

# Capital Analysis & Planning

WARRIOR STRONG



WAYNE STATE  
UNIVERSITY

# Capital Planning: Executive Summary

In 2018, Sightlines (now Gordian) reported \$1.2b in capital needs to address deferred maintenance across campus.

After a thorough review of the 2018 report, we found significant assumptions and contingencies within their plan.

In an effort to have a truly accurate understanding of our capital needs, we re-directed Gordian in 2020 to produce a Facilities Condition Index (FCI) score for campus.

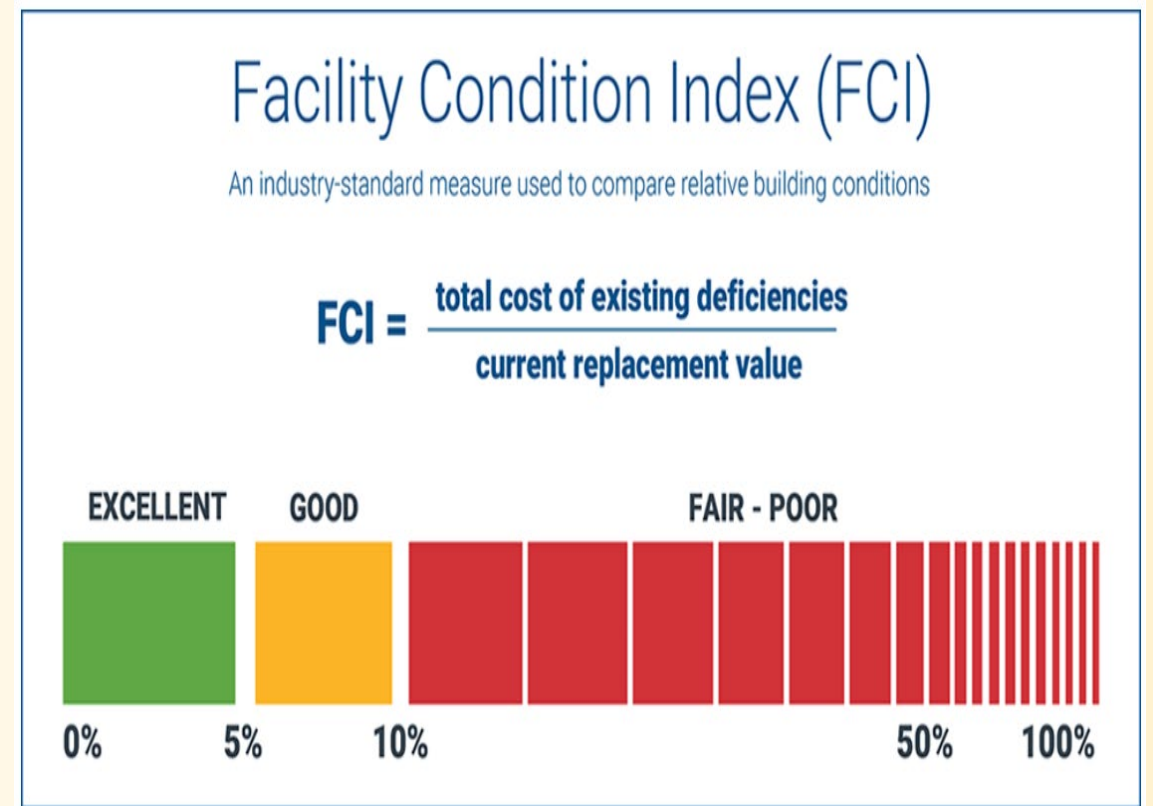
The FCI score is an industry standard means of determining the capital needs of a build environment.



# Capital Planning: Facility Condition Index (FCI)

Developing an FCI score takes many months (perhaps years depending on the size of the portfolio) and includes the following tasks:

- Field survey of all assets
- Categorizing assets in the following manner:
  - MEP (mechanical, electrical & plumbing)
  - Building envelope (windows, doors, exterior skin & roofs)
  - Elevator portfolio
  - Interior finishes
- Determine the age, condition and critical nature of all assets
- Assign scores to each asset
- Develop pricing associated with replacing assets
- **With more than \$3b in replacement value and \$436m in total capital deficiencies, our FCI score is 13%**



**Our FCI Score is 13% - 15%**



# Capital Planning: Deferred Maintenance & Capital Renewal

Capital Timing Overview	Total Capital Need
Backlog (immediate need)	\$ 168,559,826.62
A (1-3 Years)	\$ 76,599,028.42
B (4-7 Years)	\$ 133,365,123.17
C (8-10 Years)	\$ 57,933,639.39
<b>Grand Total</b>	<b>\$ 436,457,617.61</b>

MEP and fire/life safety systems represent the most important aspects of building comfort, safety and reliability.

Our focus is on the following backlogs:

- \$104m Mechanical/Elect/Plumbing
- \$7m Building Envelope
- \$3m+ Elevator Modernization
- **\$114M Total Deferred Maintenance**

Category	Backlog	A (1-3 Years)	B (4-7 Years)	C (8-10 Years)	Grand Total
D20 - Plumbing	\$ 27,728,503.69	\$12,609,111.46	\$13,533,011.73	\$ 8,289,756.65	\$ 62,160,383.53
D30 - HVAC	\$ 53,442,928.20	\$ 7,652,035.60	\$25,260,915.24	\$25,195,470.50	\$ 111,551,349.54
D40 - Fire Protection	\$ 123,783.62	\$ 85,022.42	\$ 136,283.62	\$ 48,761.21	\$ 393,850.87
D50 - Electrical	\$ 23,173,285.88	\$ 2,460,832.99	\$ 8,697,771.62	\$ 7,024,731.93	\$ 41,356,622.40
<b>Grand Total</b>	<b>\$ 104,468,501.38</b>	<b>\$ 22,807,002.46</b>	<b>\$ 47,627,982.21</b>	<b>\$ 40,558,720.29</b>	<b>\$ 215,462,206.34</b>

Category	Backlog	A (1-3 Years)	B (4-7 Years)	C (8-10 Years)	Grand Total
B - Shell	\$ 7,514,259.37	\$ 25,948,738.85	\$ 49,340,484.19	\$ 8,025,294.21	\$ 90,828,776.61
C - Interiors	\$ 53,827,065.87	\$ 27,830,509.24	\$ 36,389,411.12	\$ 9,037,412.62	\$ 127,084,398.85
E - Elevators	\$ 2,750,000.00			\$ 309,132.87	\$ 3,059,132.87
G - Building Sitework		\$ 12,777.88	\$ 7,245.65	\$ 3,079.40	\$ 23,102.93
<b>Grand Total</b>	<b>\$ 64,091,325.24</b>	<b>\$ 53,792,025.96</b>	<b>\$ 85,737,140.96</b>	<b>\$ 17,374,919.10</b>	<b>\$ 220,995,411.27</b>



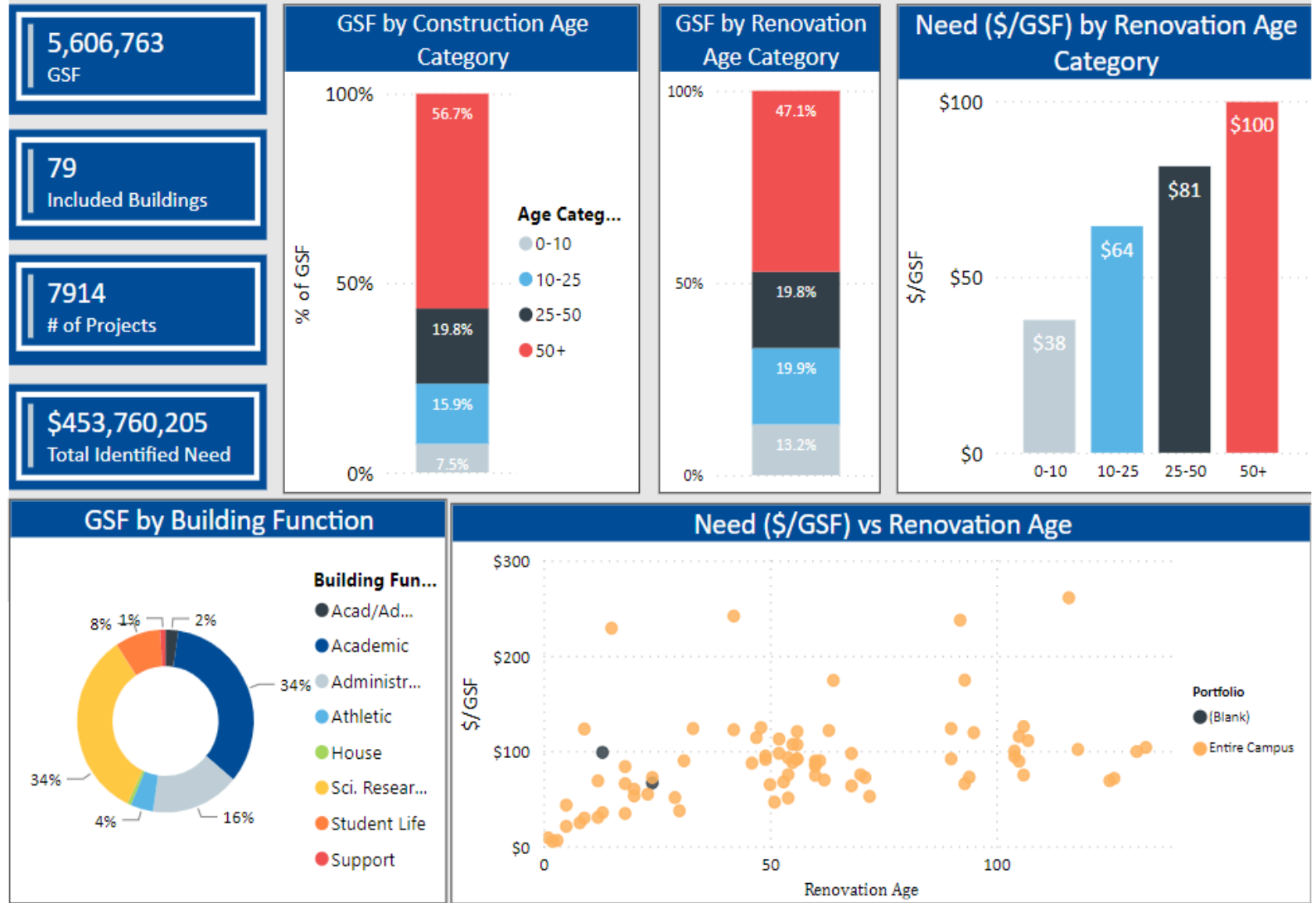
# Capital Planning: Gordian's Interactive Dashboard

We now have access to an interactive database that holds our complete asset inventory – over 10,000 items.

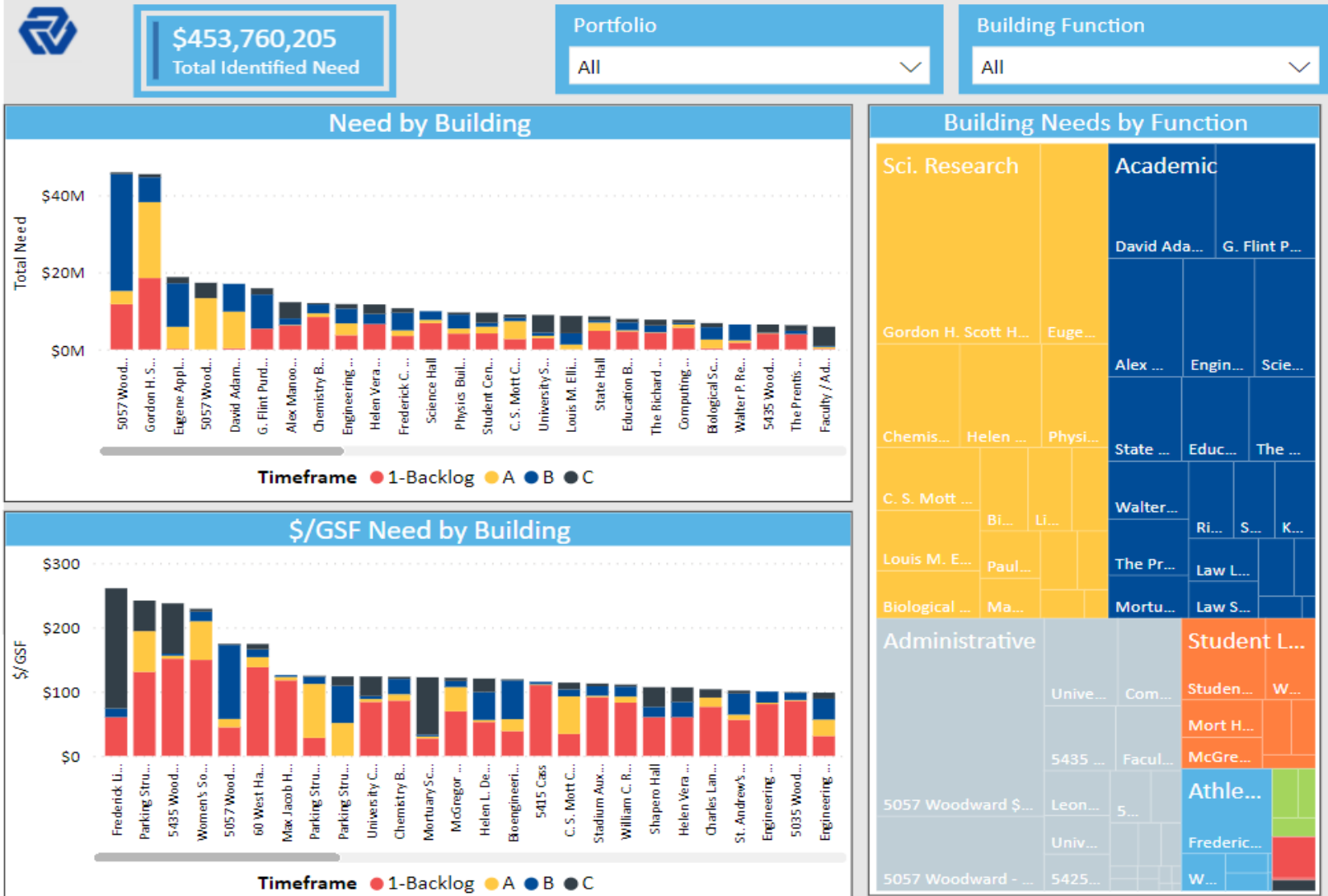
This database is malleable and will remain accurate as we add and retire assets.

Capital planning, both short and long term, is now available instantly at any moment.

Among other bits of information noted on this dashboard is the age of our built environment. More than 50% of our buildings are greater than 50 years old.



# Capital Planning: Needs by Building



Here is another view of the many dashboards available to us.

Noteworthy on this dashboard is the graph on the top left – monetary need by building.

Not surprisingly, Macabees and Scott Hall represent buildings requiring the greatest needs on campus.



# Capital Planning: Top 10 Buildings - Greatest Monetary Needs

Building Name	Building Age	GSF	Repl. Value	Total 10-Year Need	10-Year Need \$/GSF	FCI - Total 10 Year Need / Repl. Value
Macabees 5057 Woodward	93	288,419	\$ 147,010,326	\$ 45,925,434	\$ 159	31%
Gordon H. Scott Hall of Basic Medical Science	49	498,183	\$ 315,440,423	\$ 45,460,724	\$ 91	14%
Eugene Applebaum Pharmacy and Health Sciences Building	18	285,258	\$ 242,546,932	\$ 18,764,821	\$ 66	8%
David Adamany Undergraduate Library	23	310,965	\$ 137,827,843	\$ 17,009,671	\$ 55	12%
G. Flint Purdy Library	68	162,770	\$ 72,144,139	\$ 15,864,703	\$ 97	22%
Alex Manoogian Hall (Heritage Rooms)	50	189,150	\$ 83,836,235	\$ 12,262,380	\$ 65	15%
Chemistry Building	9	228,910	\$ 144,941,536	\$ 11,994,205	\$ 52	8%
Engineering Building (Engineering Development Center)	13	265,740	\$ 223,547,560	\$ 11,760,327	\$ 44	5%
Helen Vera Prentis Lande Building	56	109,435	\$ 61,472,219	\$ 11,678,006	\$ 107	19%
Frederick C. Matthaehi Physical Education Center	53	157,841	\$ 74,242,622	\$ 10,671,546	\$ 68	14%



# Capital Planning: Top 10 Buildings - Least Monetary Needs

Building Name	Building Age	GSF	Repl. Value	Total 10-Year Need	10-Year Need \$/GSF	FCI - Total 10 Year Need / Repl. Value
I2C Building	1	45,687	\$ 20,249,708	\$ 409,334	\$ 9	2%
Parking Structure #4 (School of Medicine Parking)	42	1,561	\$ 536,603	\$ 377,438	\$ 242	70%
Parking Structure #8 (South University Village Parking)	12	11,607	\$ 3,989,670	\$ 353,298	\$ 30	9%
6000 Cass (Westinghouse Building)	94	4,000	\$ 1,230,258	\$ 290,310	\$ 73	24%
Parking Structure #1	54	2,441	\$ 838,917	\$ 226,928	\$ 93	27%
Women's Softball Locker Room Facility & Stadium	15	4,915	\$ 1,778,494	\$ 224,075	\$ 46	13%
Parking Structure #2	48	1,146	\$ 393,842	\$ 142,861	\$ 125	36%
WDET Transmitter	24	1,883	\$ 510,953	\$ 125,516	\$ 67	25%
Parking Structure #5	33	746	\$ 256,537	\$ 92,308	\$ 124	36%
Harwell Field	3	2,828	\$ 1,023,246	\$ 17,481	\$ 6	2%





# Macabees 5057: Behind the \$46m

Categories	Backlog	A (1-3 Years)	B (4-7 Years)	C (8-10 Years)	Grand Total
<b>B - Shell</b>	\$ 546,769.97		\$ 23,269,467.61		\$ 23,816,237.58
B20 - Exterior Enclosure	\$ 546,769.97		\$ 23,144,844.54		\$ 23,691,614.51
B30 - Roofing			\$ 124,623.07		\$ 124,623.07
<b>C - Interiors</b>	\$ 486,832.19	\$ 1,767,763.99	\$ 5,667,562.60		\$ 7,922,158.78
C30 - Interior Finishes	\$ 486,832.19	\$ 1,767,763.99	\$ 5,667,562.60		\$ 7,922,158.78
<b>D - Services</b>	\$ 10,709,402.10	\$ 1,661,749.36	\$ 1,368,000.00	\$ 438,753.14	\$ 14,177,904.60
D20 - Plumbing	\$ 2,350,717.69		\$ 1,368,000.00	\$ 36,000.00	\$ 3,754,717.69
D30 - HVAC	\$ 3,172,722.64	\$ 1,661,749.36		\$ 289,492.12	\$ 5,123,964.12
D50 - Electrical	\$ 5,185,961.77			\$ 113,261.02	\$ 5,299,222.79
<b>E - Equipment &amp; Furnishings</b>				\$ 9,132.87	\$ 9,132.87
E10 - Equipment				\$ 9,132.87	\$ 9,132.87
<b>Grand Total</b>	\$ 11,743,004.27	\$ 3,429,513.35	\$ 30,305,030.21	\$ 447,886.01	\$ 45,925,433.83

## Immediate Needs

- Electrical Infrastructure \$5m
  - HVAC \$3m
  - Plumbing \$2m
  - Building Envelope \$0.5m
- \$10.5m**

## Long-Term Needs

- Building Envelope \$24m
  - HVAC \$2m
  - Plumbing \$1.5m
  - Interiors \$8m
- \$35.5m**



# Scott Hall: Behind the \$45m

Categories	Backlog	A (1-3 Years)	B (4-7 Years)	C (8-10 Years)	Grand Total
<b>B - Shell</b>		<b>\$ 12,547,677.26</b>			<b>\$ 12,547,677.26</b>
B20 - Exterior Enclosure		\$ 12,539,464.42			\$ 12,539,464.42
B30 - Roofing		\$ 8,212.84			\$ 8,212.84
<b>C - Interiors</b>	<b>\$ 7,379,868.01</b>	<b>\$ 2,396,930.35</b>	<b>\$ 5,240,643.44</b>		<b>\$ 15,017,441.79</b>
C30 - Interior Finishes	\$ 7,379,868.01	\$ 2,396,930.35	\$ 5,240,643.44		\$ 15,017,441.79
<b>D - Services</b>	<b>\$ 11,138,214.89</b>	<b>\$ 4,749,133.80</b>	<b>\$ 1,189,121.27</b>	<b>\$ 812,341.72</b>	<b>\$ 17,888,811.68</b>
D20 - Plumbing	\$ 91,035.85	\$ 4,749,133.80	\$ 28,678.62	\$ 85,250.00	\$ 4,954,098.26
D30 - HVAC	\$ 11,012,918.02		\$ 1,157,942.66	\$ 494,810.86	\$ 12,665,671.54
D40 - Fire Protection			\$ 2,500.00		\$ 2,500.00
D50 - Electrical	\$ 34,261.02			\$ 232,280.86	\$ 266,541.88
<b>G - Building Sitework</b>		<b>\$ 6,792.80</b>			<b>\$ 6,792.80</b>
G20 - Site Improvements		\$ 6,792.80			\$ 6,792.80
<b>Grand Total</b>	<b>\$ 18,518,082.89</b>	<b>\$ 19,700,534.20</b>	<b>\$ 6,429,764.71</b>	<b>\$ 812,341.72</b>	<b>\$ 45,460,723.53</b>

## Immediate Needs

- Electrical Infrastructure \$34k
  - HVAC \$11m
  - Plumbing \$91k
- \$12.5m**

## Long-Term Needs

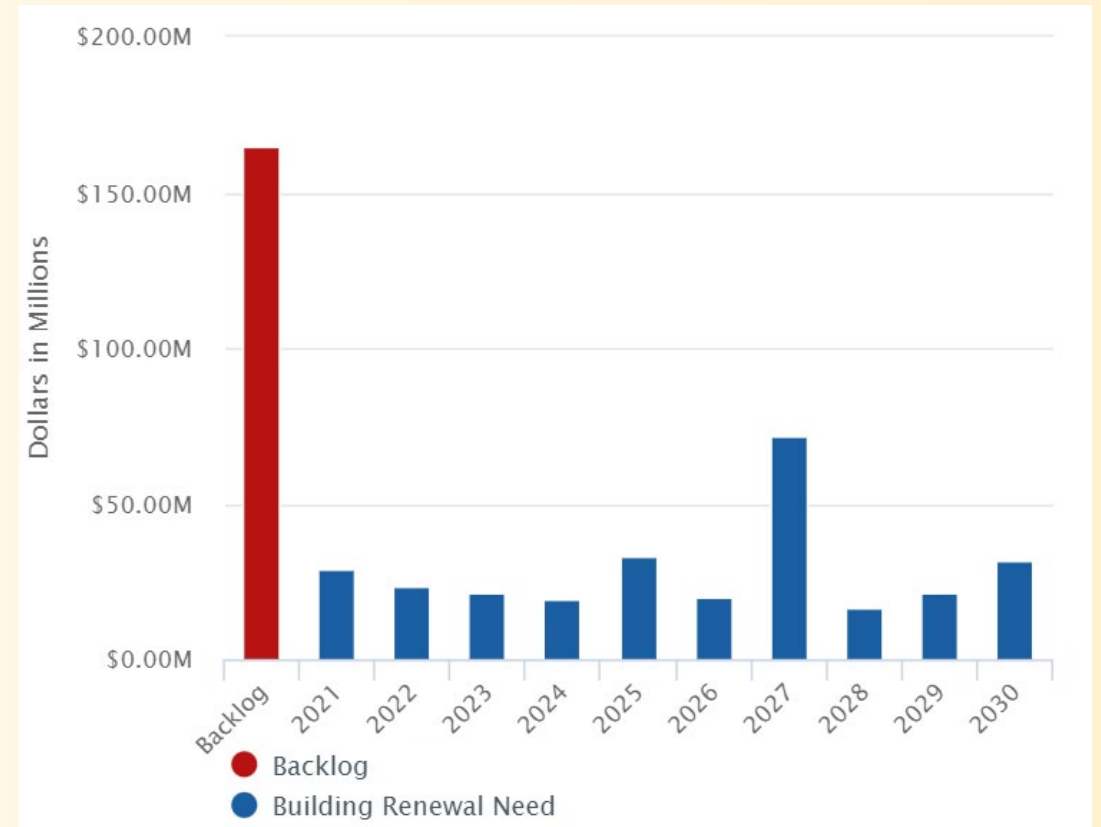
- Building Envelope \$13m
  - Plumbing \$5m
  - Interiors \$15m
- \$32m**



# Deferred Maintenance Strategy

In an effort to bring order and clarity to our deferred maintenance we will focus our attention on buildings with the following attributes:

- Immediate mechanical, electrical and plumbing (MEP) needs
- Roof replacements
- Elevators modernizations
- Building envelope
  - Water infiltration issues
- Structural concerns
  - Parking structures
  - Below grade water infiltration
- Emergency items which become critical in nature



# 2022 Capital Plan: Projects in the Pipeline

BUILDING	PROJECT BUDGET	PROJECT TYPE	DESCRIPTION
Mort Harris Fitness Center	\$100,000	Bldg Envelope	South elevation glazing sealant replacement (Required element never installed)
Kresge Library	\$107,784	Roof	Current market pricing estimates
Scott Hall	\$123,000	MEP	Scott Hall Generator Repairs and Upgrades
Mortuary Science Building	\$150,000	Bldg Envelope	Water Intrusion Issues
Stadium Auxiliary Building	\$175,000	MEP	Rooftop unit replacement for five package units past useful life
Student Center	\$180,000	Bldg Envelope	Full exterior control joints, window caulking,
Community Arts	\$207,864	Roof	Current market pricing estimates
Purdy Library	\$229,624	Roof	Current market pricing estimates
Science Hall	\$250,000	MEP	Makeup air unit (Adjust for reduced fume hood capacity)
AAB	\$266,896	Roof	Current market pricing estimates
Computer Service Center	\$325,000	Elevator	Elevator modernization to machine room-less system
General Lectures	\$420,000	MEP	Replacement of fire alarm system
Prentis Building	\$500,000	Bldg Envelope	Repair water intrusion issues related to the DeRoy reflecting pool
Science Hall	\$625,000	Elevator	Elevator modernization (passenger elevator)
Parking Structure #5	\$900,000	Parking (Structures & Lots)	Concrete/structural repairs, non-structural system repairs
Parking Structure #6	\$1,000,000	Elevator	Replace two elevators and enclose all lobbies (carryover from FY20)
Biological Sciences	\$2,200,000	MEP	HVAC Controls Upgrade
Art Building	\$3,000,000	Elevator	Modernize existing and add stop at 4th floor
<b>Total</b>	<b>\$10,911,568</b>		



# Cost of Waiting National Statistics

## Turner Construction National Analysis

- Suggests a YOY market increase of 4.5%
- A project valued at \$100,000 in 2021 may see an \$18,000 increase in just three years (graph below)
- Turner Building Cost Index (graph on right) is illustrating an actual 3% increase in materials and labor
- Supply chain disruptions continue to impact lead times for construction materials

### FORECAST INDEX CHANGES - CONSTRUCTION MARKET ESCALATION

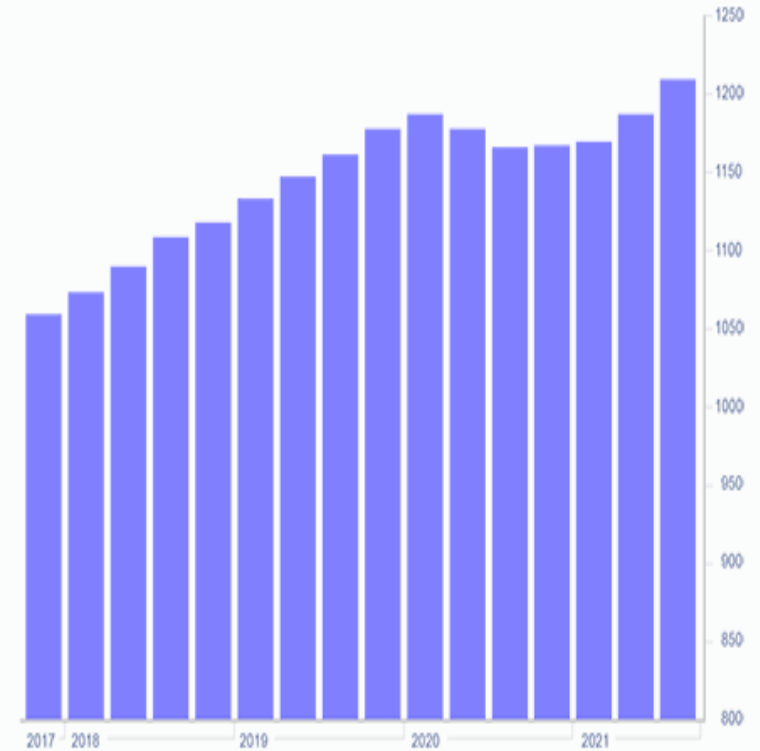
YEAR	%Change	Future Project Costs (example; \$100,000 in 2021)
2022	4.45	\$104,450.00
2023	8.9	\$108,900.00
2024	13.35	\$113,350.00
2025	17.8	\$117,800.00
2026	22.25	\$122,250.00

October 25, 2021

According to Turner Construction Company's quarterly Building Cost Index, increased costs for construction materials and skilled labor shortage are expected to continue during the Third Quarter 2021

"While supply chain disruptions continue to impact lead times for key construction materials such as steel, aluminum, and copper, there was also a significant reduction in lumber costs. At the same time, we experienced some vendors and subcontractors reporting that their backlog is returning to pre-pandemic levels. Overall the results continue to indicate increased costs as well as reduce the vendor/subcontractor market's ability to provide longer pricing commitments for current projects."

Attilio Rivetti  
Vice President



# Cost of Waiting Local Statistics

## The Christman Company Local Analysis

Interestingly, the Detroit Building Cost Index shows prices are up, on average, 10.2% in the past year in Detroit

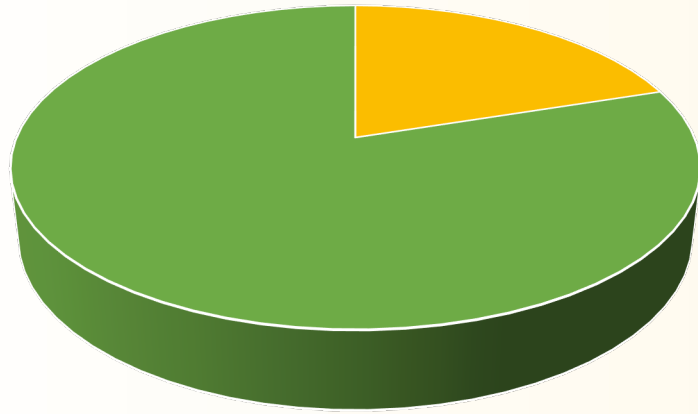
Actual 2021 monthly trends are noted to the right

Should this trend continue, we could expect to pay an additional \$30,000 in 2024 for a project valued at \$100,000 today

YEAR	MONTH	BCI	%CHG
2021	November	7156.87	+10.2
2021	October	7211.41	+11.9%
2021	September	7279.36	+14.1
2021	August	7346.84	+15.9
2021	July	7195.49	+13.3
2021	June	7041.16	+11.3
2021	May	6915.18	+9.1
2021	April	6798.44	+6.7
2021	March	6701.56	+5.6
2021	Feb	6632.01	+4.5
2021	Jan	6574.08	+3.5
2020	Dec	6543.80	+2.0
2020	Nov	6492.24	1.3%



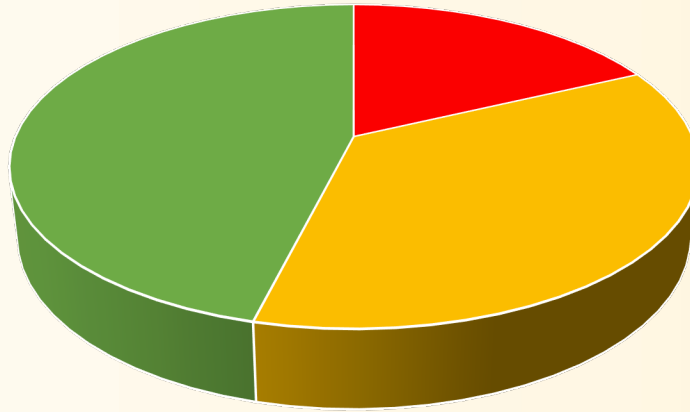
# Analysis: Preventative Maintenance Programs Eliminate Deferred Maintenance



■ DM ■ RM ■ PM

**80% Scheduled**

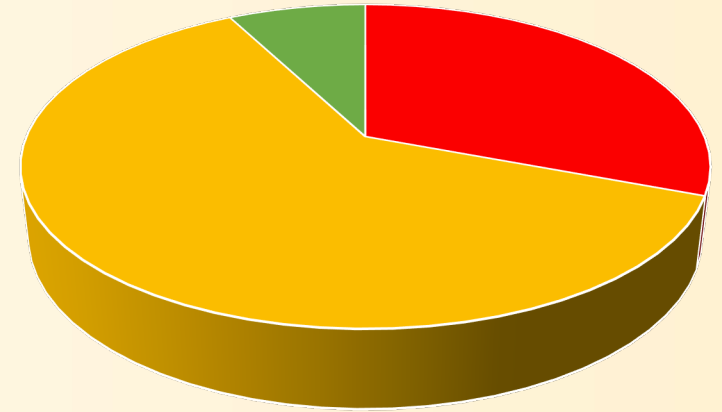
**Preventative Maintenance**



■ DM ■ RM ■ PM

**70% Scheduled**

**Preventative Maintenance**



■ DM ■ RM ■ PM

**10% Scheduled**

**Preventative Maintenance**

**\$1 to \$2.73**

Estimated relationship of investment in preventive maintenance and avoided future reactive maintenance costs

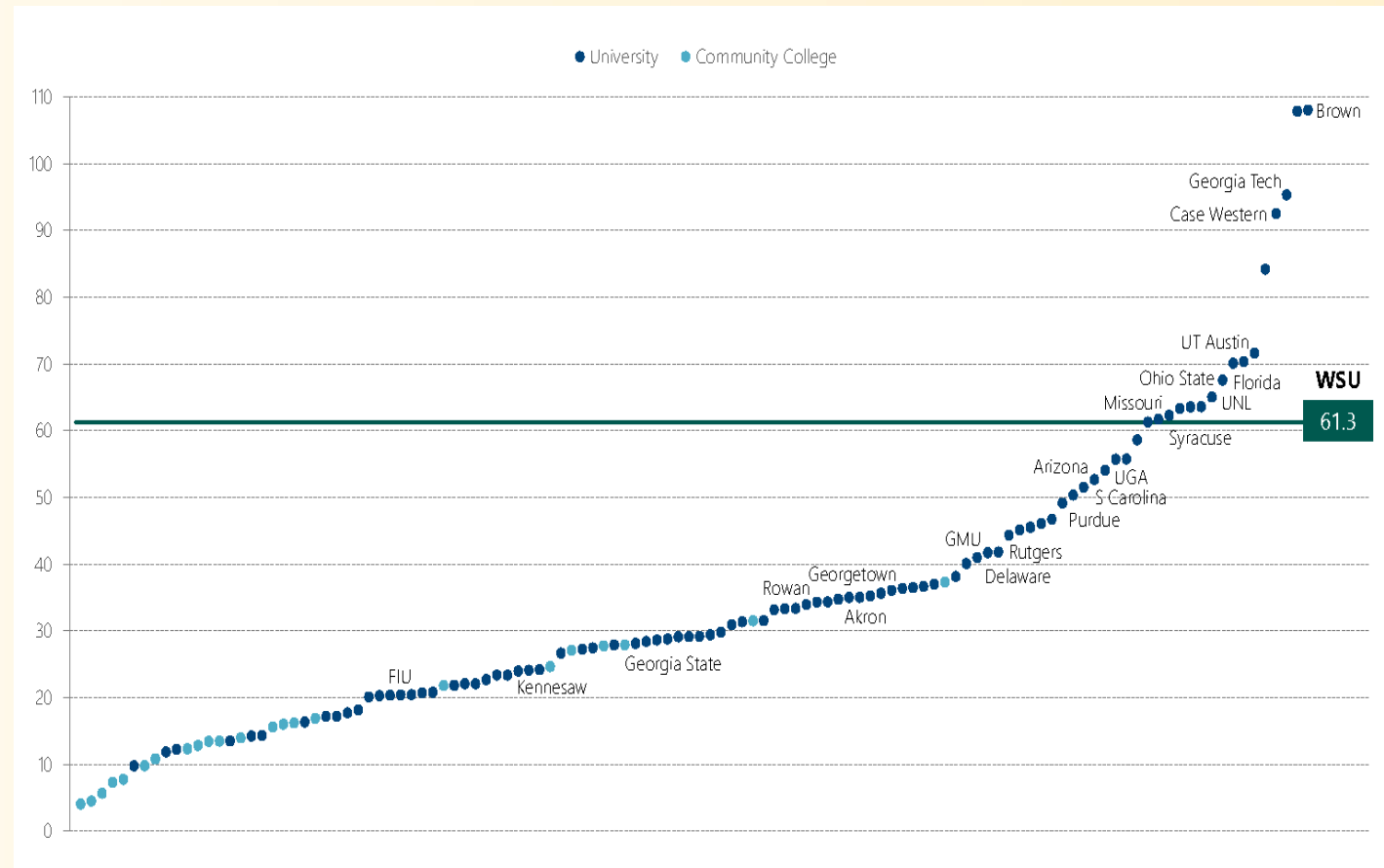
DM = Deferred Maintenance  
RM = Reactive Maintenance  
PM = Preventative Maintenance

\*\* Source: Sightlines, "The State of Facilities in Higher Education: An In-Depth Look at the 2015 Trends and Best Practices," <http://www.sightlines.com/insight/2015-state-of-facilities-in-higher-education-webinar/>; Rose R, *Charting a New Course for Campus Renewal*, Alexandria, VA: APPA, 1999; EAB interviews and analysis.



# Master Plan Implementation: Office Consolidation

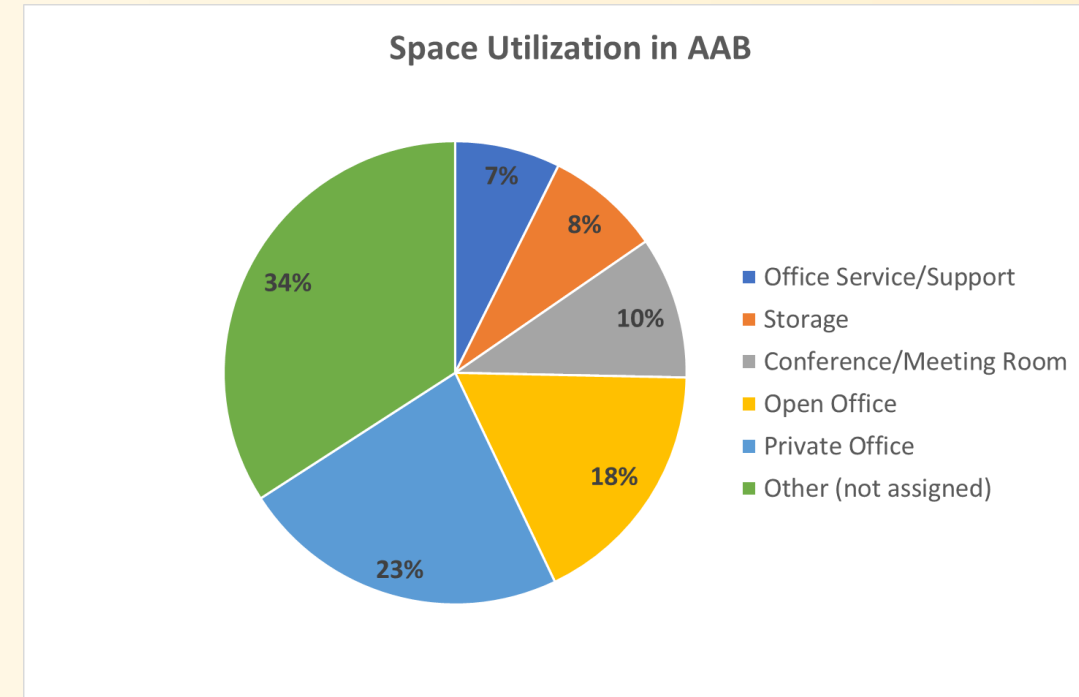
- One of the key physical strategies in the Wayne Framework is to “concentrate academic activity in an enhanced core”
- Suggestions included:
  - Moving administrative functions from buildings such as FAB and AAB into 5057 Woodward (Maccabees)
  - Strategically eliminating underperforming square footage
- When benchmarking WSU against peer institutions on the basis of assignable square feet of office space per student full time equivalent, WSU lies on the higher end of the distribution (see chart to the right)





# Master Plan Implementation: Office Consolidation

- Average size for private offices across campus and administrative units is approximately 85 square feet to almost 180 square feet per person
  - **Typical targets are between 100 and 120 square feet**
- For shared work spaces, unit averages vary from ~25 to ~175 square feet per person
  - **Targets are between 60 and 85 square feet**

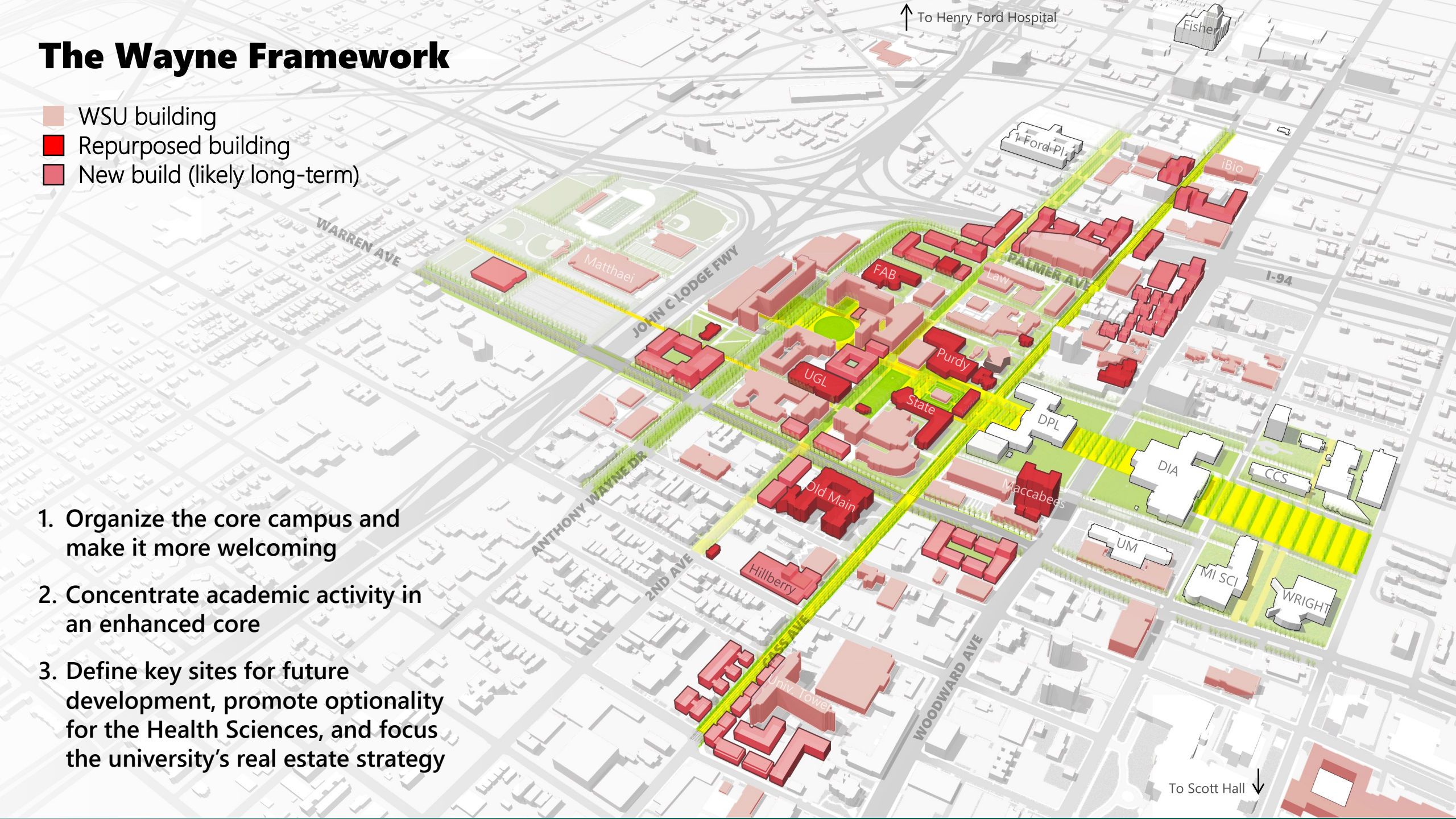


*\*Data from 2018/2019 office space survey*

# The Wayne Framework

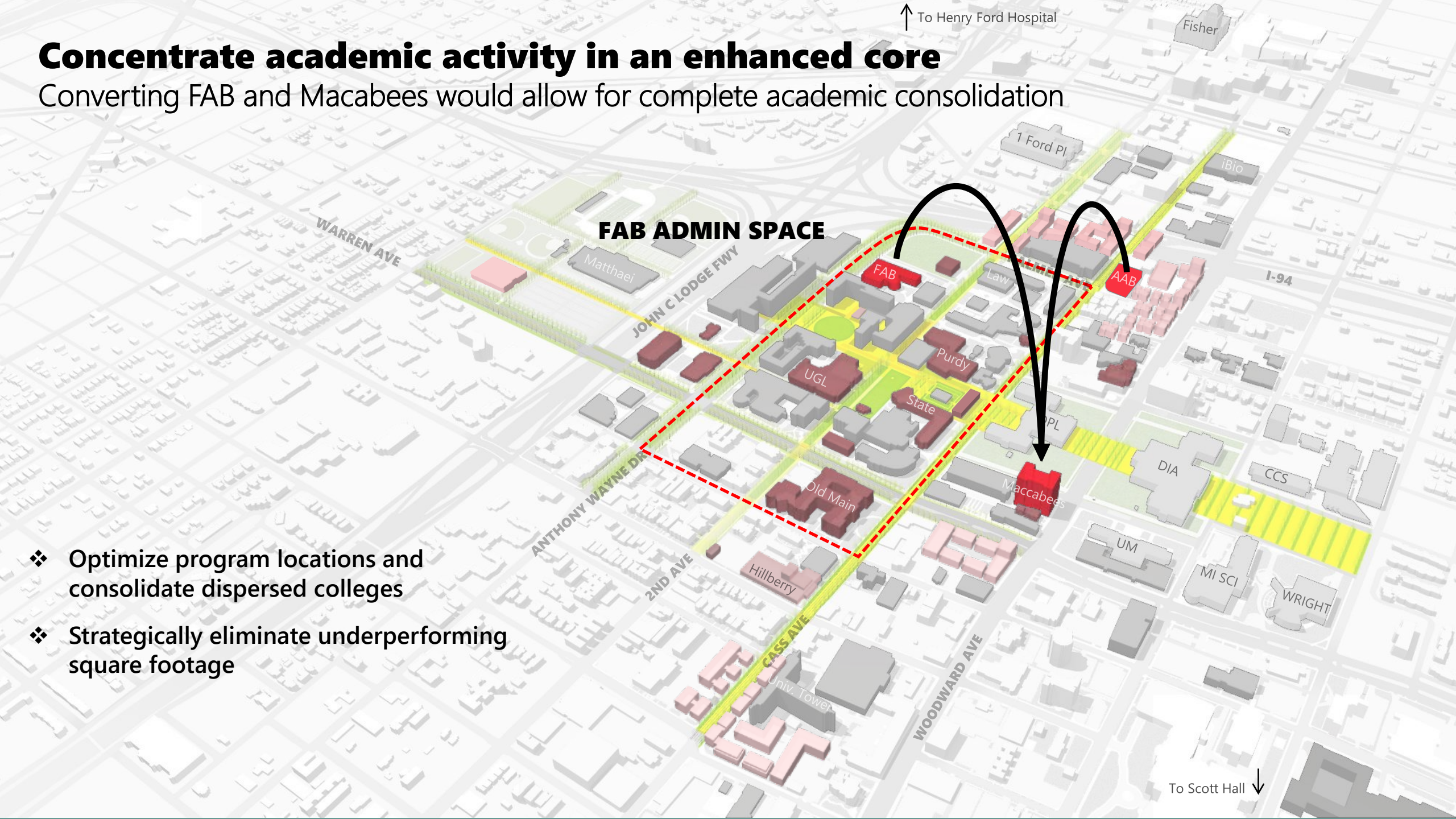
- WSU building
- Repurposed building
- New build (likely long-term)

1. Organize the core campus and make it more welcoming
2. Concentrate academic activity in an enhanced core
3. Define key sites for future development, promote optionality for the Health Sciences, and focus the university's real estate strategy



# Concentrate academic activity in an enhanced core

Converting FAB and Macabees would allow for complete academic consolidation



## FAB ADMIN SPACE

- ❖ Optimize program locations and consolidate dispersed colleges
- ❖ Strategically eliminate underperforming square footage

To Scott Hall ↓

# Consolidation & Right-Sizing

- WSU building
- Repurposed building
- New build (likely long-term)
- Potential candidates for demo

- ❖ Consolidate Custodial/Grounds into existing USB building
- ❖ Identify buildings which may qualify for a model to demo
- ❖ Reallocate operating expenses associated with vacant buildings to the deferred maintenance budget

