
Deferred Maintenance Self-assessment



An Application to Public Private Ventures

The University of Georgia
Office of the University Architects for Facilities Planning

Framework

- Deferred Maintenance Funding
- Lifecycle Approach
- Building Subsystems
- Subsystem Lifecycles
- Assessment of Individual Buildings and Subsystems at South Campus
- Subsystem Renewal and Replacement Cost vs New Building



Coverdell Research Center
University of Georgia

Considering Lifecycles

- Aging, use, natural causes and deferred maintenance backlog increase chances of expensive breakdowns in building subsystems.
- Subsystem lifecycles are taken into account to provide effective tools for evaluating future renewal.



Coverdell Research Center
University of Georgia

Biological Science



- Stanford Approach:
% of Current Replacement Value (CRV) set aside annually for future renewal (current+future renewal taken into account)

Deferred Maintenance Funding

Subsystem Lifecycles

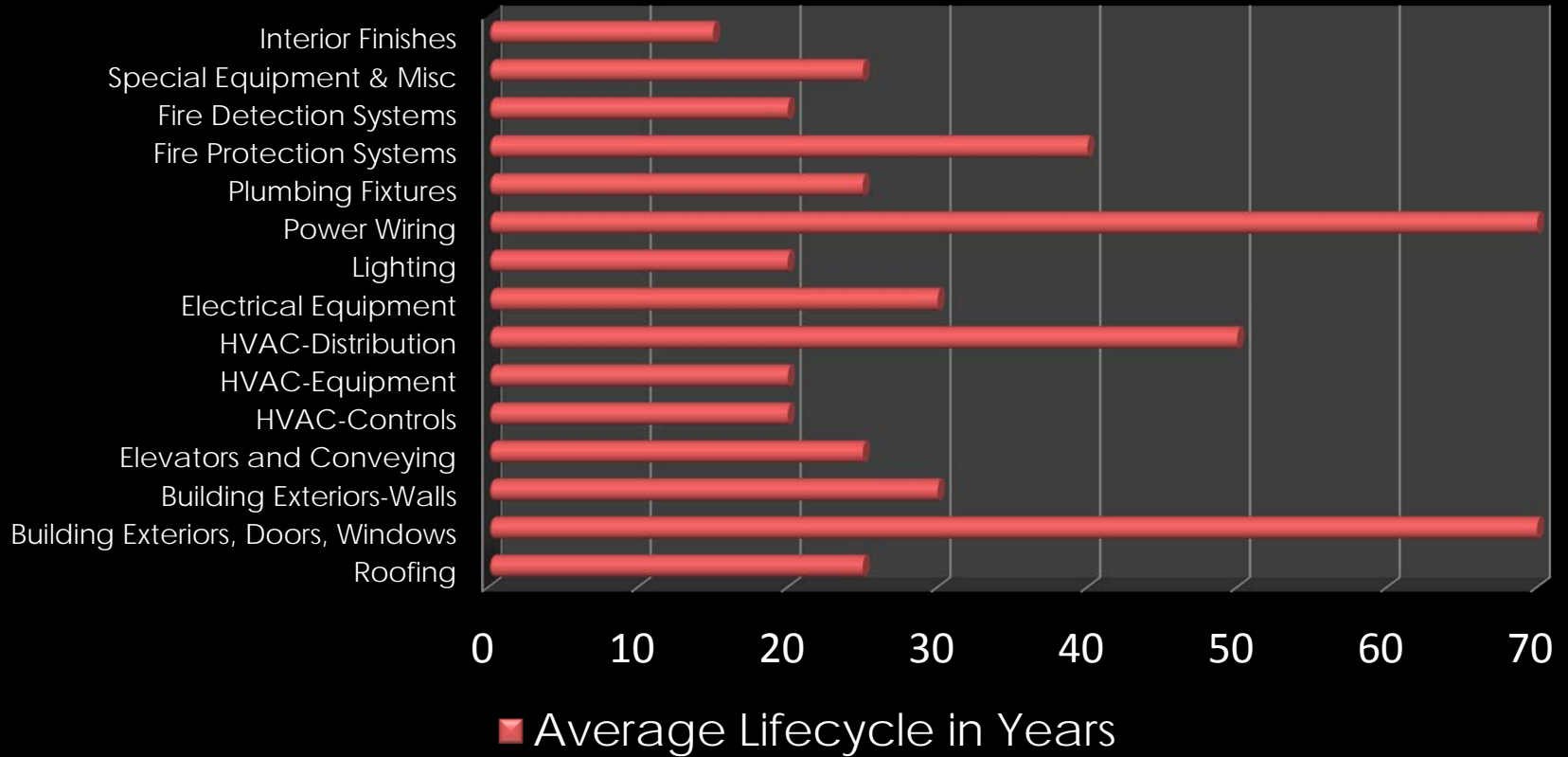
- Average building subsystem (i.e. HVAC, plumbing, exteriors) has a lifecycle between 20 and 50 years.

Rockefeller Institute of Government.



Driftmier Engineering
University of Georgia

Stanford University Subsystem Lifecycle Study



At The University of Georgia



Hardman Hall
University of Georgia

- Declining resources contribute to decreased funding for renewal of facilities.
- Models suggest that 1.5-2.6% of the CRV should be reinvested annually to be used for renewal.

- Flexibility of method permits evaluation of future maintenance before monetary commitments are made.
- Monies are budgeted annually for sub system maintenance and renewal. Therefore critical and expensive sub system failures are avoided.

Hardman Hall



At The University of Georgia

South Campus at UGA

- 2012 preliminary data suggests many subsystems of South Campus buildings are approaching the end of their projected life cycles.



Warnell School of Forestry
University of Georgia

- Are some subsystems worth repairing?
- Would it be more cost-effective to consider replacement based on lifecycle analyses?
- Does the building meet the needs of it' users?

D.W. Brooks Mall
University of Georgia



South Campus at UGA



- 1901-1939
- 1940-1959
- 1960-1969
- 1970-2009

South Campus Buildings by Decade

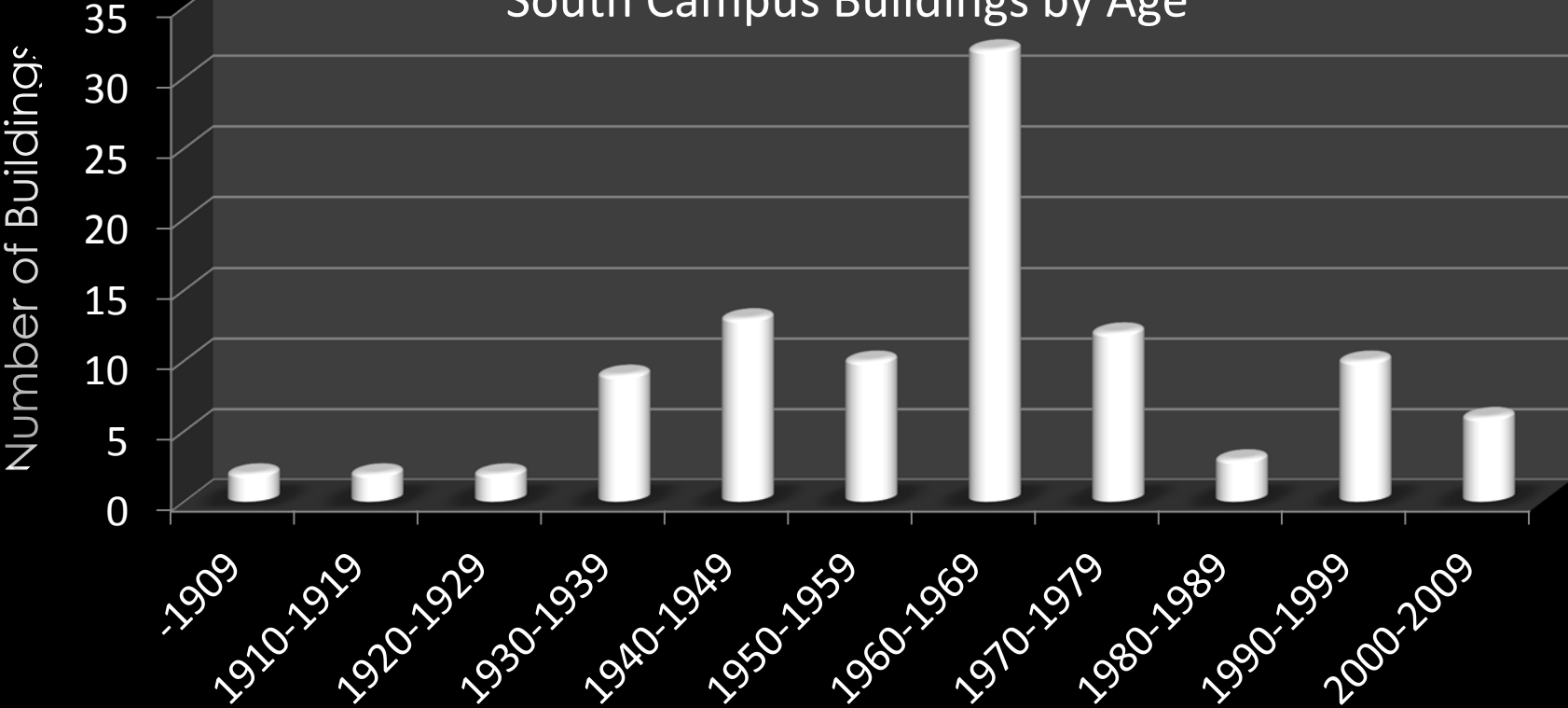
Pharmacy
University of Georgia

- Continued growth and aging facilities create the need for a planned maintenance and renewal approach to South Campus.



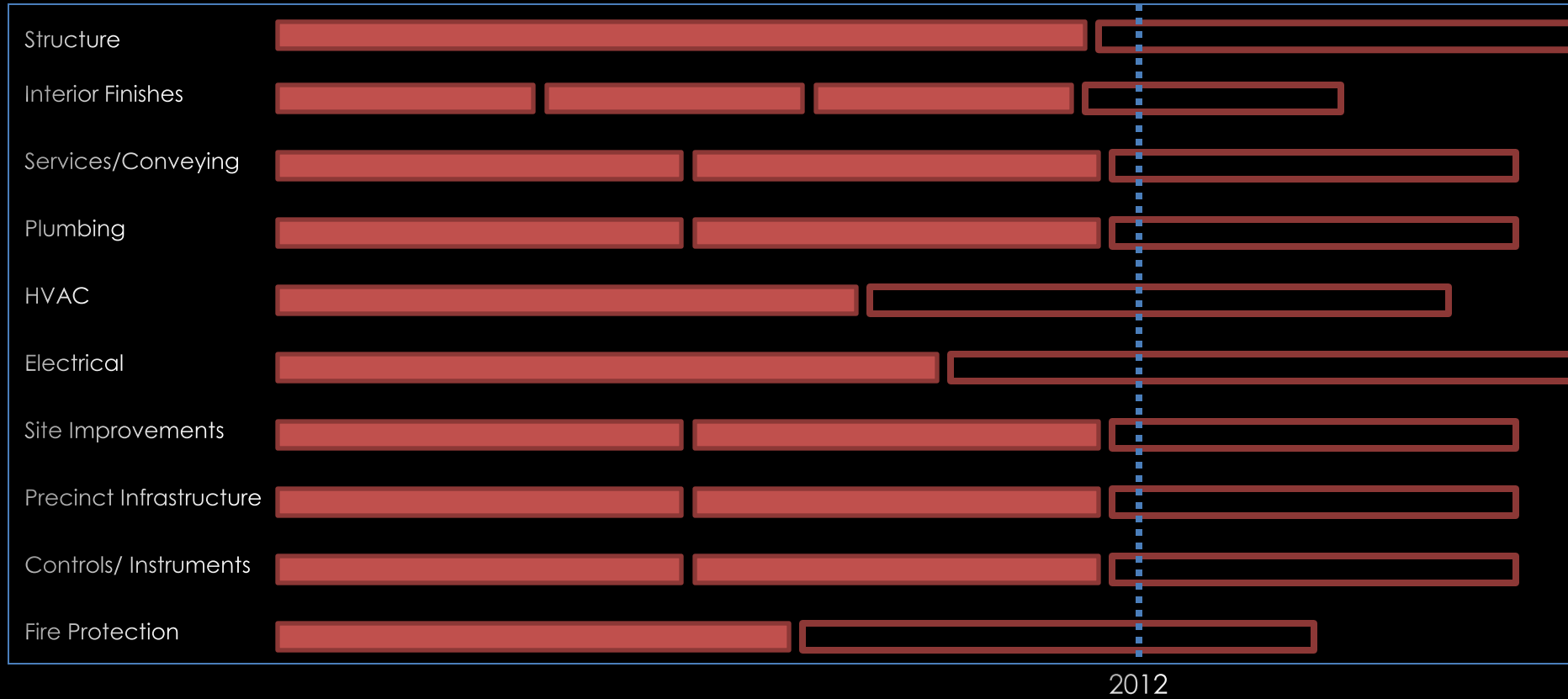
South Campus at UGA

South Campus Buildings by Age



Science Hill Buildings Subsystem Lifecycle Study

1960 1965 1970 1980 1975 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030



SOUTH CAMPUS PRECINT BUILDING CONDITIONS*

Building Name: _____

Date: _____

Building Number: _____

Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements	Ratings (1 to 5)				
			1 (Fail)	2 (Poor)	3 (Average)	4 (Good)	5 (New)
A SUBSTRUCTURE	A10 Foundations	A1010 Standard Foundations					
		A1020 Special Foundations					
		A1030 Slab on Grade					
	A20 Basement Construction	A2010 Basement Excavation					
		A2020 Basement Walls					
		A2030 Basement Floors					
B SHELL	B10 Super Structure	B1010 Floor Construction					
		B1020 Roof Construction					
		B1030 Exterior Walls					
	B20 Exterior Enclosure	B2010 Exterior Walls					
		B2020 Exterior Windows					
		B2030 Exterior Doors					
C INTERIORS	C10 Interior Construction	C1010 Partitions					
		C1020 Interior Doors					
		C1030 Fittings					
	C20 Stairs	C2010 Stair Construction					
		C2020 Stair Finishes					
	C30 Interior Finishes	C3010 Wall Finishes					
		C3020 Floor Finishes					
		C3030 Ceiling Finishes					
		C3040 Other Interior Finishes					
D SERVICES	D10 Conveying	D1010 Elevators & Lifts					
		D1020 Escalators & Moving Walks					
		D1090 Other Conveying Systems					
		D1030 Other Conveying Systems					
	D20 Plumbing	D2010 Plumbing Fixtures					
		D2020 Domestic Water Distribution					
		D2030 Sanitary Waste					
		D2040 Rain Water Drainage					
		D2090 Other Plumbing Systems (Labs)					
	D30 HVAC	D3020 Heat Generating Systems					
		D3030 Cooling Generating Systems					
		D3040 Distribution Systems					
		D3050 Terminal & Package Units					
D3060 Controls & Instrumentation							
D3070 Systems Testing & Balancing							
D3090 Other HVAC Systems & Equipment							
D40 Fire Protection	D4010 Sprinklers						
	D4020 Standpipes						
	D4030 Fire Protection Specialties						
	D4090 Other Fire Protection Systems						
D50 Electrical	D5010 Electrical Service & Distribution						
	D5020 Lighting and Branch Wiring						
	D5030 Communications & Security						
	D5090 Other Electrical Systems (Backup Generator)						
	D5040 Other Electrical Systems						
E EQUIPMENT & FURNISHINGS	E10 Equipment	E1010 Commercial Equipment					
	E20 Furnishings	E2010 Fixed Furnishings					
		E2020 Movable Furnishings					
G BUILDING SITEWORK	G20 Site Improvements	G2010 Roadways					
		G2020 Parking Lots					
		G2030 Pedestrian Paving					
		G2040 Site Development					
		G2050 Landscaping					
	G30 Site Mechanical Utilities	G3010 Water Supply					
		G3020 Sanitary Sewer					
		G3030 Storm Sewer					
		G3040 Heating Distribution					
		G3050 Cooling Distribution					
		G3060 Fuel Distribution					
	G40 Site Electrical Utilities	G4010 Electrical Distribution					
		G4020 Site Lighting					
G4030 Site Communications & Security							

*Based on ASTM UNIFORMAT II Classification

2:30 - 2:50	Structural discussion to cover A10, A20, B10, B20, C10 & C20	(Chapman, Jennings, Hicks, McColium, Chester)
2:50 - 3:10	Plumbing to cover D20 & D40	(Darracott, Bridges)
3:10 - 3:30	HVAC to cover D30	(Westbrooks, Thomason, Norton, Savage, Bennett)
3:30 - 3:50	Electrical to cover D50 & G40	(Phule, Goad, White)
3:50 - 4:10	All other Group Elements	(Adams, White, Darracott, Bennett, Reese)
	EITS	
	QUA	

Assessment Form based on UNIFORMAT II

Elemental Classification for Building Specifications, Cost Estimating, and Cost Analysis

Dept. of Commerce

Science Hill Building Subsystem Assessment - Physics

1 (Fail) 2 (Poor) 3 (Avg.) 4 (Good) 5 (New)

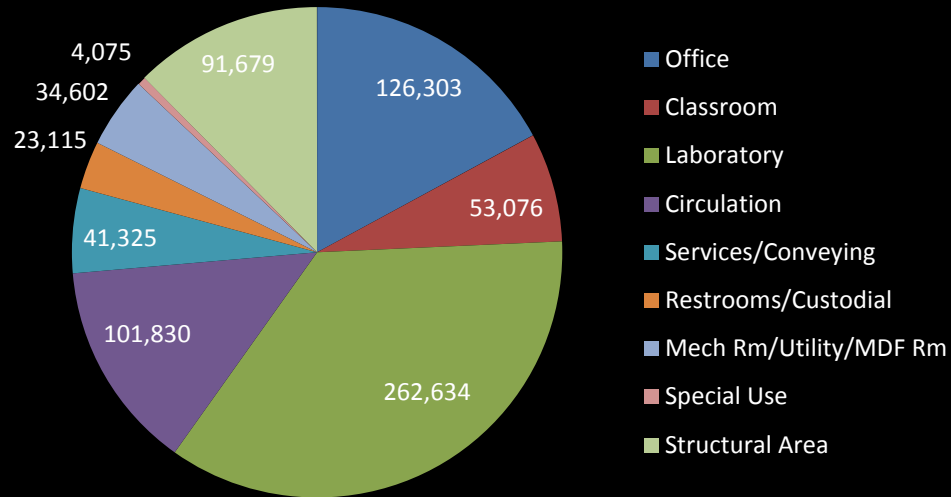
	1 (Fail)	2 (Poor)	3 (Avg.)	4 (Good)	5 (New)
Structure			●		
Interior Finishes			●		
Services/Conveying		●			
Plumbing		●			
HVAC			●		
Electrical		●			
Site Improvements		●			
Precinct Infrastructure		●			
Controls/ Instruments		●			
Fire Protection		●			



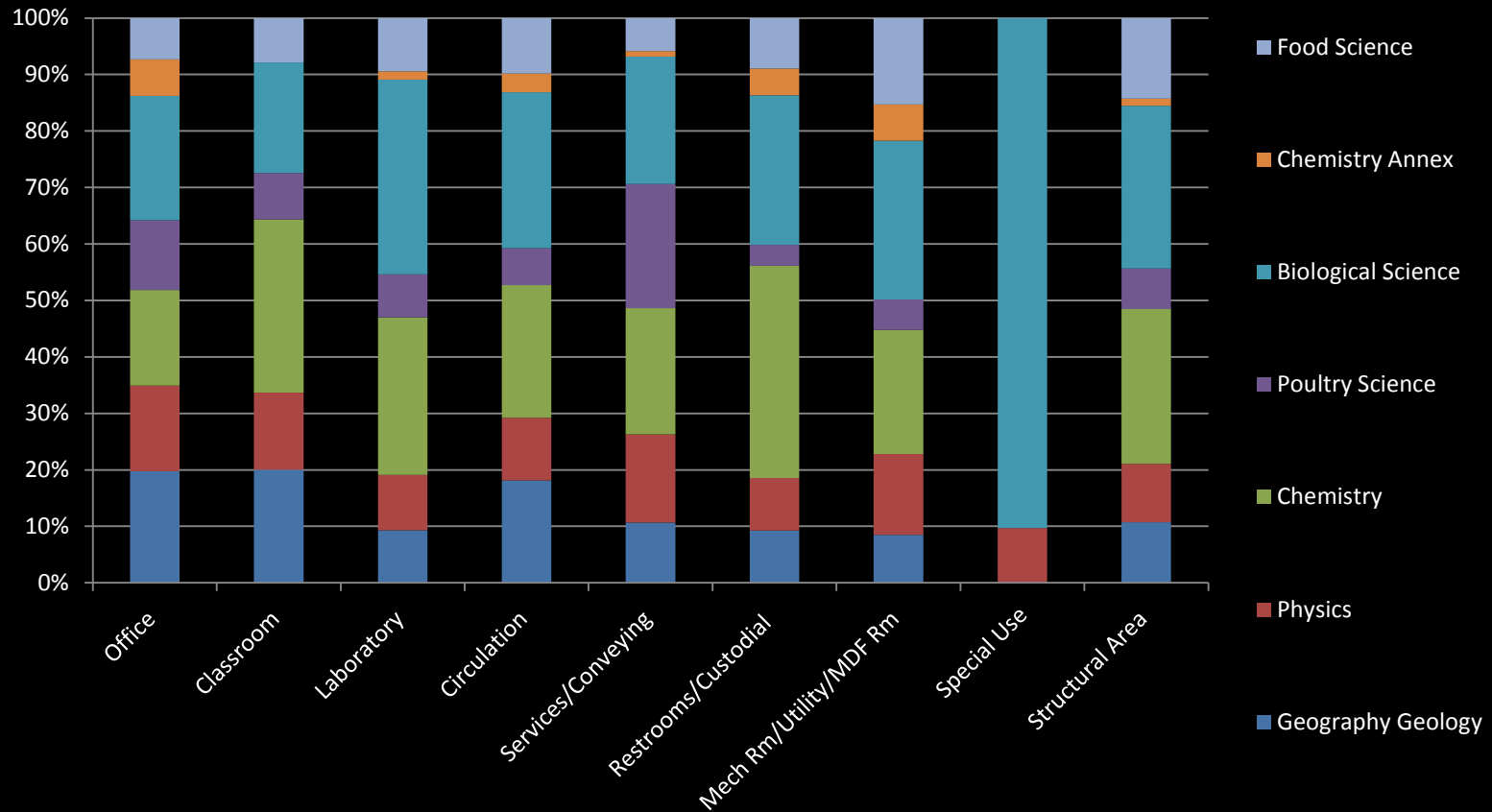
Science Hill Building Subsystem Assessment – Composite Scores



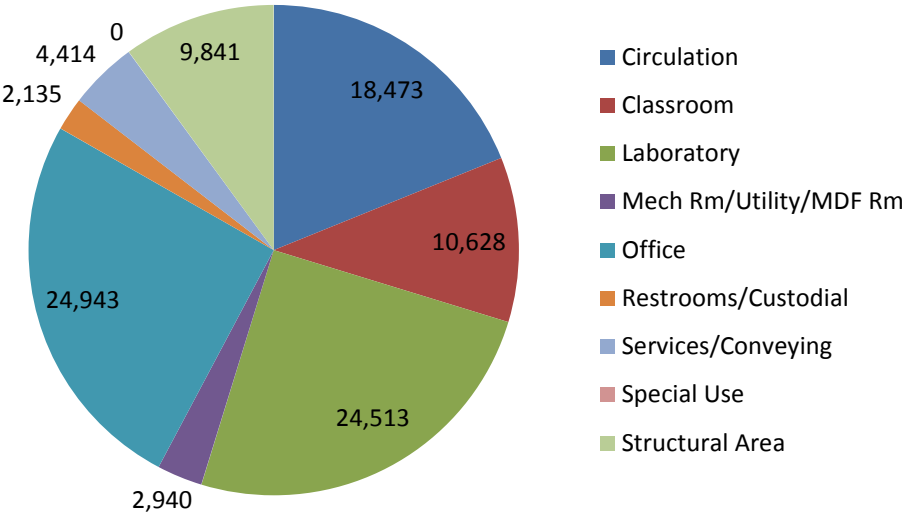
Science Hill Academic Space Type Total Area (Sq. Ft.)



Science Hill Academic Space Types – All Buildings

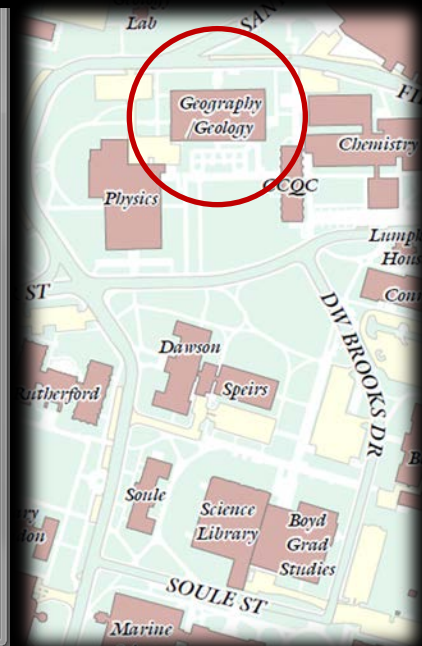


Total Academic Space Type (Sq. Ft.) Geography-Geology (Bldg No. 1002)



Subsystem Renewal and Replacement Costs Geography/Geology Building

Acad Space Type	Office Cost/SF (Low)	Office Cost/SF (High)	Classroom Cost/SF (Low)	Classroom Cost/SF (High)	Laboratory Cost/SF (Low)	Laboratory Cost/SF (High)	Circulation Cost/SF (Low)	Circulation Cost/SF (High)	Services/Conveying Cost/SF (Low)	Services/Conveying Cost/SF (High)	Restroom/Custodial Cost/SF (Low)	Restroom/Custodial Cost/SF (High)	Mechanical/Utility/MDF Rm Cost/SF (Low)	Mechanical/Utility/MDF Rm Cost/SF (High)	Special Use Cost/SF (Low)
Area (SF)	24,943		10,628		24,513		18,473		4,414		2,135		2,940		0
Structure	\$ -	\$ 149,658	\$ -	\$ 63,768	\$ -	\$ 147,078	\$ -	\$ 110,838	\$ -	\$ 26,484	\$ -	\$ 12,810	\$ -	\$ 17,640	\$ -
Skin	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,414	\$ -	\$ -	\$ -	\$ -	\$ -
Services/Conveying	\$ -	\$ 149,658	\$ -	\$ 21,256	\$ -	\$ 49,026	\$ -	\$ 36,946	\$ -	\$ 8,828	\$ -	\$ 4,270	\$ -	\$ 5,880	\$ -
Plumbing	\$ -	\$ 149,658	\$ -	\$ 127,536	\$ -	\$ 294,156	\$ -	\$ 221,676	\$ -	\$ 52,968	\$ -	\$ 25,620	\$ -	\$ 35,280	\$ -
HVAC	\$ -	\$ 723,347	\$ -	\$ 265,700	\$ -	\$ 2,255,196	\$ -	\$ 535,717	\$ -	\$ 128,006	\$ -	\$ 61,915	\$ -	\$ 85,260	\$ -
Controls	\$ -	\$ 124,715	\$ -	\$ 21,256	\$ -	\$ 49,026	\$ -	\$ 36,946	\$ -	\$ 8,828	\$ -	\$ 4,270	\$ -	\$ 5,880	\$ -
Electrical	\$ -	\$ 573,689	\$ -	\$ 244,444	\$ -	\$ 1,127,598	\$ -	\$ 480,298	\$ -	\$ 114,764	\$ -	\$ 55,510	\$ -	\$ 76,440	\$ -
Site improvements	\$ -	\$ 49,886	\$ -	\$ 21,256	\$ -	\$ 49,026	\$ -	\$ 36,946	\$ -	\$ 8,828	\$ -	\$ 4,270	\$ -	\$ 5,880	\$ -
Precinct infrastructure	\$ 49,886	\$ 149,658	\$ 21,256	\$ 127,536	\$ 49,026	\$ 294,156	\$ 36,946	\$ 221,676	\$ 8,828	\$ 52,968	\$ 4,270	\$ 25,620	\$ 5,880	\$ 35,280	\$ -
Interior Finishes/FFE	\$ 873,005	\$ 1,297,036	\$ 371,980	\$ 552,656	\$ 857,955	\$ 3,529,872	\$ 646,555	\$ 960,596	\$ 154,490	\$ 229,528	\$ 111,020	\$ 183,610	\$ 67,620	\$ 152,880	\$ -
Code compliance-Electrical	\$ -	\$ 149,658	\$ -	\$ 63,768	\$ -	\$ 294,156	\$ -	\$ 110,838	\$ -	\$ 26,484	\$ -	\$ 12,810	\$ -	\$ 17,640	\$ -
Code compliance-Mechanical	\$ -	\$ 149,658	\$ -	\$ 63,768	\$ -	\$ 294,156	\$ -	\$ 110,838	\$ -	\$ 26,484	\$ -	\$ 12,810	\$ -	\$ 17,640	\$ -
Code compliance-Fire safety	\$ -	\$ 74,829	\$ -	\$ 31,884	\$ -	\$ 147,078	\$ -	\$ 55,419	\$ -	\$ 13,242	\$ -	\$ 6,405	\$ -	\$ 8,820	\$ -
Code compliance-ADA	\$ -	\$ 74,829	\$ -	\$ 31,884	\$ -	\$ 73,539	\$ -	\$ 55,419	\$ -	\$ 13,242	\$ -	\$ 6,405	\$ -	\$ 8,820	\$ -
Audio Visual Equipment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Abatement	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Demo	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTALS	\$ 922,891	\$ 3,816,279	\$ 393,236	\$ 1,636,712	\$ 906,981	\$ 8,604,063	\$ 683,501	\$ 2,974,153	\$ 163,318	\$ 715,068	\$ 115,290	\$ 416,325	\$ 73,500	\$ 473,340	\$ -
TOTALS (LOW)	\$ 3,258,717														
TOTALS (HIGH)	\$ 18,635,940														





Thank You