Renovate or Replace...

the Process of Long-Range Planning for Mid-Century Buildings

Housing Facilities Conference

THURSDAY, OCTOBER 14, 2010

Session # 905

COLLINS COOPER CARUSI *Architects*

BRAILSFORD & DUNLAVEY

TODAY'S SESSION

- Introductions
- What Makes Mid-Century Halls Such a Unique Challenge
- Planning Process: Bringing Mid-Century Halls into the New Century
- Discussion

WHO'S WHO…

Brad Noyes – Brailsford & Dunlavey

- Vice President…17 years with the firm
- Directs B&D Charlotte Office
- Involved in more than 200 projects, more than 50% in Higher Education

Jeffrey Juliano – Collins Cooper Carusi Architects

- Principal with more than 20 years with firm
- Directs firms University Housing studio
- Involved in the planning and design of more than 2.5 million square feet of campus housing

MID-CENTURY HIGHER EDUCATION: ENROLLMENT & FACILITIES SOAR

- Social change & enrollment growth began in the late 1940's and lasted through the mid-1960's
- Passage of the G.I. Bill (1944) & Title IV of Housing Act (1950) increased student populations across the country with larger numbers of "typical" students, as well as more women, persons of color & older students
- Higher Ed. Facilities Act of 1963 extended government support for developing housing facilities just as the enrollment of women began to grow…resulting in the "twin towers" phenomenon

CHARACTERISTICS OF MID-CENTURY RESIDENCE HALLS

- **Planned & Built Quickly**
  Accommodating rapidly-growing student enrollment meant high density was the name of the game…didn't address the social or academic experience
- **Minimal Amenities**
  Small rooms, community baths, limited privacy, 1-2 laundry rooms/ kitchens per building
- **Limited Common Space**
  Usually single large gathering lobbies/lounges, but not very warm & not nearly enough small study space
- **Systems**
  Single point of control, no individual control with unit
- **Structures**
  Often poured-in-place concrete with masonry infill & "common walls.
- **Envelope**
  Single-pane glazing systems, limited insulation, weak storm water management control.

HIGHER EDUCATION IN A NEW CENTURY

Universities now face a range of issues with these facilities:

- Debt is often retired, so building revenues are supporting debt service, maintenance/improvements—maybe even operations—for other housing buildings
- M/E/P systems are inefficient, often hard to service & thermal comfort difficult to manage
- Facilities do not support today's technological requirements
- Condition & design are not consistent with expectations of incoming students & their parents, nor with institutional leaders/Board for supporting recruitment & learning
- Emerging price sensitivity due to overall cost of education coupled with perceived lack of value from Mid-Century facilities

PLANNING PROCESS: QUESTIONS FOR PROJECT INITIATION

- **Facilities Assessment**
  - What are the conditions of existing systems: code, life safety, envelope, utilities?
  - How do the buildings & their sites reconcile with future campus plans?
- **Departmental Mission & Goals**
  - How does the current design support or hinder the educational goals?
  - Do the buildings support: community building, aesthetic / quality of space, flexibility, technology?
- **Community Impressions**
  - What impressions are created for students and parents?
  - What is the administration's impression?
- **Financial Implications**
  - Operating costs, Debt service, 1st Cost vs. Life Cycle Costs
- **Sustainability**
  - What strategies are realistic for us to consider?
  - What are the University standards: LEED vs. Sustainable?
- **Implementation**
  - Can a percentage of rooms—or even an entire building—go off-line?
  - Can swing space be created elsewhere?
  - How can the work be phased?

PLANNING PROCESS: WHERE TO BEGIN?

Approach

Phase I - Understanding
Understanding the Working Conditions

Phase II - Analysis | Strategy
Developing the “Big-Ideas”

Phase III - Concept Development
Defining the Preferred Concept

PLANNING PROCESS:PHASE I

Understanding

- Formulate & Document Project Goals & Objectives
  - Strategic Asset Valuation (SAV) Process
- Evaluation of Existing Conditions
  - Tours & Inspections of High-Rise Halls
  - M/E/P & Structural Review (including previous reports / data) & owner operational issues
  - Site Analysis Focusing on Opportunities & Constraints for Improvements
- Research Key Student Housing Market Factors
  - Focus Groups & Interviews
  - Benchmarking with Cross-applicant & Peer Institutions
  - Survey Student Community for Cost & Amenity Sensitivities
  - Create Demand Model (Unit-type Demand & Occupancy Projections per year per unit type)
- Develop Financial Model (Variables: Unit Configuration, Revenue Potential, Construction Cost Projections, Phasing & Financing)

EXISTING CONDITIONS FINDINGS

Hall #1

Built: 1966

General Information:

- Total Gross Square Feet: 210,484
- Square feet per Bed: 225
- 935 Beds: 1st-Year Women student-focused
- Nine floors: 1 - Student Services offices & 2-8 - residents
- Double-occupancy rooms with community bath per wing
- Structure: Concrete frame with brick veneer exterior & non-thermally broken windows

Findings:

- Well Maintained: No major Renovations/Upgrades, so starting to show typical signs of age
- Exterior Envelope & Roof: Water Infiltration issues
- Life Safety, ADA & Code issues: Upgrading required
- Structural Systems: No reported problems
- HVAC: Galvanized, 2-pipe system has corrosion issues
- Plumbing, Electrical & Fire Protection: Building systems require upgrading

EXISTING CONDITIONS FINDINGS

Hall #2

Built: 1963

General Information:

- Total Gross Square Feet: 188,149
- Square feet per Bed: 195
- 965 Beds: 1st-Year Women & Men
- Nine floors: 1 - Student Services offices & 2-8 - residents
- Double-occupancy rooms with community bath per wing
- Structure: Concrete frame with exterior non-thermally broken porcelain enamel panel glazed curtain wall system

Findings:

- Well Maintained: No major Renovations/Upgrades, so starting to show typical signs of age
- Curtain Wall & Roof: Water Infiltration issues
- Life Safety, ADA & Code issues: Upgrading required
- Structural Systems: No reported problems
- HVAC: Heat/Cool are separate systems & require replacing
- Plumbing, Electrical & Fire Protection: Building systems require upgrading

EXISTING CONDITIONS FINDINGS

Hall #3

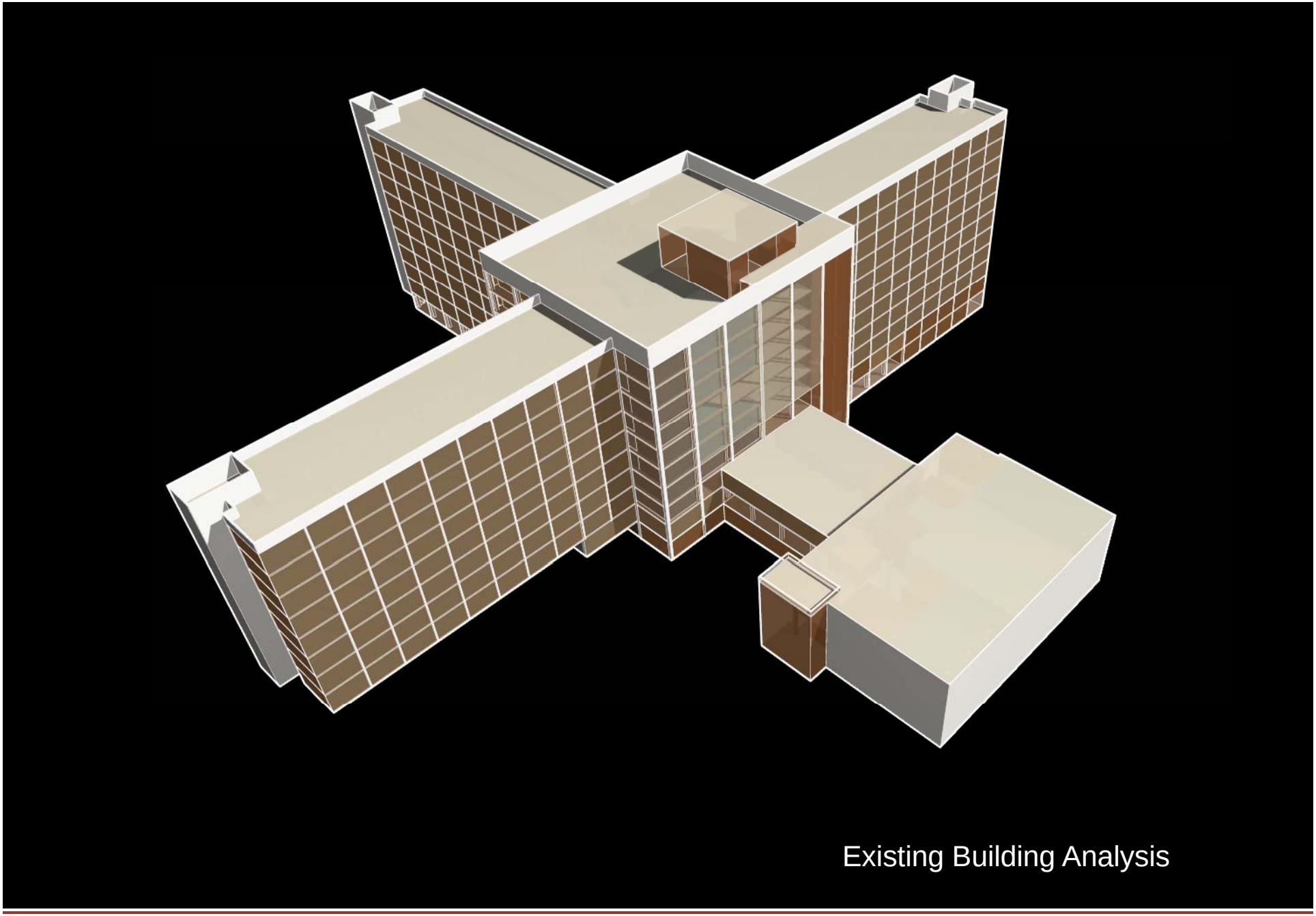
Built: 1965

General Information:

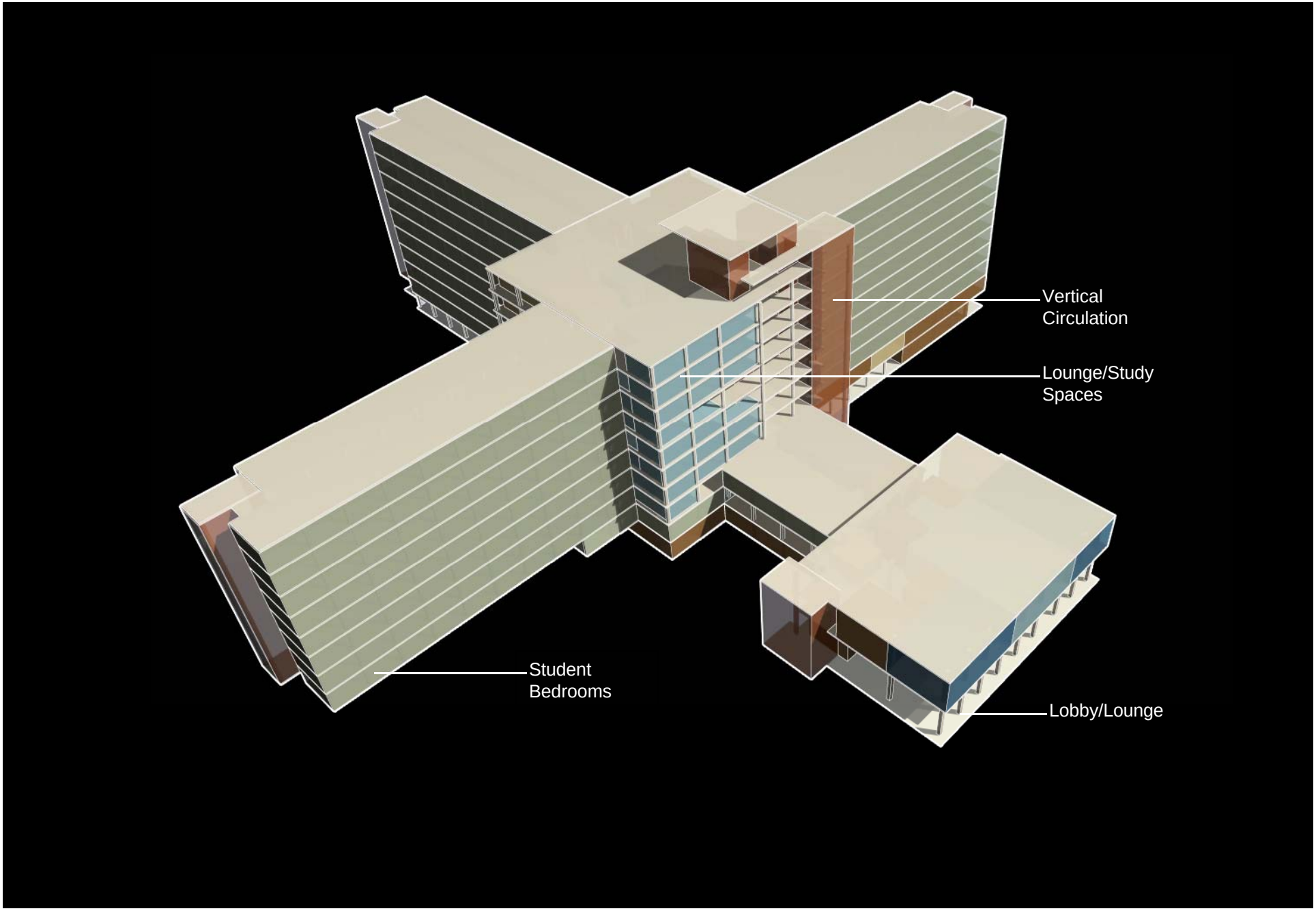
- Total Gross Square Feet: 230,312
- Square feet per Bed: 236
- 975 Beds: 1st-Year Women & Men
- Ten floors: 1 - Student Services offices & 2-9 - residents
- Double-occupancy rooms with community bath per wing
- Structure: Concrete frame with brick veneer exterior & non-thermally broken windows

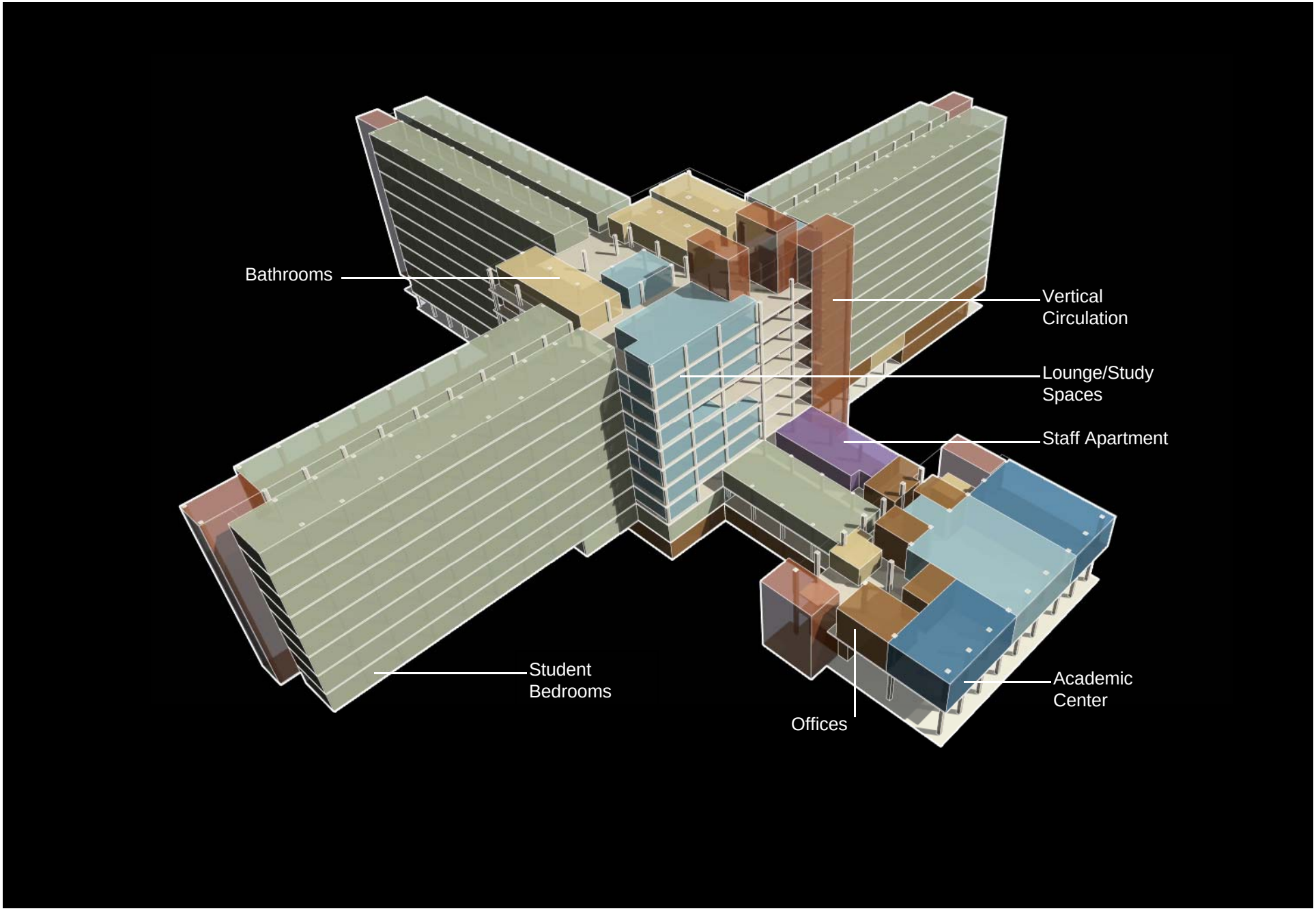
Findings:

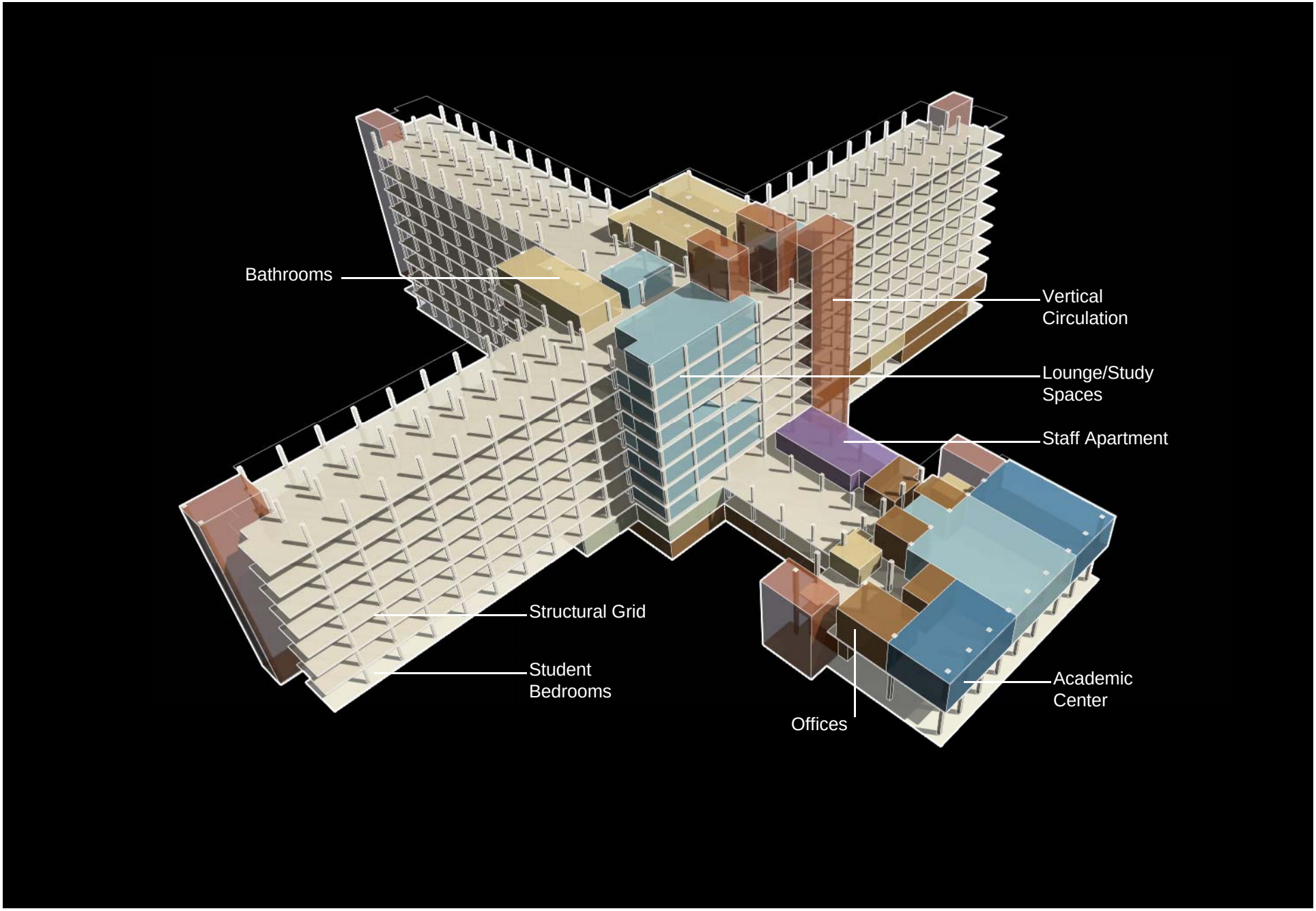
- Well Maintained: No major Renovations/Upgrades, so starting to show typical signs of age
- Exterior Envelope & Roof: Water Infiltration issues
- Life Safety, ADA & Code issues: Upgrading required
- Structural Systems: No reported problems
- HVAC: Galvanized, 2-pipe system has corrosion issues
- Plumbing, Electrical & Fire Protection: Building systems require upgrading

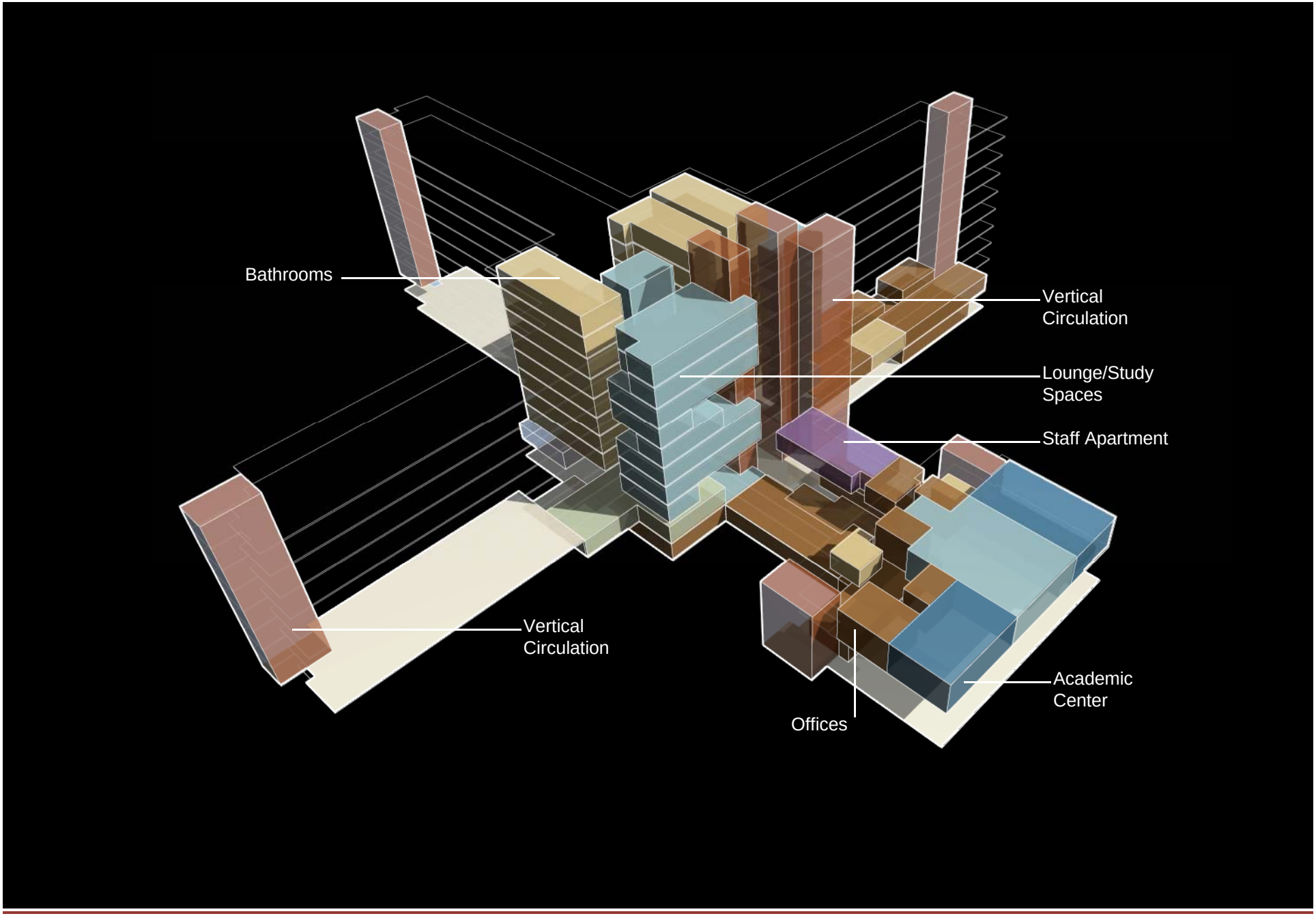


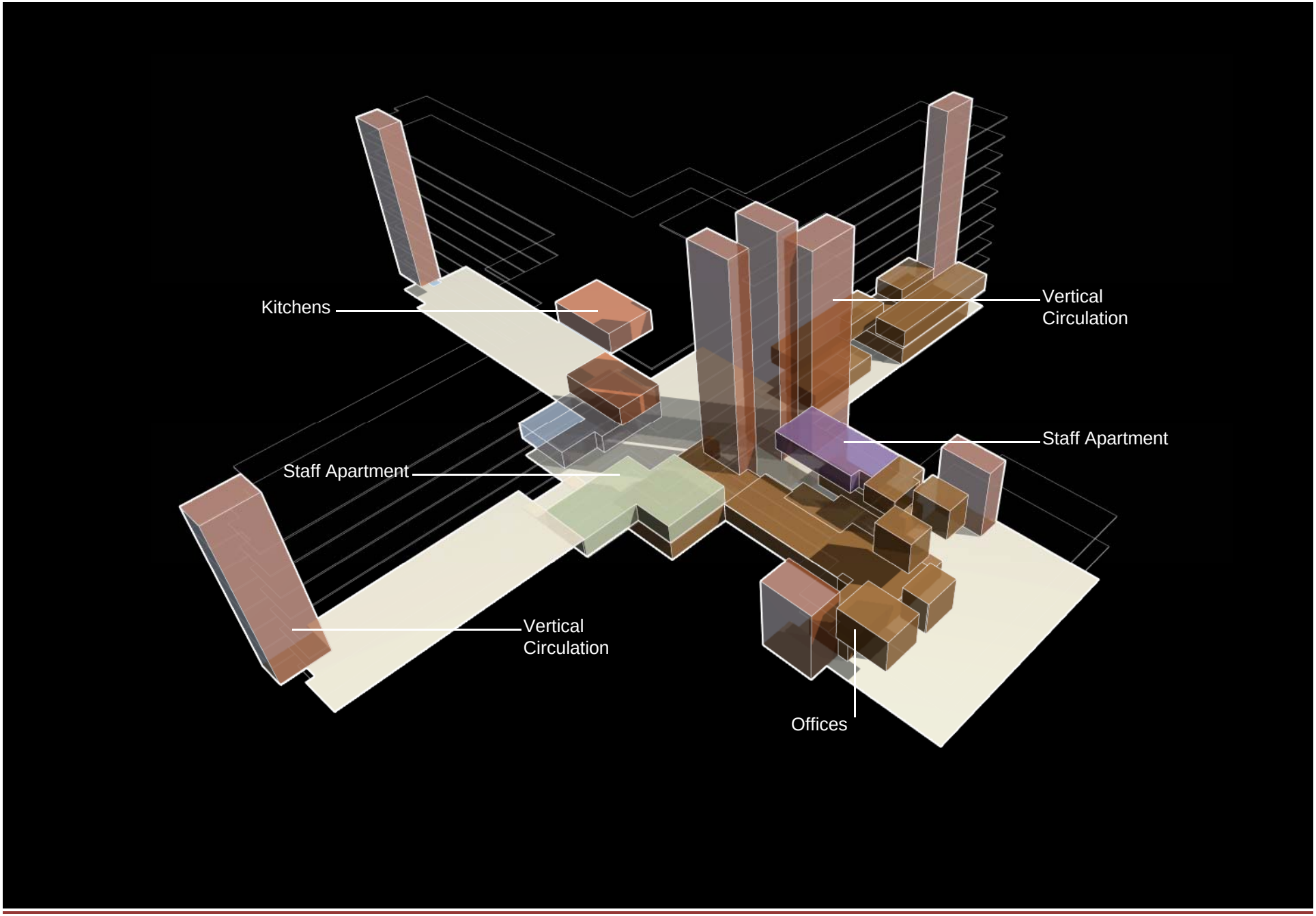
Existing Building Analysis

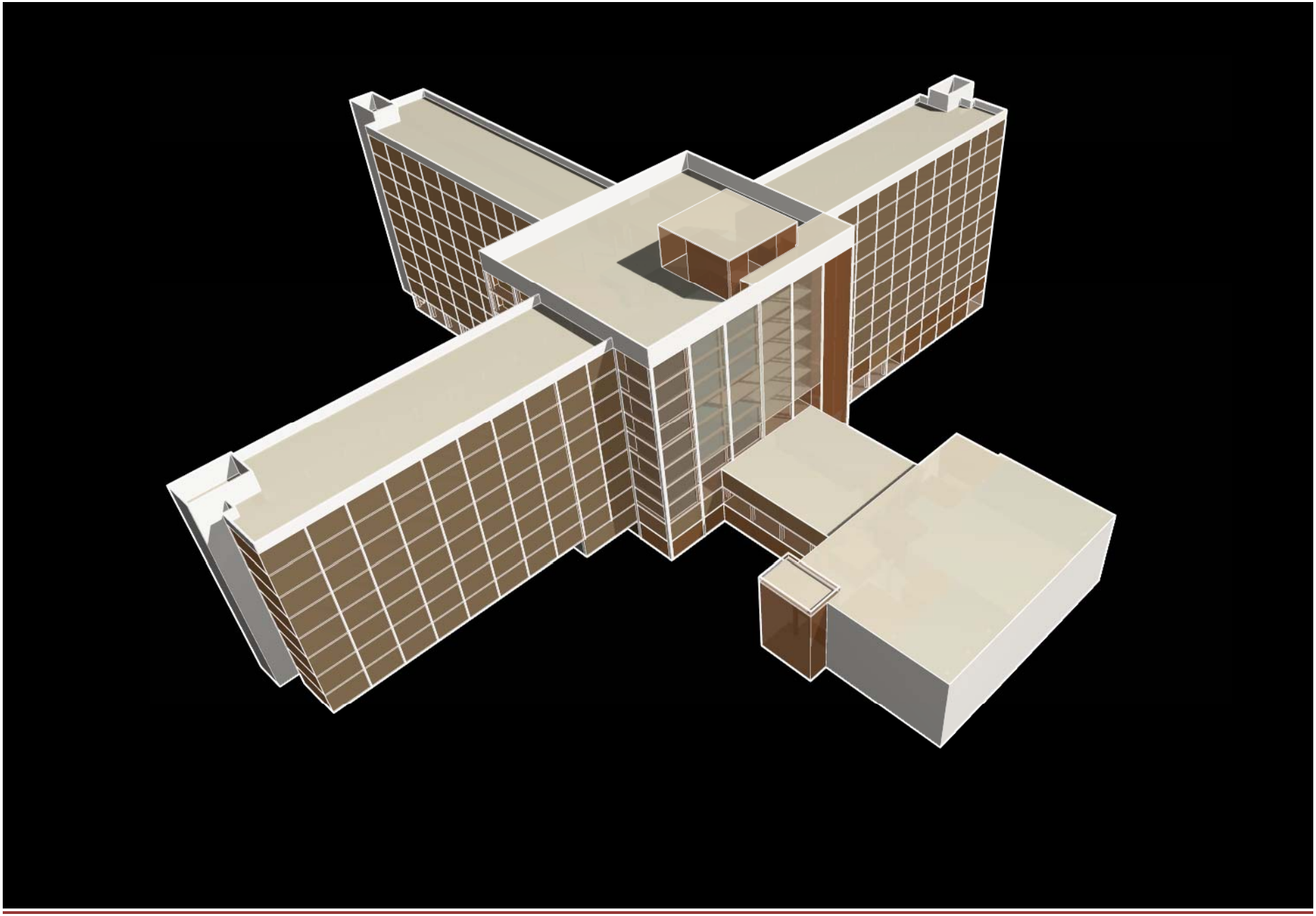

Vertical
Circulation
Lounge/Study
Spaces
Student
Bedrooms
Lobby/Lounge


Bathrooms
Vertical Circulation
Lounge/Study Spaces
Staff Apartment
Student Bedrooms
Offices
Academic Center


Bathrooms
Vertical Circulation
Lounge/Study Spaces
Staff Apartment
Structural Grid
Student Bedrooms
Offices
Academic Center


Bathrooms
Vertical Circulation
Lounge/Study Spaces
Staff Apartment
Vertical Circulation
Academic Center
Offices


Kitchens
Vertical Circulation
Staff Apartment
Staff Apartment
Vertical Circulation
Offices



DEMAND ANALYSIS

Undergraduate Demand Assumptions

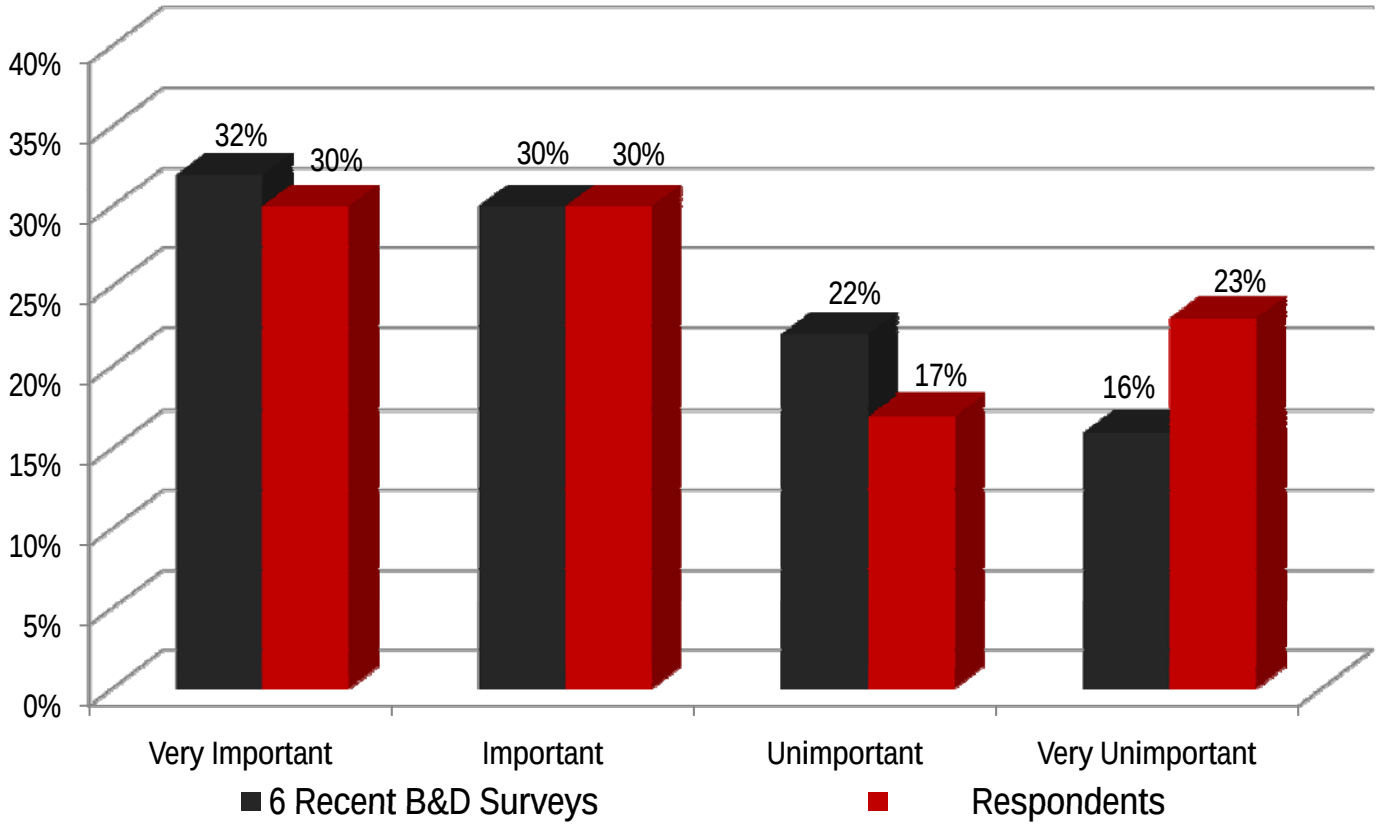
- No Enrollment Growth: ~ 26,000 Undergraduate Students
- Increased Freshman Capture: 96% to 99%
- OCR: Traditional – 1.2; Semi-Suite – 1.3; Super Suite – 1.4; Apt – 1.5
- Filtered: < 25 years; Paying > $400; Trad. Living Arrangement

Undergraduate Demand Overview

Class	Current Demand	Current Capture Rate	Potential Demand	Potential Capture Rate
Freshman Year	4,752	96%	4,935	99%
Sophomore Year	1,005	17%	2,168	37%
Junior Year	594	9%	1,890	28%
Senior Year	417	5%	1,316	16%
Total	6,768	26%	10,308	40%

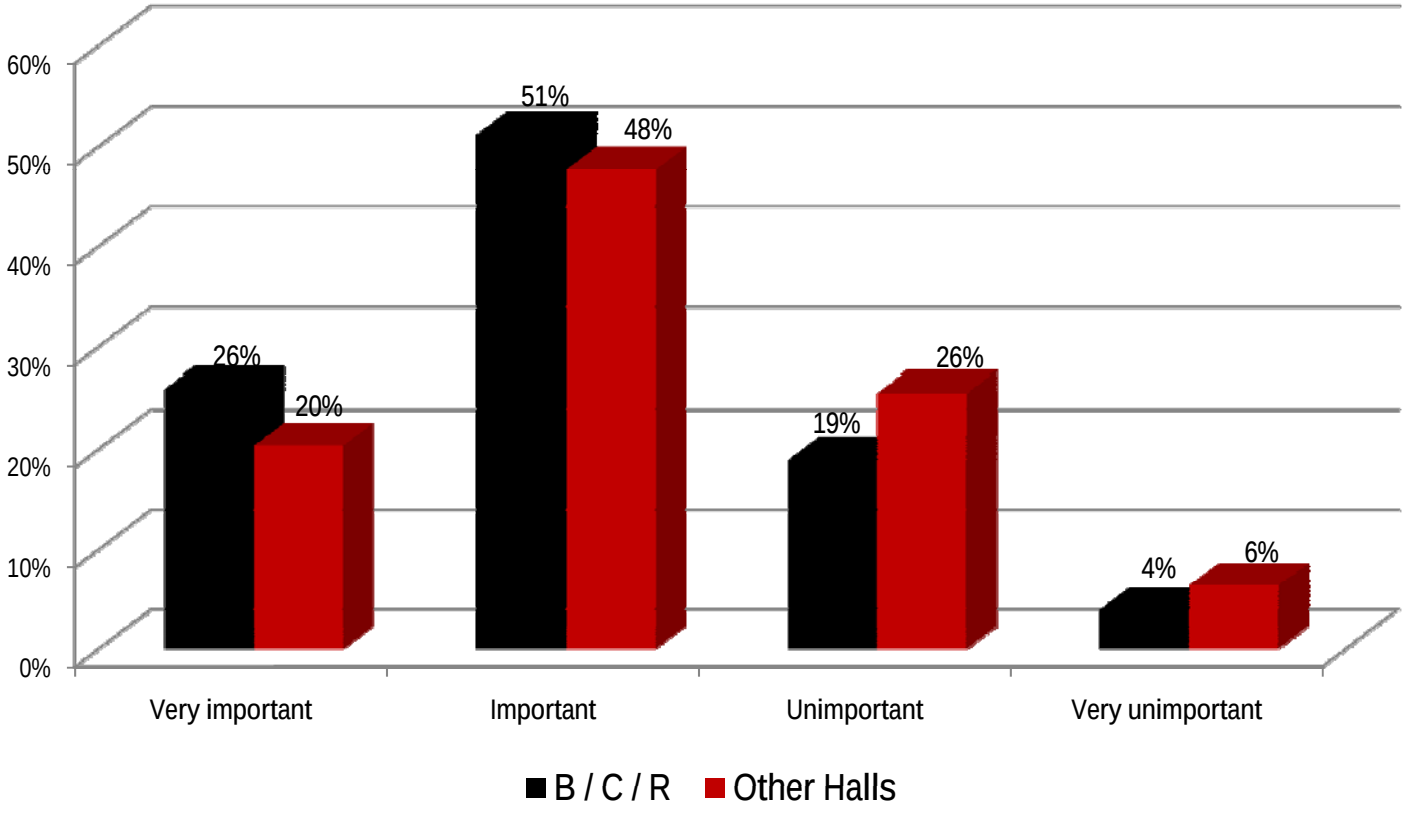
DEMAND ANALYSIS

Q2. How important was the availability of on-campus housing in your decision to attend the University?



DEMAND ANALYSIS

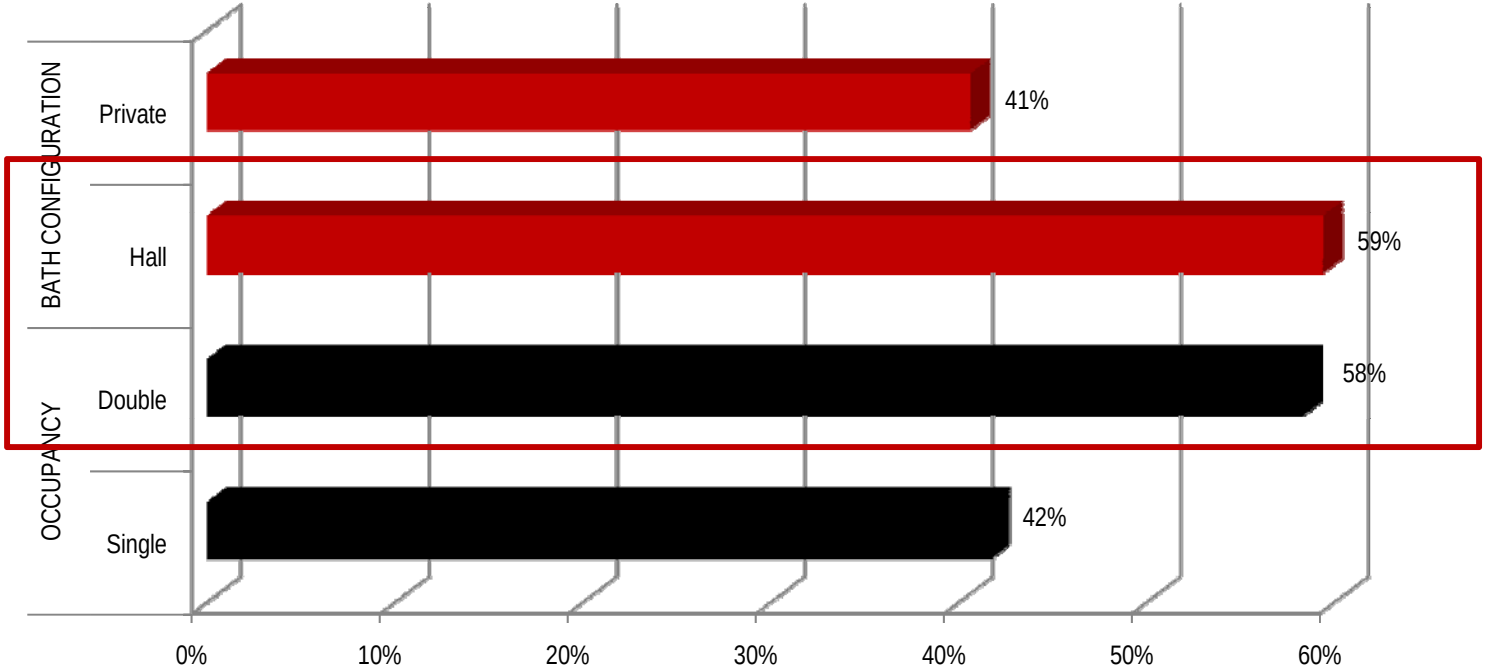
Q21. How important are these halls to campus culture & traditions?



DEMAND ANALYSIS

Freshmen Demand for Traditional Units

	Hall Bath (D)	Hall Bath (S)	Private Bath (D)	Private Bath (S)
Units Demanded by Freshmen	584	725	701	195
% of Total Traditional Demand	26%	33%	32%	9%



DEMAND ANALYSIS

Rankings Potential Improvements

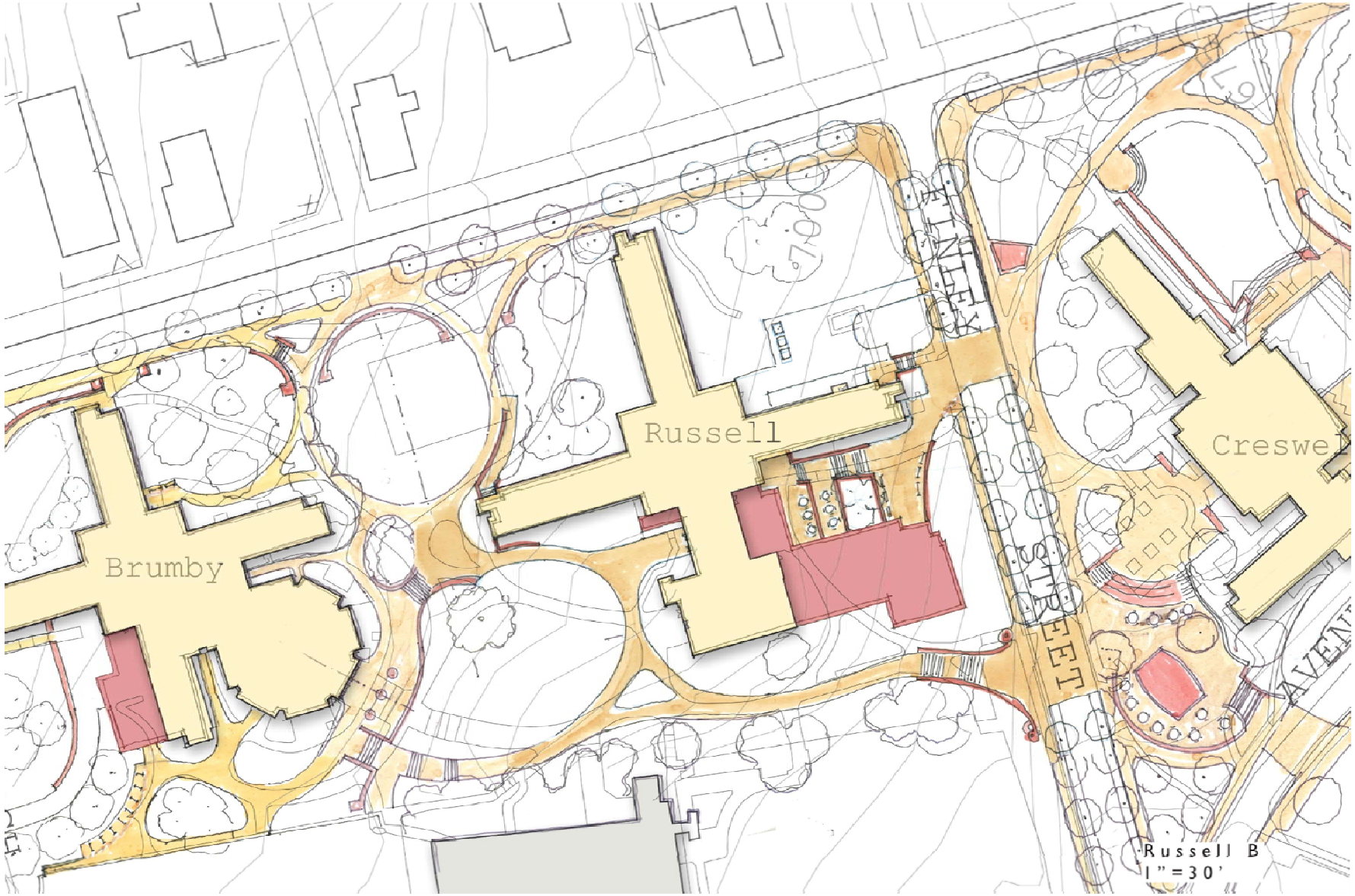
	Resident Room Improvements	Floor/Common Area Improvements	Building Amenity/ Interior Condition Improvements	Exterior Condition Improvements	
All Respondents	57.78%	28.50%	8.89%	4.84%	1st
	23.01%	45.88%	20.13%	10.98%	2nd
	15.03%	19.48%	49.41%	16.08%	3rd
	4.18%	6.14%	21.57%	68.10%	4th
#1, #2, #3 Respondents	56.34%	29.58%	8.45%	5.63%	1st
	22.07%	45.54%	20.89%	11.50%	2nd
	16.20%	17.84%	49.77%	16.20%	3rd
	5.40%	7.04%	20.89%	66.67%	4th
	Improve amenities for resident rooms including updated furniture/finishes and new lighting.	Improve amenities for each building's floors and wings including new lighting, more social lounges and quiet study spaces, as well as features such as kitchens and laundry rooms.	Improve amenities for each building's community areas including TV/social spaces, recreation areas, study areas and program/activity spaces - plus new lighting, painting, etc.	Improve the overall exterior conditions/architectural character of each building by adding new entryways, updated wall treatments, outdoor social/recreation features, landscaping, etc.	

1st 2nd 3rd 4th

PLANNING PROCESS:PHASE II

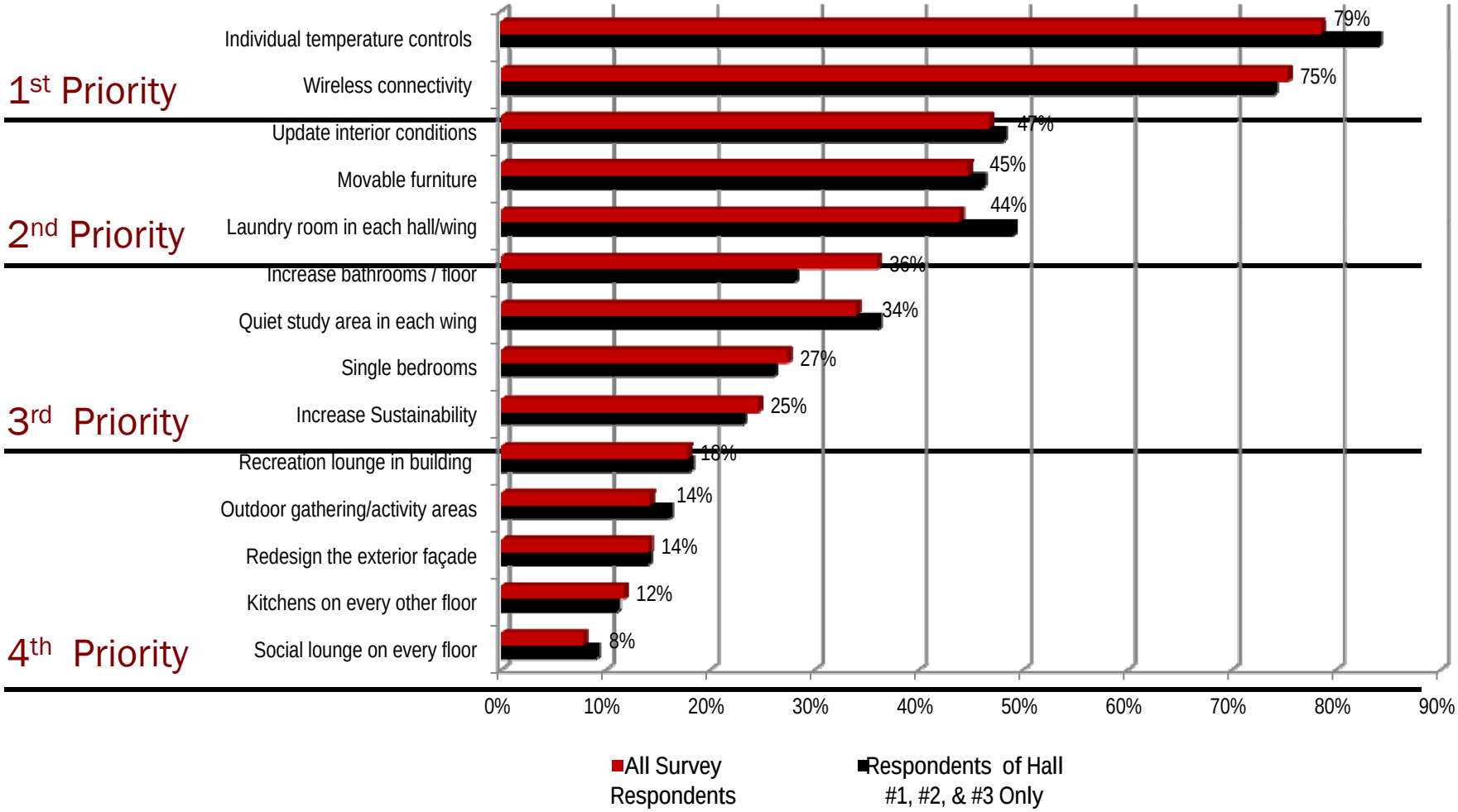
Analysis/Strategy

- Facilitate Design Charrette(s) with Stakeholders & Project Team
- Create & Evaluate a Range of Potential Design Solutions
- Generate Iterative Financial Scenarios for Conceptual Design Schemes
- Develop Sustainable Standards & Strategies
- Devise Phasing & Implementation Strategies
- Generate Budget Cost Estimate Based on Gross Square Footage


Brumby
Russell
Creswe
Russell B
1" = 30'

DEMAND ANALYSIS

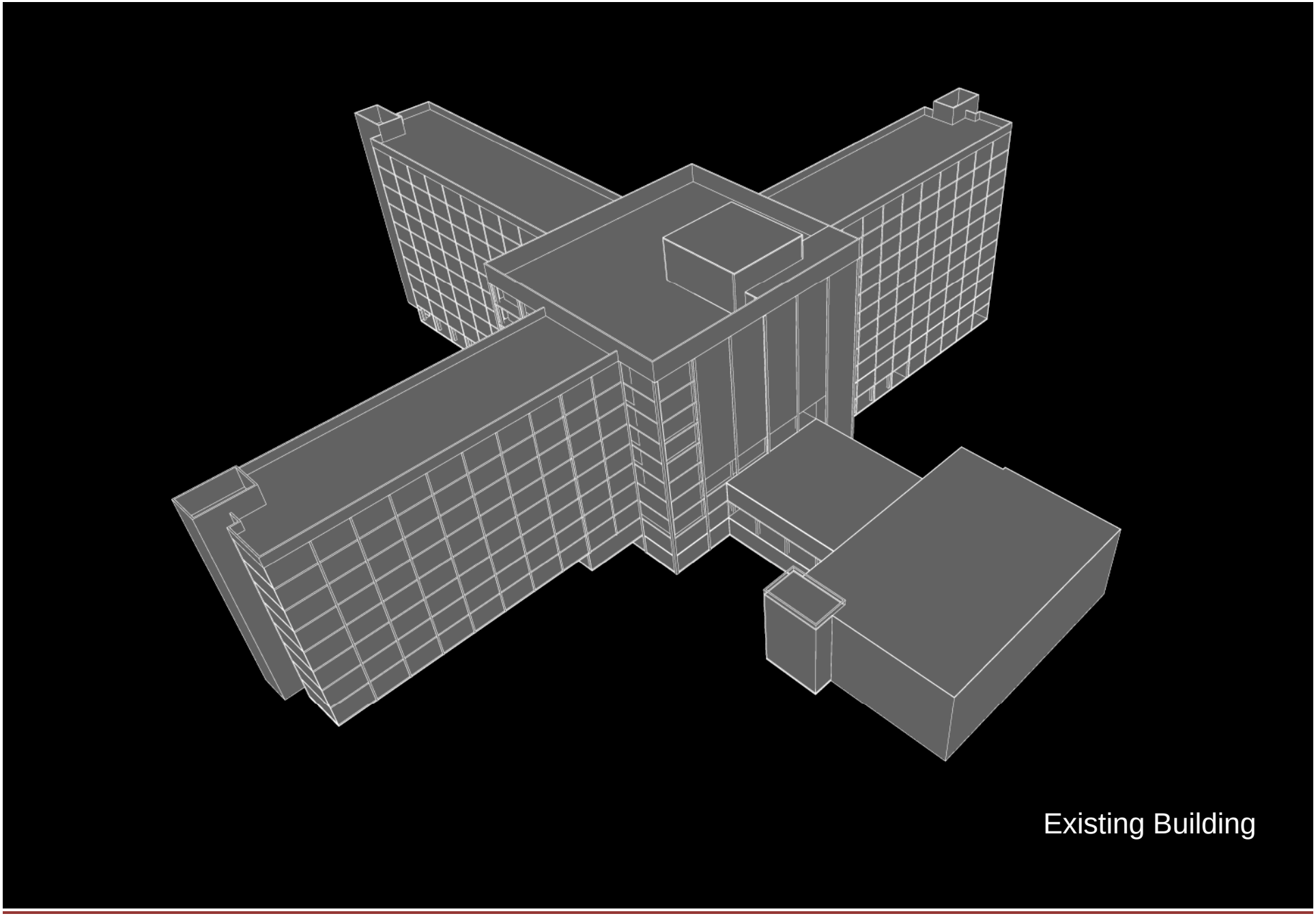
Renovation Preferences



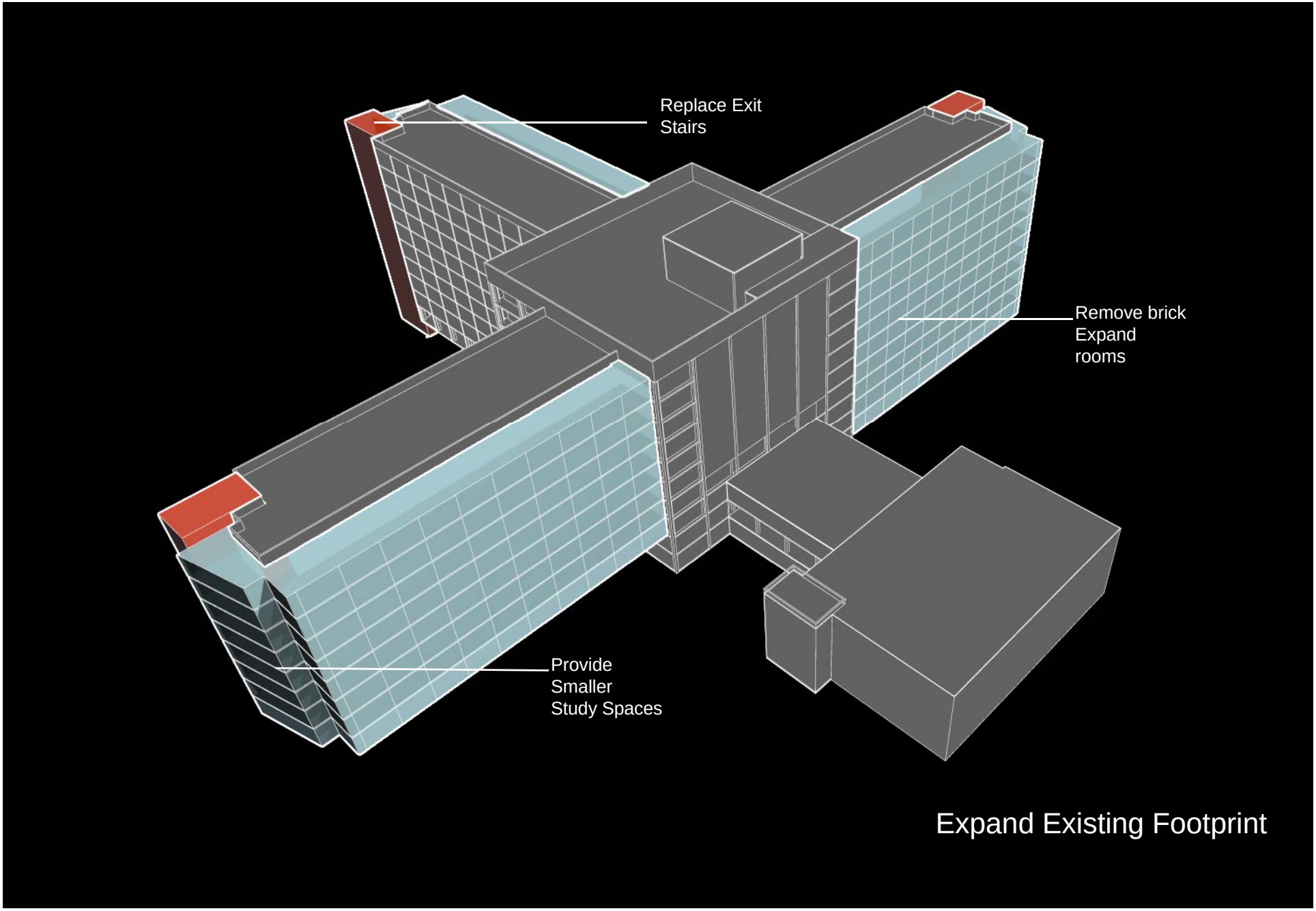
FINANCIAL MODEL

Development Cost Projections

PROJECT TYPE:	Light Renovation		Medium Renovation		Heavy Renovation		New Construction	
	Cost per SF	*% of Total Costs*	*Cost per SF*	*% of Total Costs*	*Cost per SF*	*% of Total Costs*	*Cost per SF*	*% of Total Costs*
Hard Cost per SF (includes enclosed building, demolition, excavation & site preparation, site utilities & infrastructure, landscaping)	$30	67%	$105	80%	$135	80%	$175	80%
Soft Cost per SF (includes A/E fees, testing/survey fees, project contingencies, project management fees, and FF&E)	$15	33%	$26	20%	$35	20%	$50	20%
Total Project Cost per SF	$45		$131		$170		$225	
Average SF per Bed (B/C/R Only)	219 SF		219 SF		219 SF		219 SF	
Cost per Bed to Renovate	$9,855		$28,744		$37,230		$49,275	



Existing Building



Expand Existing Footprint

FINANCIAL MODEL

Single-Variable Sensitivity Analysis:
Post-Renovation Debt Capacity Analysis

- A 1% increase in Rental Rate in 2021-2022
  - $199,250 in additional cash flow
  - $2.75 Million in additional debt capacity
  - $4.34 per SF in additional capital expenditures

OR

  - $968 per bed in additional capital expenditures

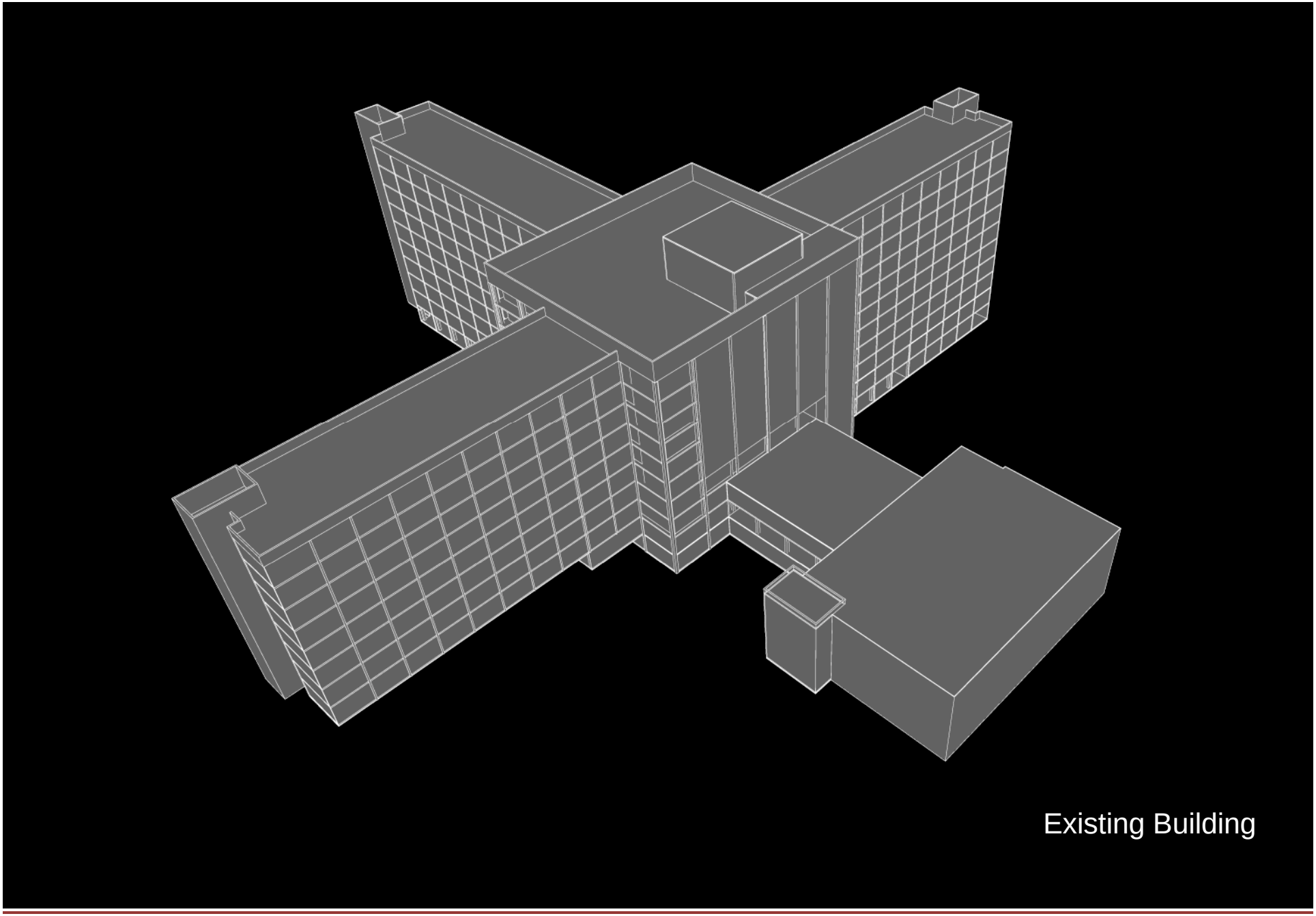
FINANCIAL MODEL

Multi-Variable Sensitivity Analysis:
Impact of Construction Cost & Rental Revenue on 2021 DCR

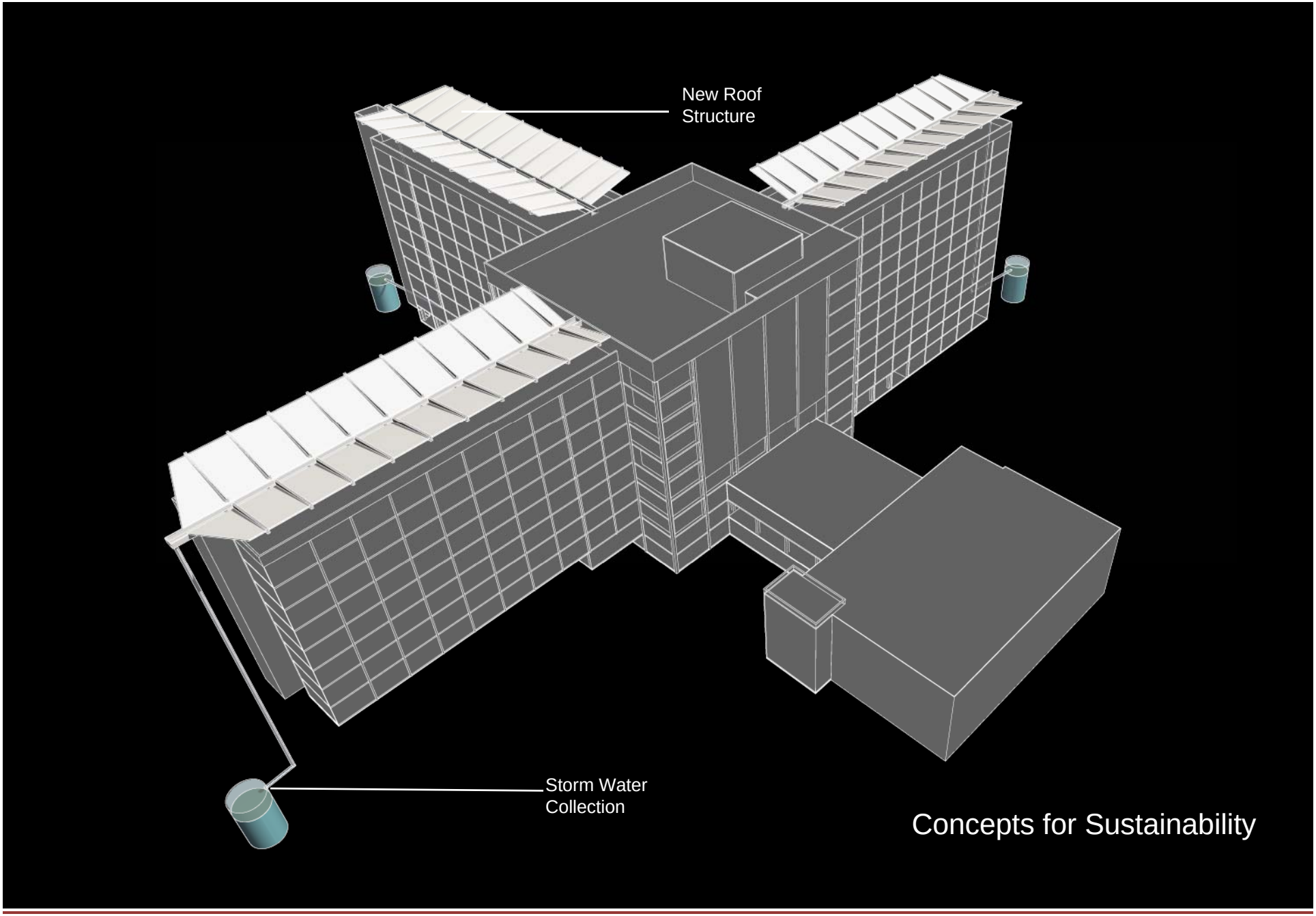
Hard Costs per Square Foot for Renovation

Rental Rate Percentage Increase for Renovated Beds	$100	$105	$110	$115	$120	$125	$130	$135	$140
0%	1.01	0.99	0.97	0.96	0.94	0.92	0.90	0.89	0.87
2.5%	1.04	1.02	1.00	0.98	0.96	0.94	0.92	0.91	0.89
5.0%	1.06	1.04	1.02	1.00	0.98	0.96	0.95	0.93	0.91
7.5%	1.08	1.06	1.04	1.02	1.00	0.99	0.97	0.95	0.93
10.0%	1.11	1.09	1.07	1.05	1.03	1.01	0.99	0.97	0.96
12.5%	1.13	1.11	1.09	1.07	1.05	1.03	1.01	0.99	0.98
15.0%	1.16	1.13	1.11	1.09	1.07	1.05	1.03	1.02	1.00
17.5%	1.18	1.16	1.14	1.11	1.09	1.07	1.06	1.04	1.02
20.0%	1.20	1.18	1.16	1.14	1.12	1.10	1.08	1.06	1.04
22.5%	1.23	1.20	1.18	1.16	1.14	1.12	1.10	1.08	1.06
	$125	$131	$138	$144	$150	$156	$163	$169	$175

Total Project Costs per Square Foot for Renovation



Existing Building



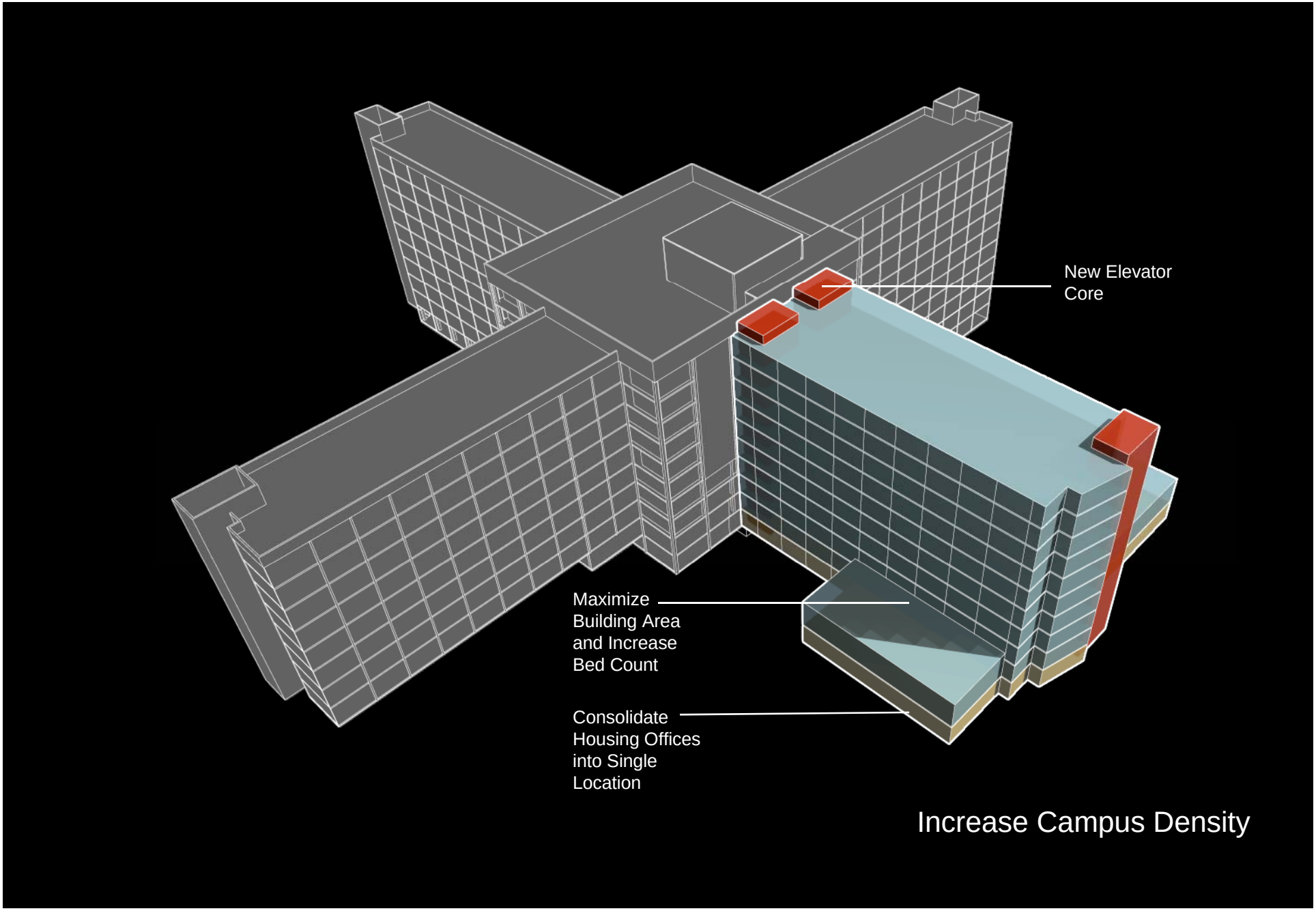
Concepts for Sustainability

FINANCIAL MODEL

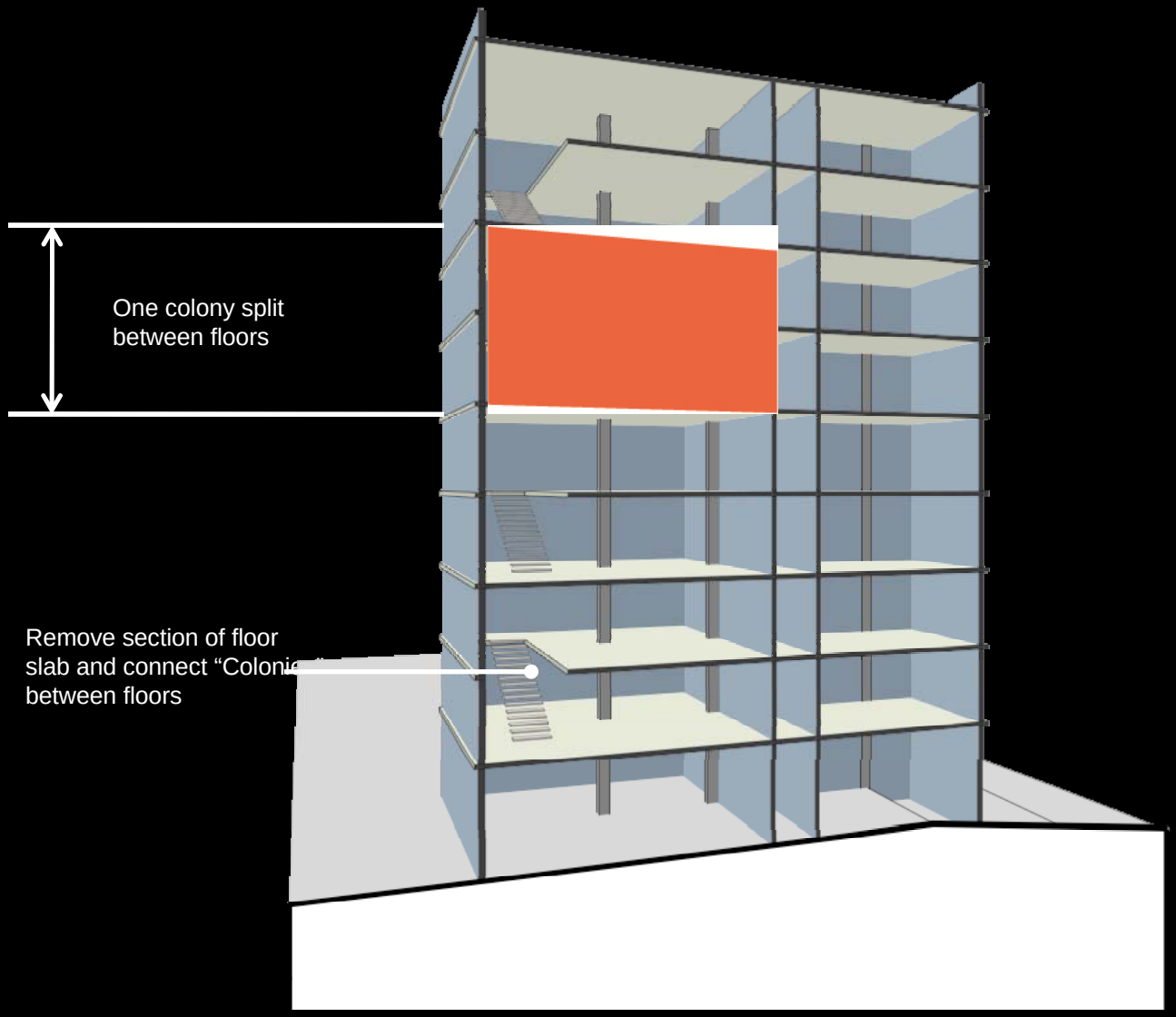
Multi-Variable Sensitivity Analysis:
Impact of Swing Space on Renovation Debt Capacity (2021)

Rental Rate Percentage Increase for New Beds	Total Number of New Construction Beds Added as Swingspace								
	0	25	50	75	100	125	150	175	200
0%	$0.00	$0.14	$0.38	$0.53	$0.76	$0.90	$1.13	$1.28	$1.52
2.5%	$0.00	$0.20	$0.49	$0.69	$0.98	$1.16	$1.46	$1.65	$1.95
5.0%	$0.00	$0.25	$0.60	$0.85	$1.19	$1.43	$1.78	$2.03	$2.38
7.5%	$0.00	$0.30	$0.70	$1.01	$1.41	$1.70	$2.10	$2.40	$2.80
10.0%	$0.00	$0.36	$0.81	$1.17	$1.62	$1.97	$2.42	$2.78	$3.23
12.5%	$0.00	$0.41	$0.92	$1.33	$1.84	$2.24	$2.74	$3.16	$3.66
15.0%	$0.00	$0.47	$1.03	$1.49	$2.05	$2.51	$3.07	$3.53	$4.09
17.5%	$0.00	$0.52	$1.13	$1.65	$2.27	$2.77	$3.39	$3.91	$4.52
20.0%	$0.00	$0.57	$1.24	$1.81	$2.48	$3.04	$3.71	$4.28	$4.95

**Debt capacity totals represent millions of dollars*



Increase Campus Density



Colony Connectivity

PLANNING PROCESS: PHASE III

Concept Development

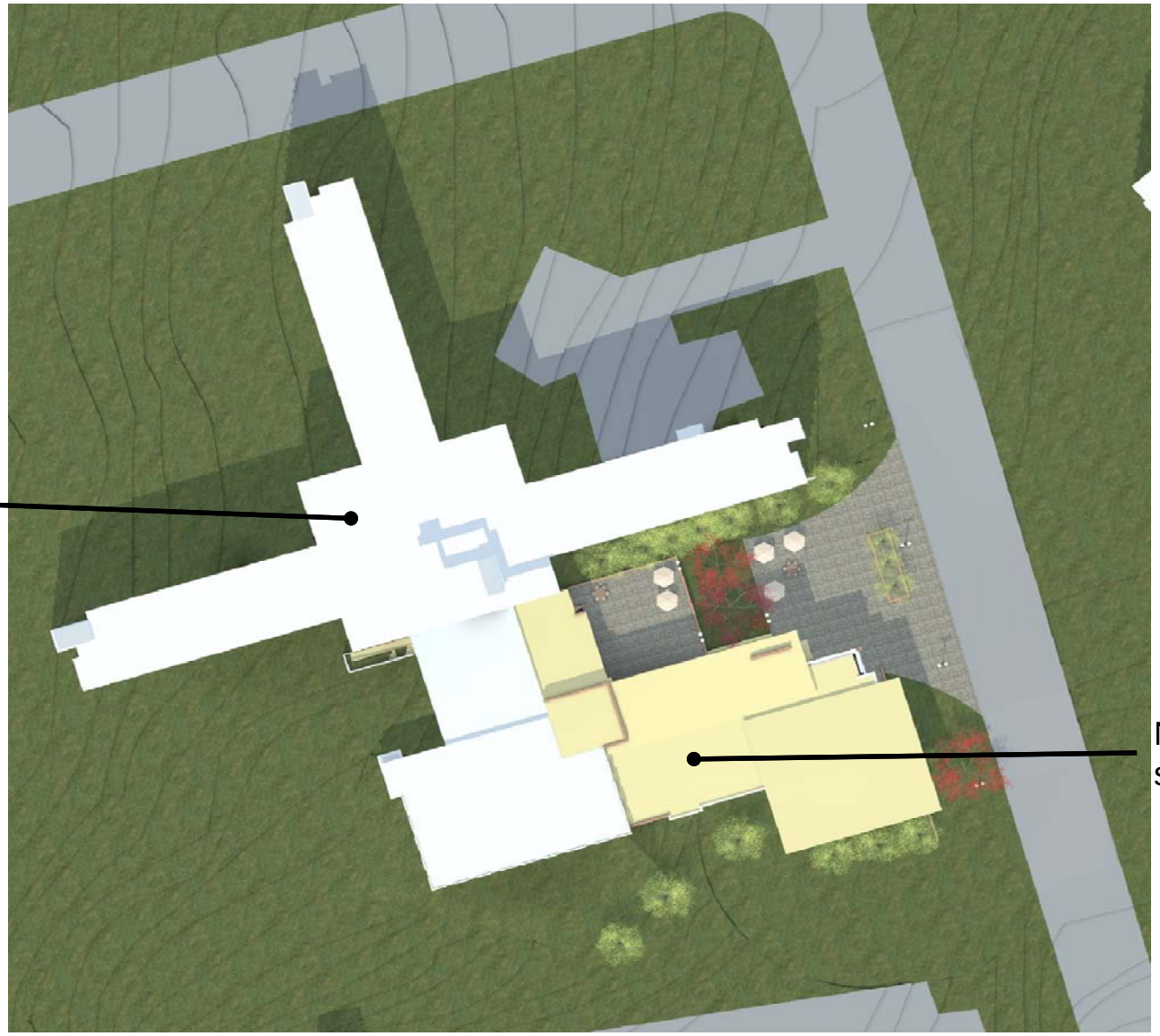
- Develop Program of Requirements for the Preferred Solution
- Reconcile Phasing Plan to Financial Model for Preferred Solution
- Develop a 30-Year Operating Model for the Renovated High-Rise Halls in context of the Housing System Financial Requirements
- Develop Life Cycle Energy Analysis Compare Various M/E/P System Options
- Generate Capital Cost Development Budget, inc. Expenditures by Phase and FF&E Estimates
- Create Architectural Concept Plans with Unit Types, Bed Counts, Building Massing/Elevations, Concept Site Plan & Floor Plans
- Develop Draft Narratives for Architectural, Civil, Structural, and M/E/P/FP as well as Construction Schedule & Phasing Approach

FINANCIAL MODEL

Project Phasing Matrix

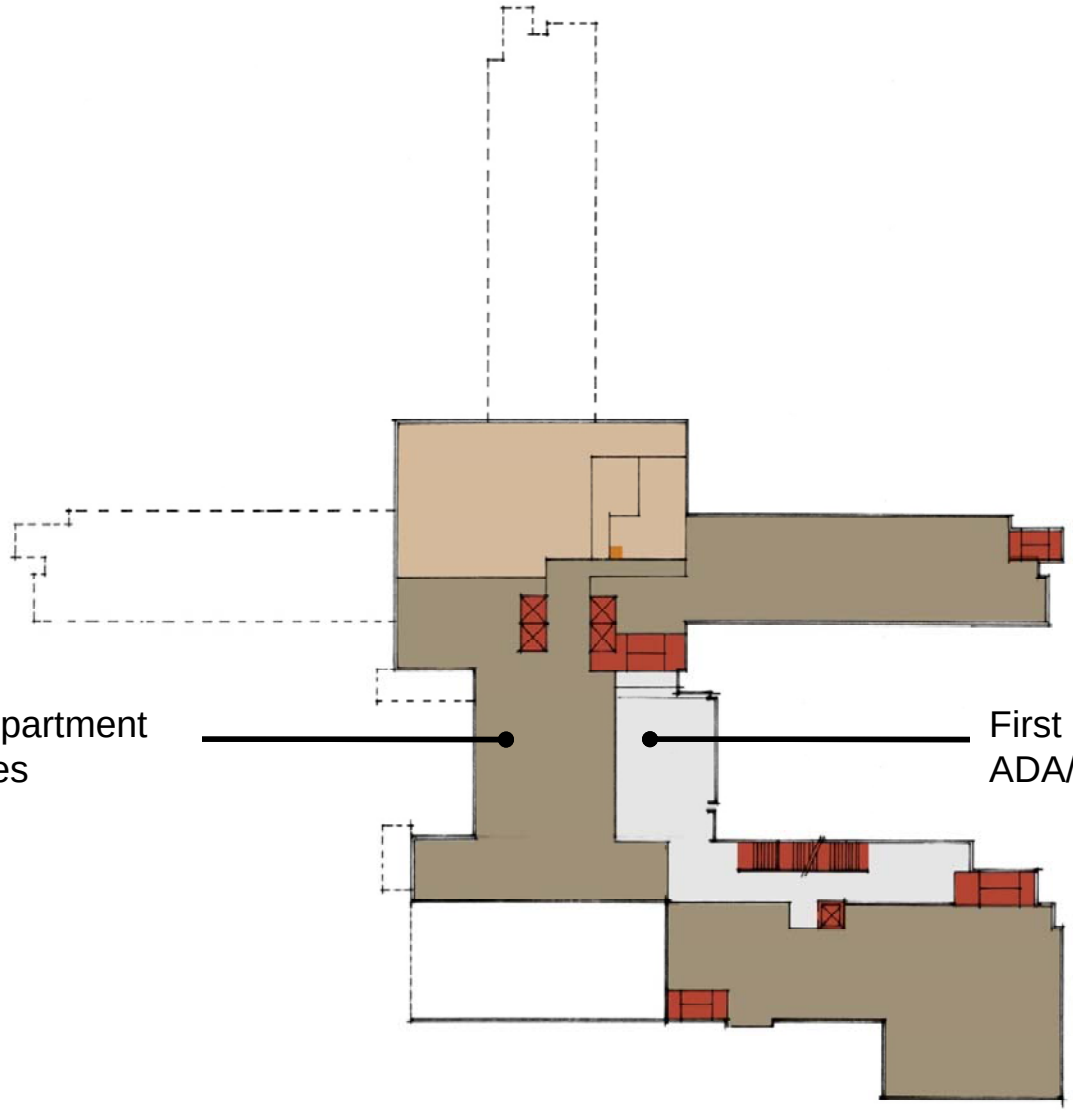
HALL STATUS	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
Hall #1	Under Reno/Constr.	Under Reno/Constr.	Under Reno/Constr.	Renovated	Renovated	Renovated	Renovated	Renovated	Renovated	Renovated
Hall #2	*On-Line*	*On-Line*	*On-Line*	*On-Line*	*On-Line*	*On-Line*	Under Reno/Constr.	Under Reno/Constr.	Under Reno/Constr.	Renovated
Hall #3	*On-Line*	*On-Line*	*On-Line*	Under Reno/Constr.	Under Reno/Constr.	Under Reno/Constr.	Renovated	Renovated	Renovated	Renovated
Total Residence Hall GSF	563,201	563,201	563,201	556,591	556,591	556,591	569,173	569,173	569,173	633,362
Renovated Beds Available	2,542	2,542	2,542	2,481	2,481	2,481	2,441	2,441	2,441	2,745
Square Feet per Bed	222 SF	222 SF	222 SF	224 SF	224 SF	224 SF	233 SF	233 SF	233 SF	231 SF
Total Square Feet	**2013/2014**	**2014/2015**	**2015/2016**	**2016/2017**	**2017/2018**	**2018/2019**	**2019/2020**	**2020/2021**	**2021/2022**	**2022/2023**
Hall #1	140,322	140,322	140,322	210,483	210,483	210,483	210,483	210,483	210,483	210,483
Hall #2	192,567	192,567	192,567	192,567	192,567	192,567	128,378	128,378	128,378	192,567
Hall #3	230,312	230,312	230,312	153,541	153,541	153,541	230,312	230,312	230,312	230,312
Total Renovated Beds	**2013/2014**	**2014/2015**	**2015/2016**	**2016/2017**	**2017/2018**	**2018/2019**	**2019/2020**	**2020/2021**	**2021/2022**	**2022/2023**
Hall #1	0	302	603	905	905	905	905	905	905	905
Hall #2	0	0	0	0	0	0	0	304	608	912
Hall #3	0	0	0	0	309	618	928	928	928	928
% of Beds Renovated	**2013/2014**	**2014/2015**	**2015/2016**	**2016/2017**	**2017/2018**	**2018/2019**	**2019/2020**	**2020/2021**	**2021/2022**	**2022/2023**
Hall #1	0%	33%	67%	100%	100%	100%	100%	100%	100%	100%
Hall #2	0%	0%	0%	0%	0%	0%	0%	33%	67%	100%
Hall #3	0%	0%	0%	0%	33%	67%	100%	100%	100%	100%

Existing nine -story Residence hall

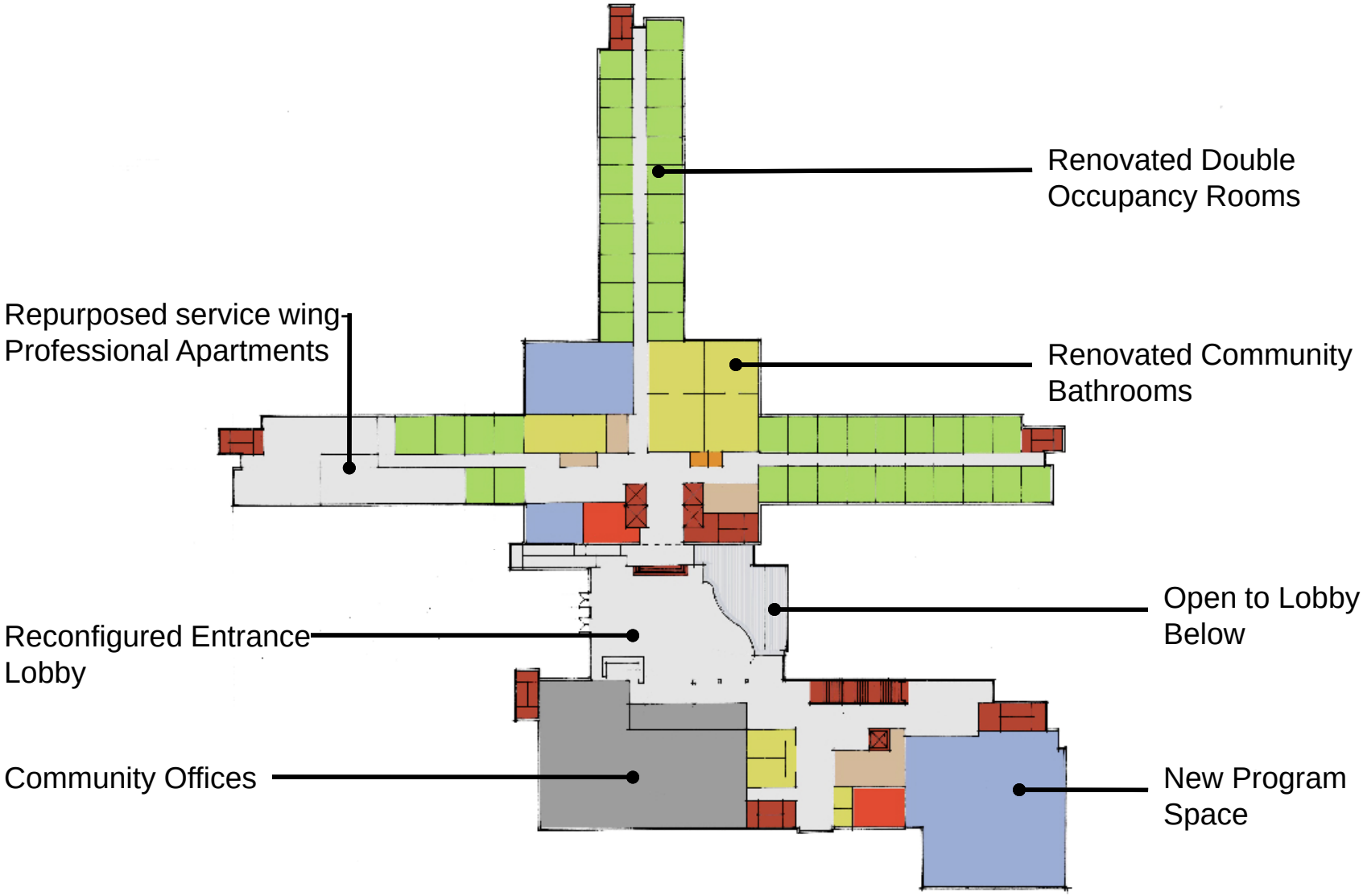


New multi-story Addition

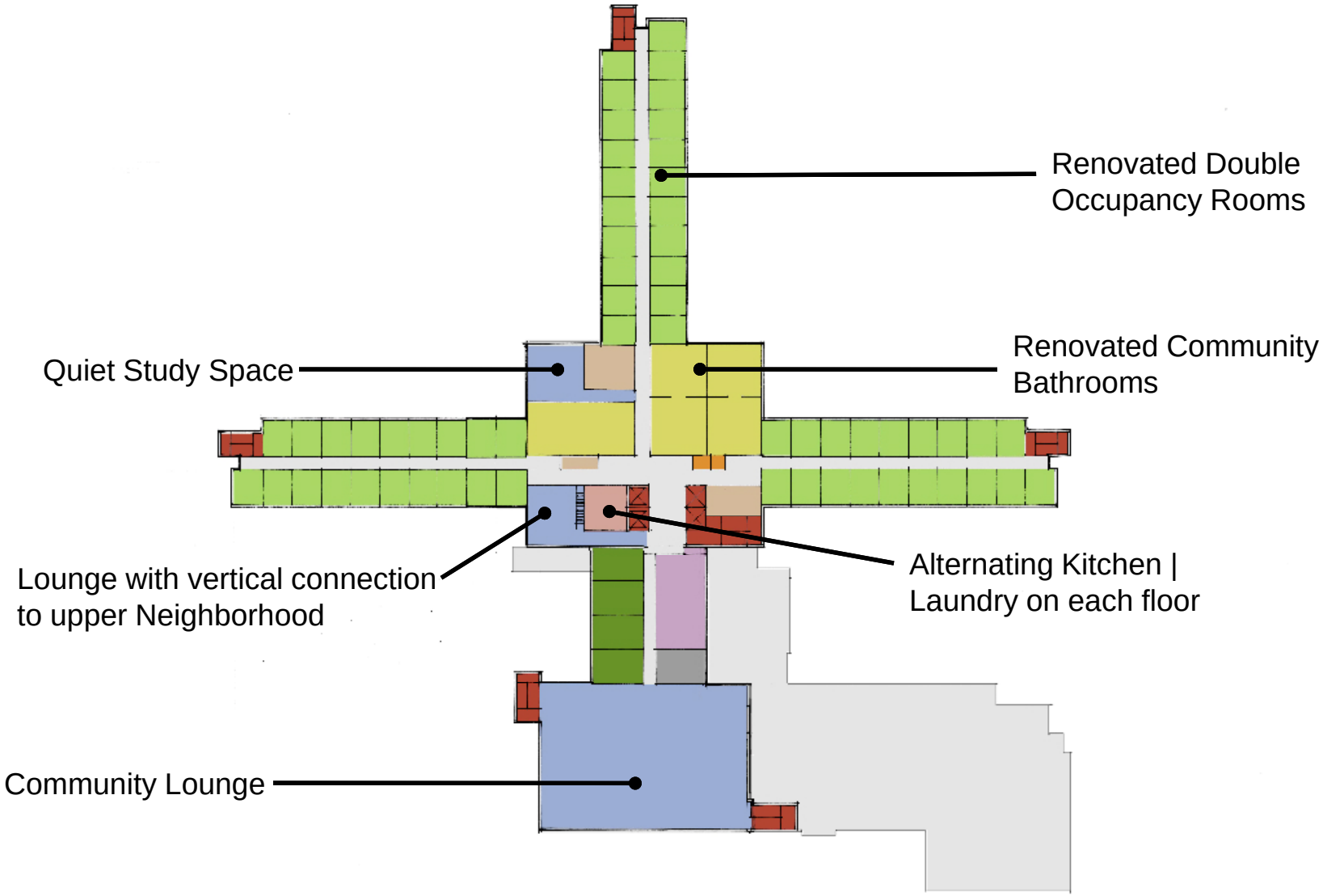
Site Plan



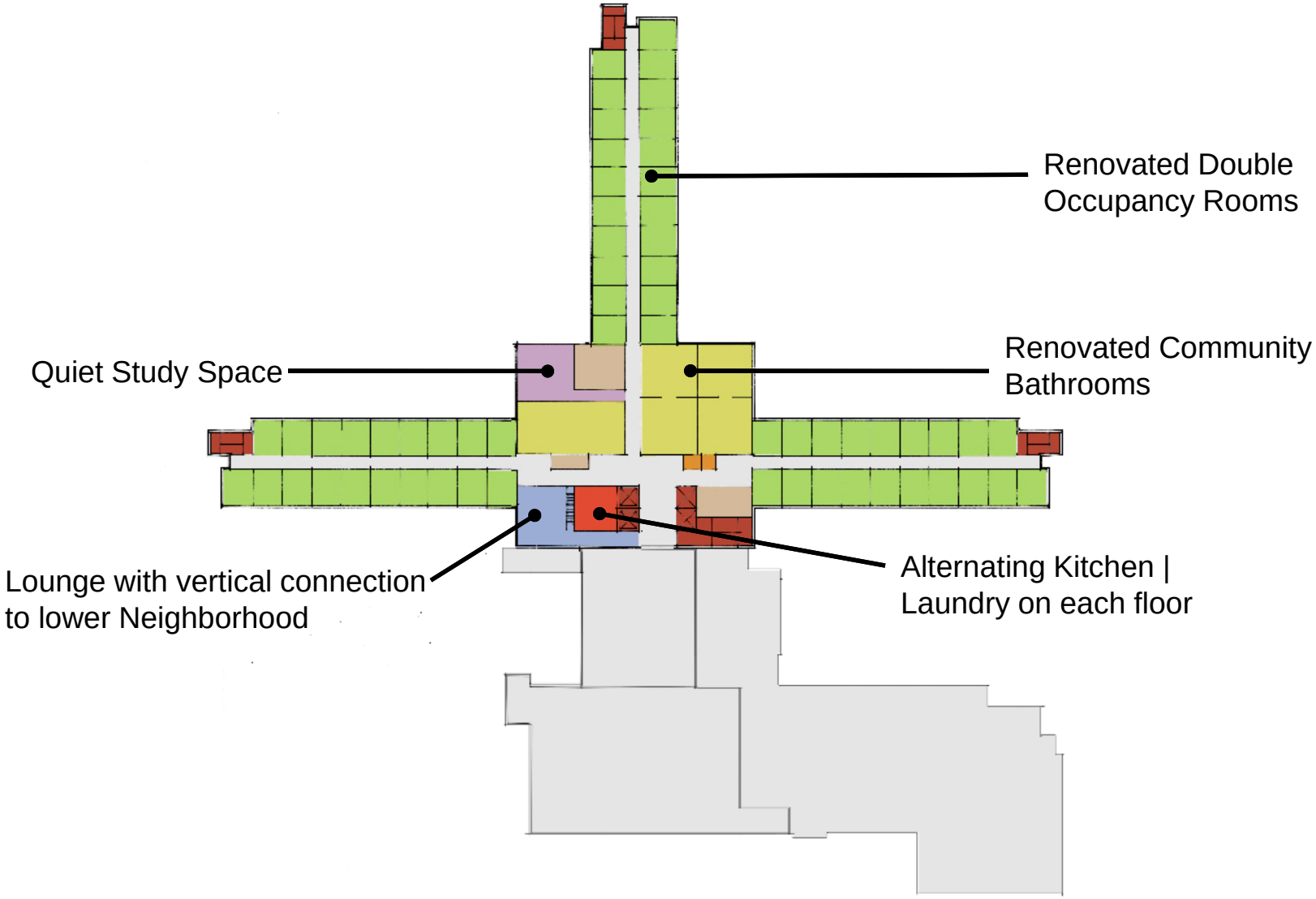
First Floor Plan



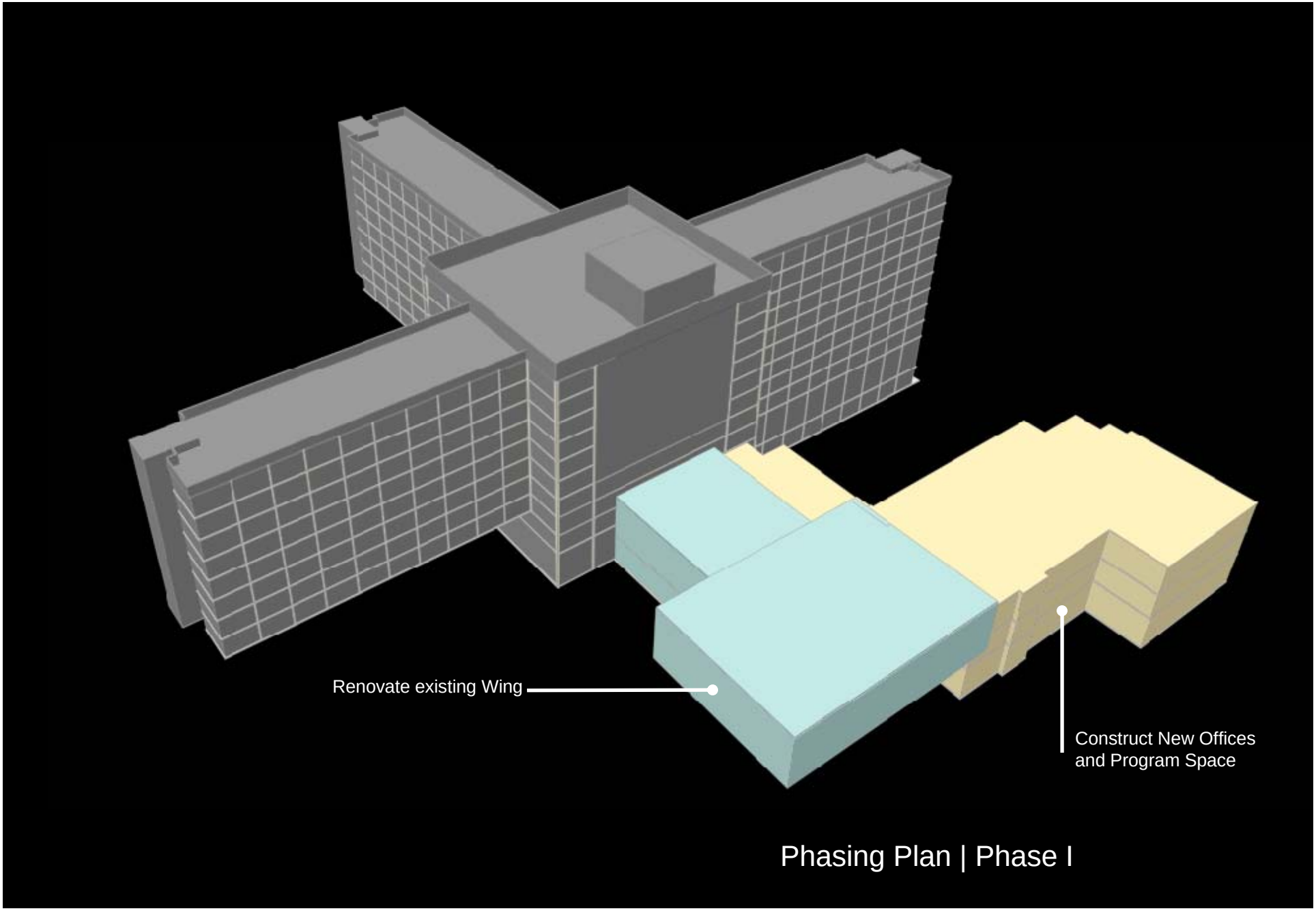
Second Floor Plan



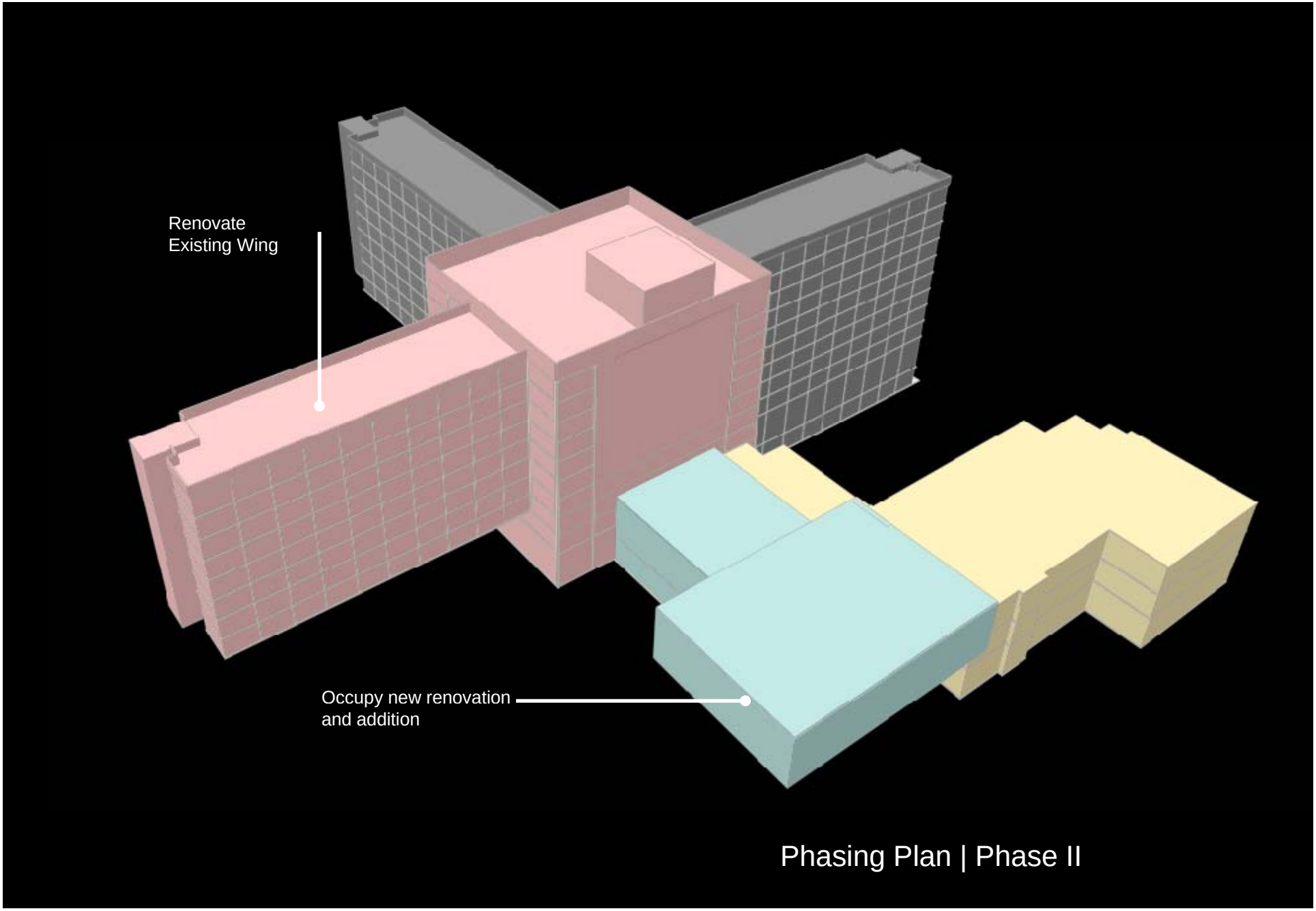
Third Floor Plan



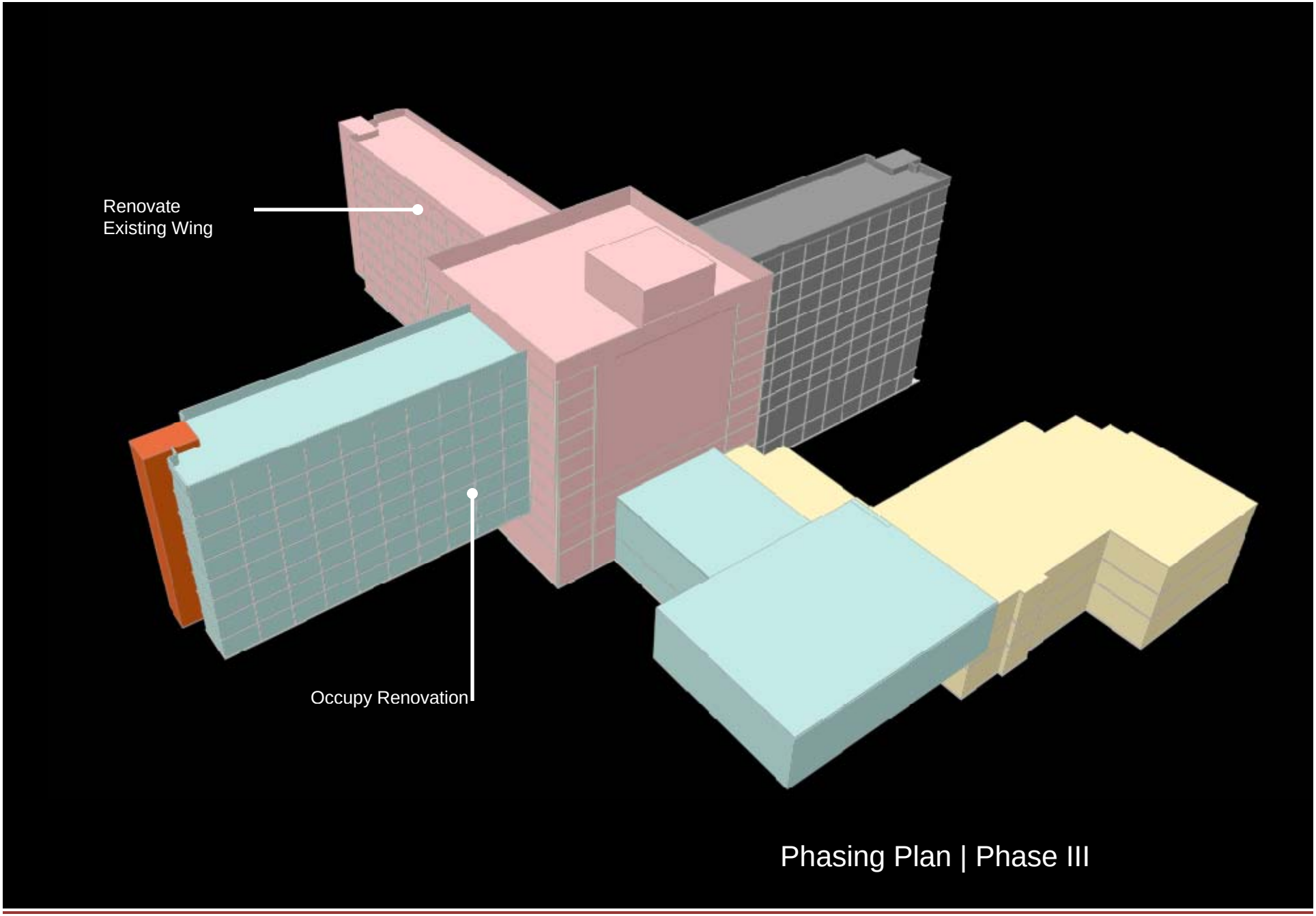
Fourth Floor Plan



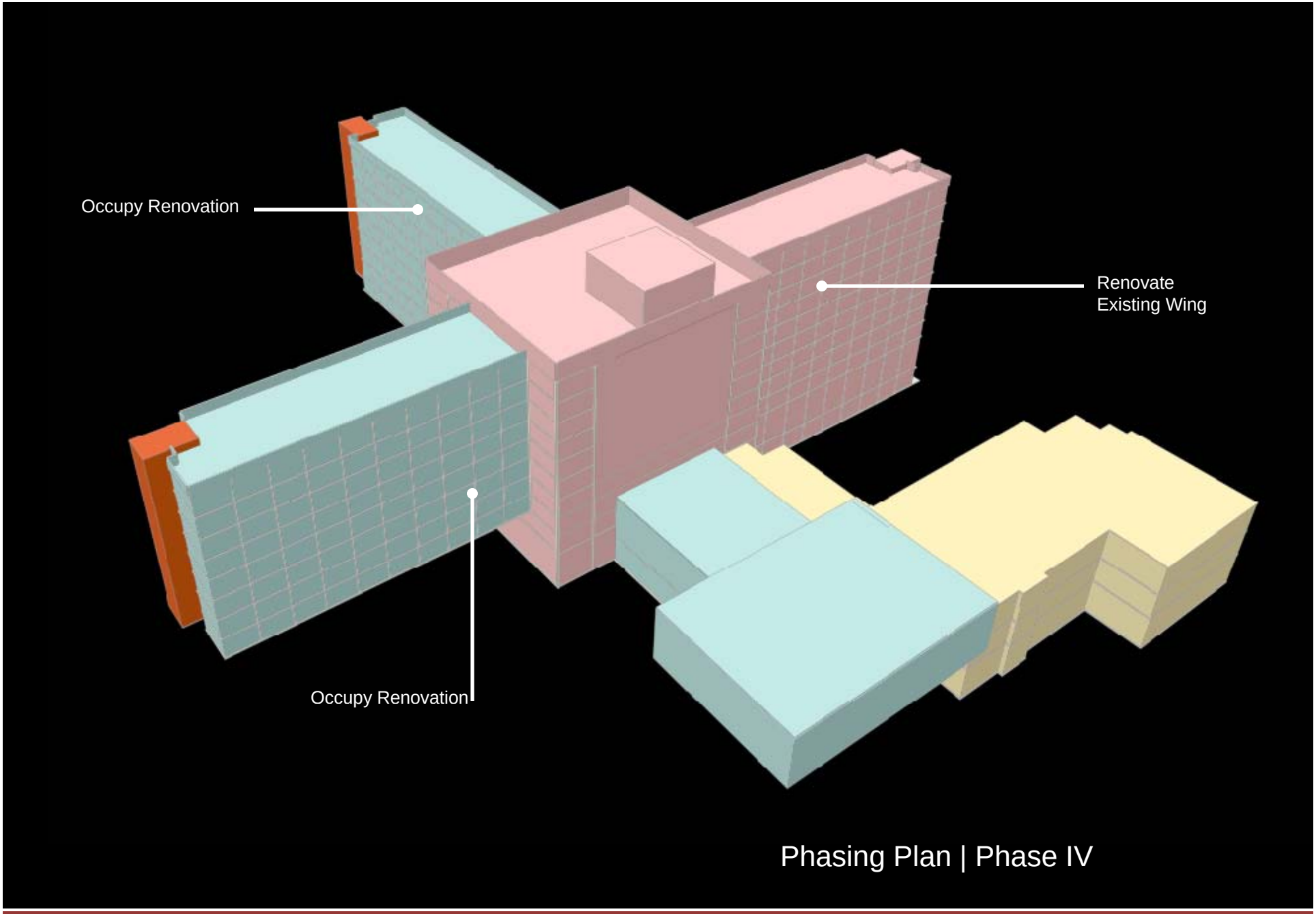
Phasing Plan | Phase I



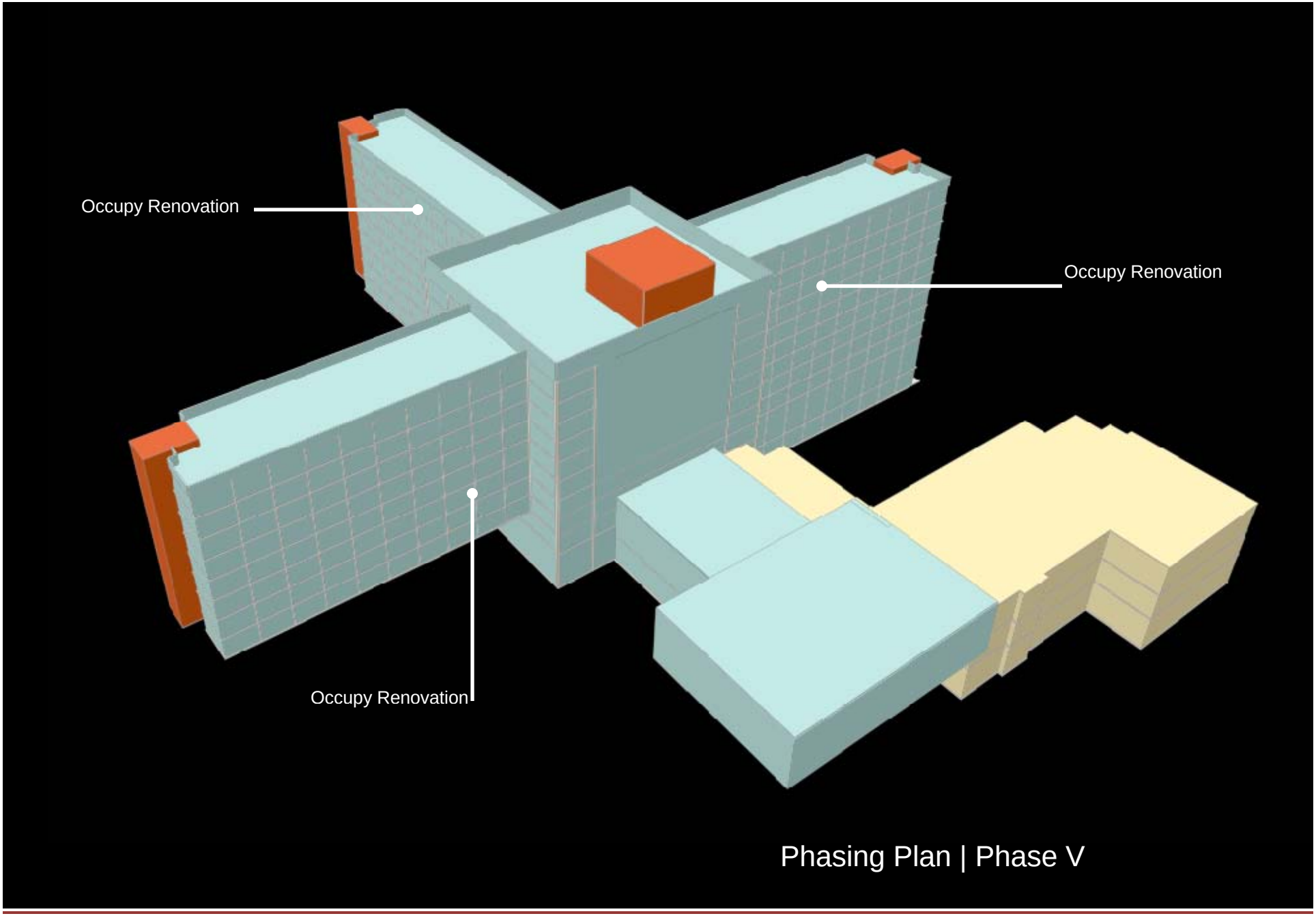
Phasing Plan | Phase II



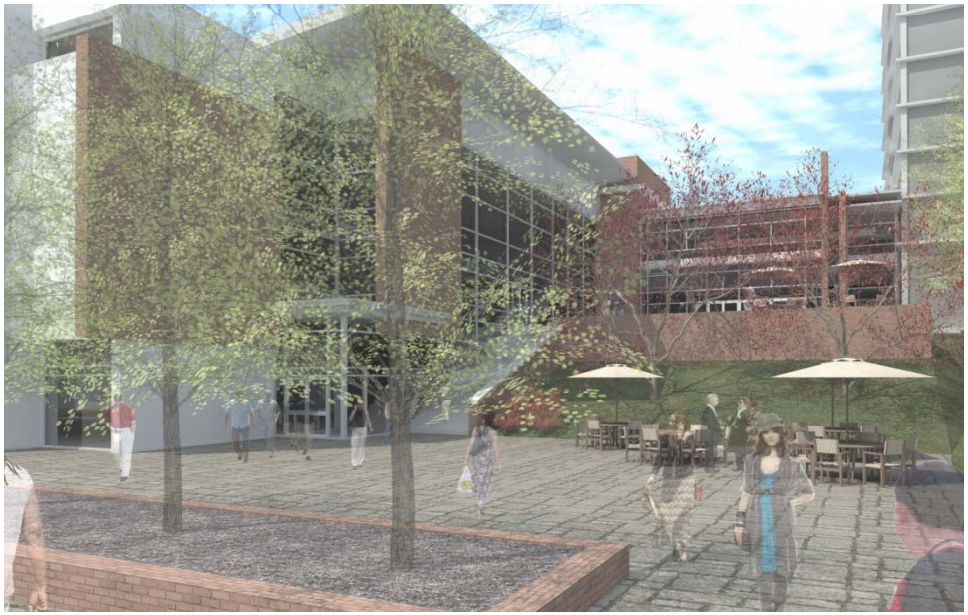
Phasing Plan | Phase III

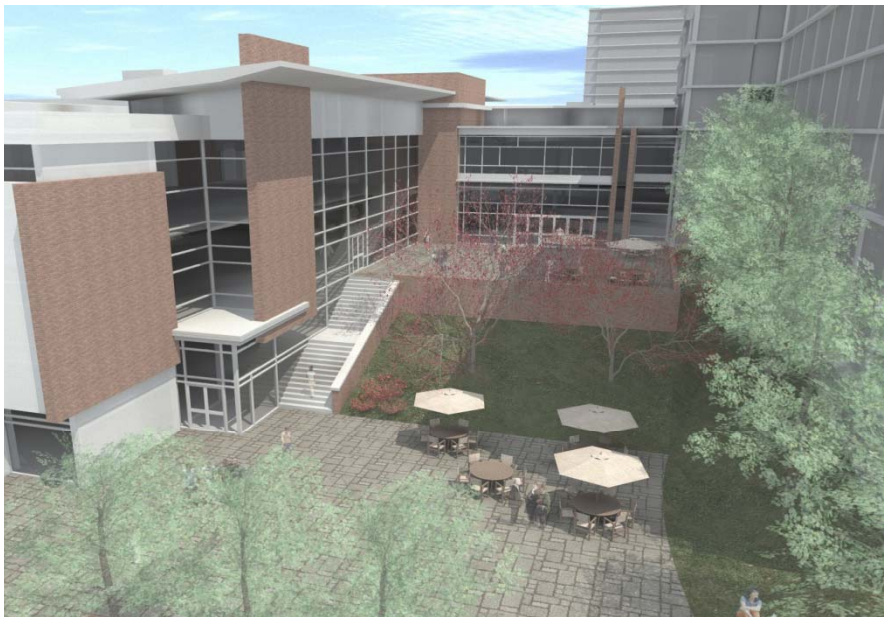


Phasing Plan | Phase IV



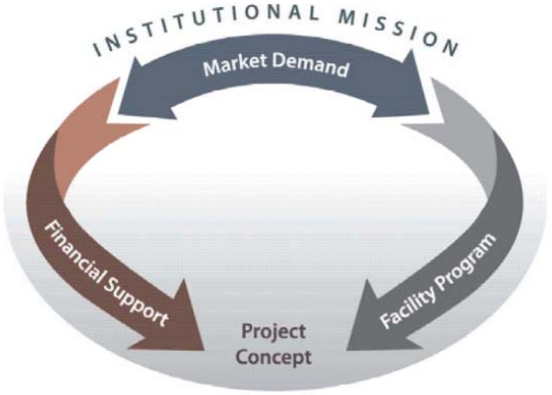
Phasing Plan | Phase V





CONSIDERATIONS

- Every Project is Different
- Process Is Important
- Knowing Existing Conditions
- Understand Your Students
- The Depth of Your Pockets
- Institutional Expectations & Requirements



Renovate or Replace...

the Process of Long-Range Planning for Mid-Century Buildings

Housing Facilities Conference

THURSDAY, OCTOBER 14, 2010

Session # 905

COLLINS COOPER CARUSI *Architects*

BRAILSFORD & DUNLAVEY