.1990	0.0191
Med Clinic #5	0.1685	0.1484	0.1554	0.0234
Med Clinic #6	0.1356	0.0913	0.0953	-
Med Clinic #7	0.0982	0.0946	0.1950	0.0182
Med Clinic #8	0.0928	0.0903	0.1093	0.0482
Med Clinic #9	0.0866	0.0641	0.0716	-
Hospital #1	0.0779	0.0660	0.0673	-
Hospital #2	0.0742	0.0668	0.0814	0.0266
Med Clinic #12	0.0570	0.0530	0.0608	0.0156
Med Clinic #13	0.0554	0.0508	0.0593	-
Med Clinic #14	0.0433	0.0408	0.0537	-
Hospital #3	0.0429	0.0372	0.0372	-
Med Clinic #16	0.0313	-	-	-
Med Clinic #17	0.0192	-	-	-
Hospital #4	0.0030	0.0030	0.0059	-
Med Clinic #19	0.0011	0.0011	0.0189	0.0087

\$12.5M Annual Investment

Strategic Planning



Strategic Planning- Phases



Align Resources



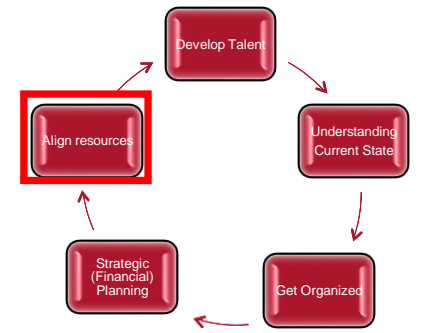
Human Capital



Financial Resources



Facility Resources



Review: Learning Objectives

1. Why?
2. Teach the 5 step methodology
3. Review the IFMA FCA standards and FCI
4. Importance of a long-term facility maintenance plan
5. Identify tools that can be used to improve findings

Recap

- Review the 5-step Methodology
- Review of the Facility Condition Assessment
- Review the importance of the long-term facility maintenance plan

Questions?



QUESTIONS?



A large, dark red L-shaped graphic is positioned on the left side of the slide, consisting of a vertical bar and a horizontal bar that meet at a right angle. A second, smaller dark red L-shaped graphic is positioned on the right side of the slide, also consisting of a vertical bar and a horizontal bar meeting at a right angle. The text "THANK YOU!" is centered between these two L-shaped elements.

THANK YOU!