

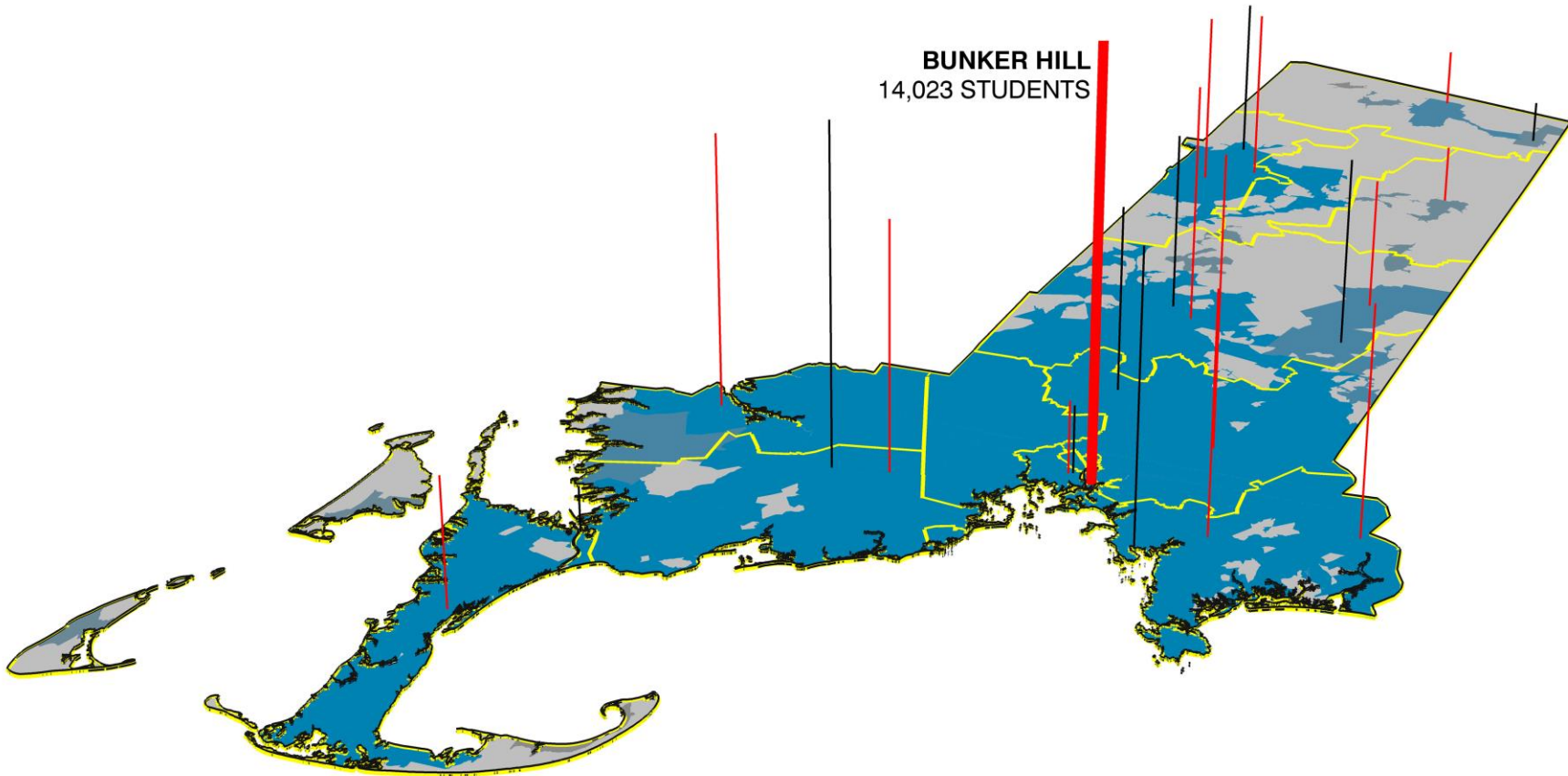
A group of students, many with backpacks, are walking away from the camera on a paved path. The path is bordered by a dark metal railing. In the background, there is a large, modern building with a grid of windows and a facade of vertical slats. Lush green trees and bushes are visible on the left side of the path. The scene is brightly lit, suggesting a sunny day.

GEODESIGN IN COMMUNITY COLLEGES
BUNKER HILL COMMUNITY COLLEGE | 2014 MASTER PLAN UPDATE

How can geodesign improve traditional planning processes for community colleges?



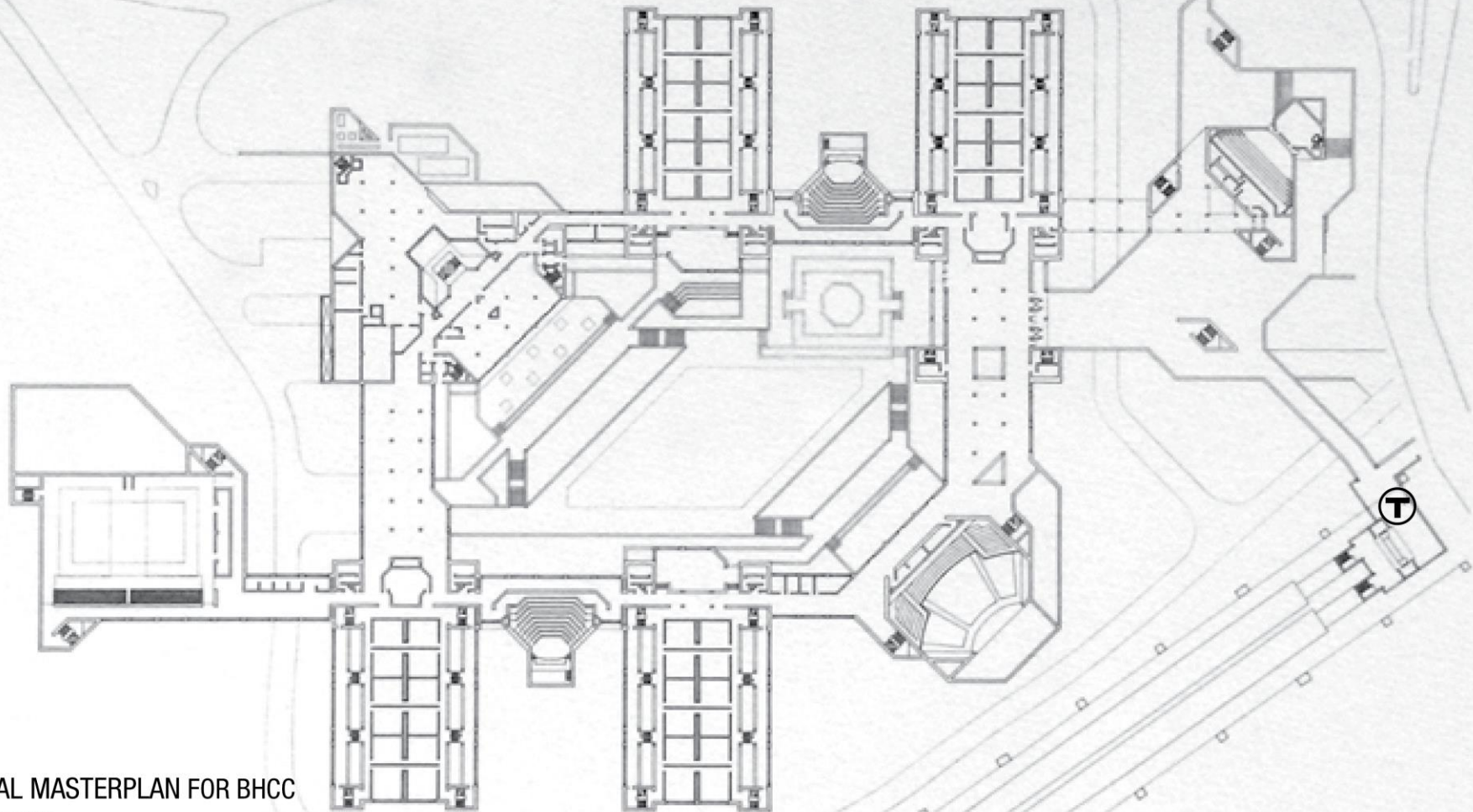




STATE-WIDE TWO-YEAR COLLEGES BY ENROLLMENT

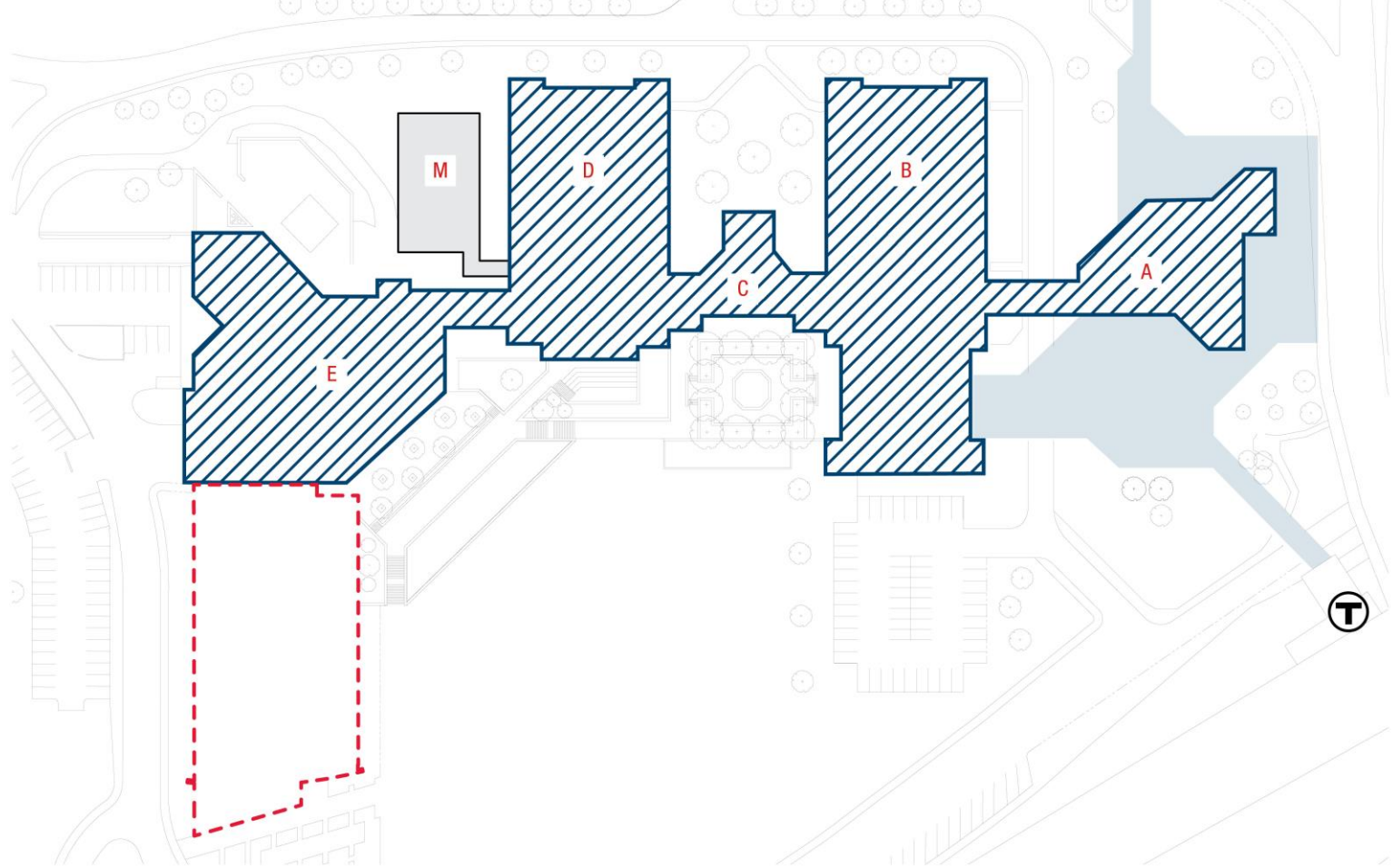
- URBAN AREAS — STATE BOUNDARY — COUNTY BOUNDARY
- COMMUNITY COLLEGES — STATE COLLEGES

SOURCES: NATIONAL CENTER FOR EDUCATION STATISTICS AND MASSGIS



ORIGINAL MASTERPLAN FOR BHCC

SOURCE: BHCC



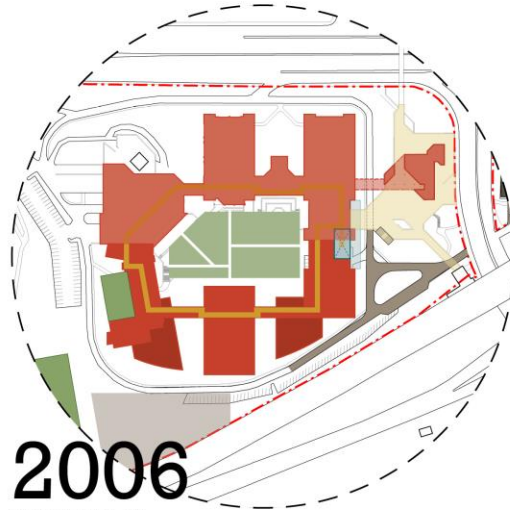
CONSTRUCTED BHCC MAIN CAMPUS

SOURCE: BHCC



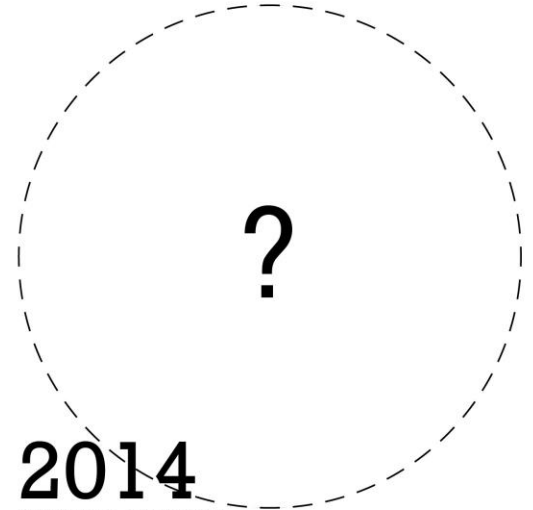
1973

ORIGINAL MASTER PLAN
SHEPLEY BULLFINCH RICHARDSON



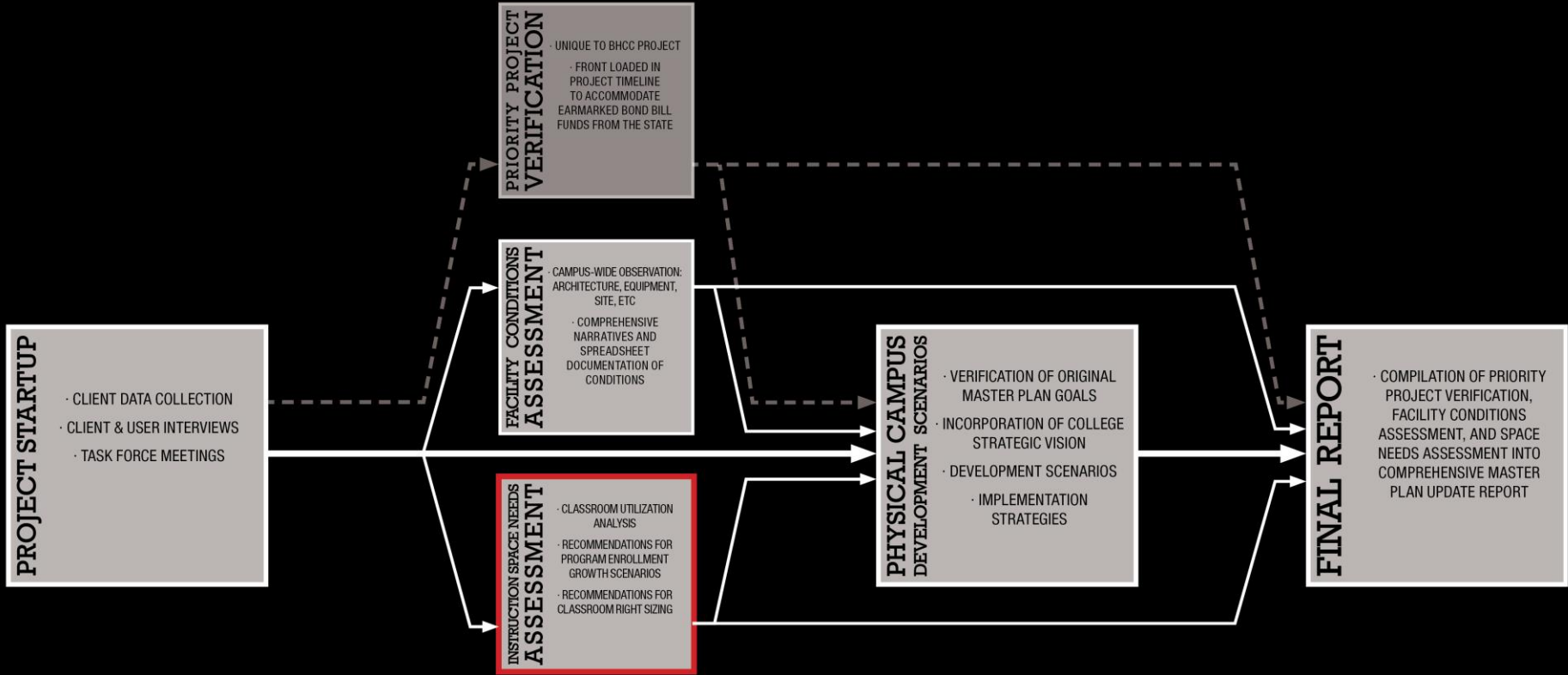
2006

MASTER PLAN
CHAN KRIEGER SIENIEWICZ



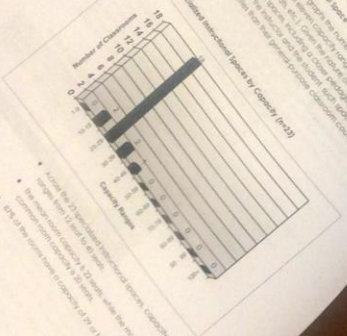
2014

MASTER PLAN UPDATE
NBBJ



4.4 Specialized Instructional Space Capacity and Course Enrollment

Figure 3
Number of Distinct Courses by Capacity (n=210)



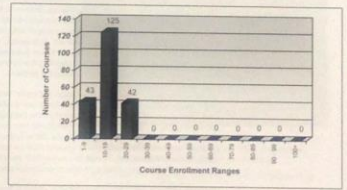
- Across the 210 specialized instructional spaces, capacity ranges from 2 to 25 students, with the most common enrollment capacity being 3 students.
- 80% of the courses have an enrollment of 19 or fewer students.

Specialized Instructional Spaces
 Government Accountability Center

Course Enrollment

The following figure graphs the number of distinct courses in each of eleven course enrollment ranges (e.g., 1-4 students, 10-19 students, 20-29 students, etc.), calculating the ranges in room capacities.

Figure 4
 Number of Distinct Courses by Course Enrollment (n=210)



- Across the 210 courses under study, course enrollment ranges from 2 students to 26 students.
- The median enrollment is 15 students, while the most common enrollment size is 14 students.
- 80% of the courses have an enrollment of 19 or fewer, in contrast to the room capacities, where 10% of the rooms seat 19 or fewer.

80% of the courses enroll 19 or fewer students

Space Utilization Analysis

BHS002 811

Space Utilization Analysis

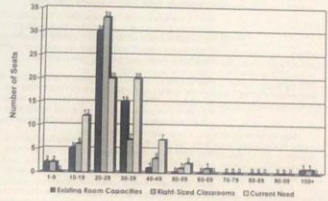
1.1 **Mean-Centered Recommendations for General Purpose Classrooms**

General purpose classrooms are the most common type of classroom in a college. They are used for a wide variety of courses and are typically the largest and most expensive type of classroom. The following table provides mean-centered recommendations for general purpose classrooms based on the number of seats. The table is based on a survey of 100 general purpose classrooms at 100 colleges and universities. The table shows the number of seats, the number of classrooms, and the number of seats per classroom. The table also shows the number of classrooms that are larger than the mean, the number of classrooms that are smaller than the mean, and the number of classrooms that are within one standard deviation of the mean.

Table 1: Mean-Centered Recommendations for General Purpose Classrooms

Number of Seats	Number of Classrooms	Number of Seats per Classroom	Number of Classrooms Larger than Mean	Number of Classrooms Smaller than Mean	Number of Classrooms within 1 SD of Mean
1-5	1	1	0	1	1
6-10	2	8	0	2	2
11-15	3	12	0	3	3
16-20	4	16	0	4	4
21-25	5	20	0	5	5
26-30	6	24	0	6	6
31-35	7	28	0	7	7
36-40	8	32	0	8	8
41-45	9	36	0	9	9
46-50	10	40	0	10	10
51-55	11	44	0	11	11
56-60	12	48	0	12	12
61-65	13	52	0	13	13
66-70	14	56	0	14	14
71-75	15	60	0	15	15
76-80	16	64	0	16	16
81-85	17	68	0	17	17
86-90	18	72	0	18	18
91-95	19	76	0	19	19
96-100	20	80	0	20	20

Figure 2: Existing Classrooms Compared to Right-Sized Classrooms and Current Need by Number of Seats



At GCC, there is an overage of 210 defined. On an individual basis, one room may be too tight, suggesting that the excess seats need to be discarded, or another room may have the physical capacity to accommodate additional seats.

The hypothetical exercise would shift the distribution of classroom capacities toward the smaller end of the scale, which would result in too many small rooms, especially classrooms with capacities of 20 to 29. It does, however, result in a handful of larger capacity rooms, which are needed. This latter change can be accomplished through the physical addition of an appropriate number of seats. Again, these are general guidelines and do not take into account institution specific issues such as faculty contracts or geographical assignments.

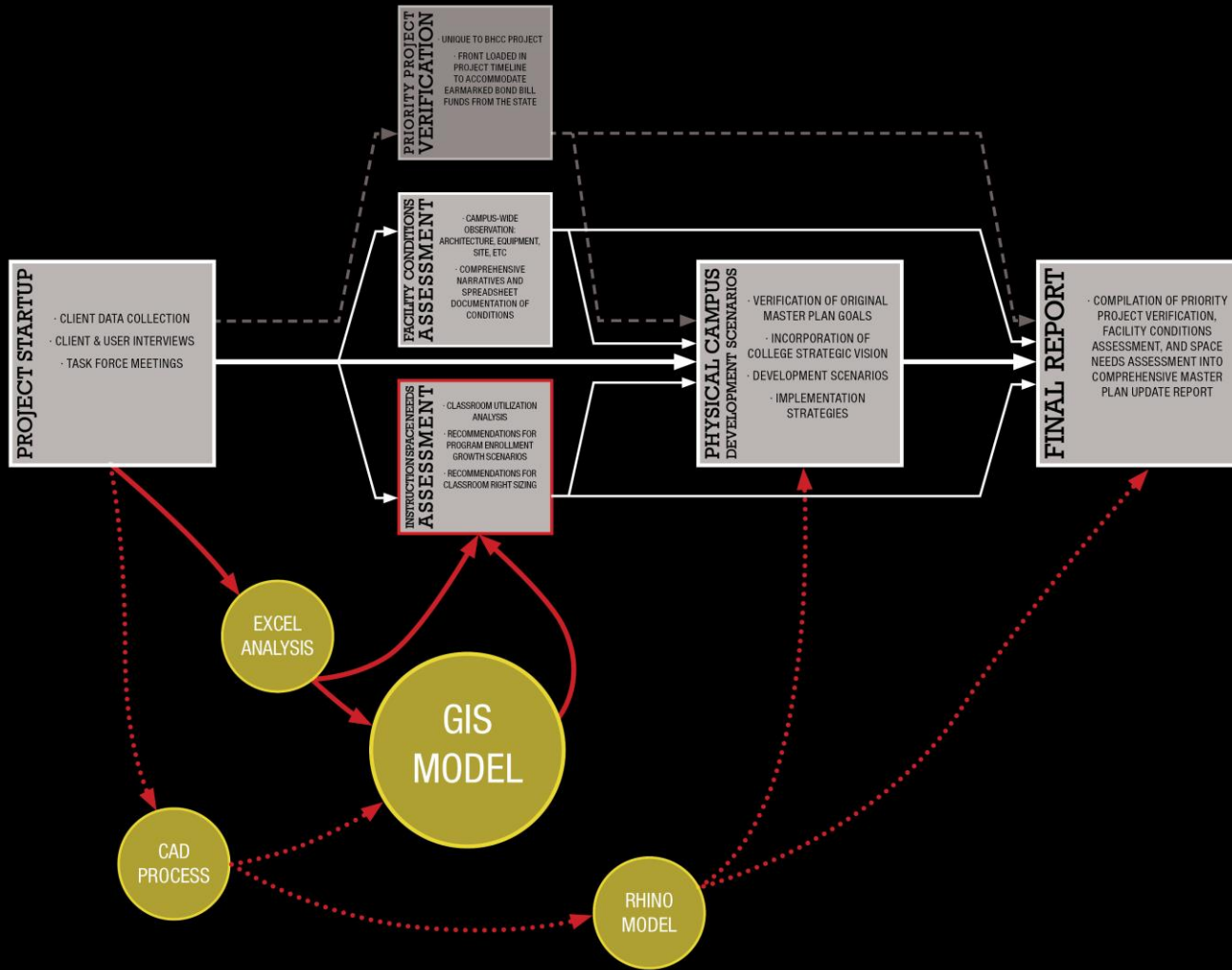
Areas requiring additional review are those spaces with significantly fewer seats than expected, such as AC111 or BS3. Additional situations such as the may point to a possible miscalculation of the space or incorrect data regarding either square footage or original seat counts.

It is evident that the right-sizing recommendation cannot be instituted in isolation, but has to take into consideration current

ADDITION OF DESIGN COMPUTATION TOOLS INTO PROCESS

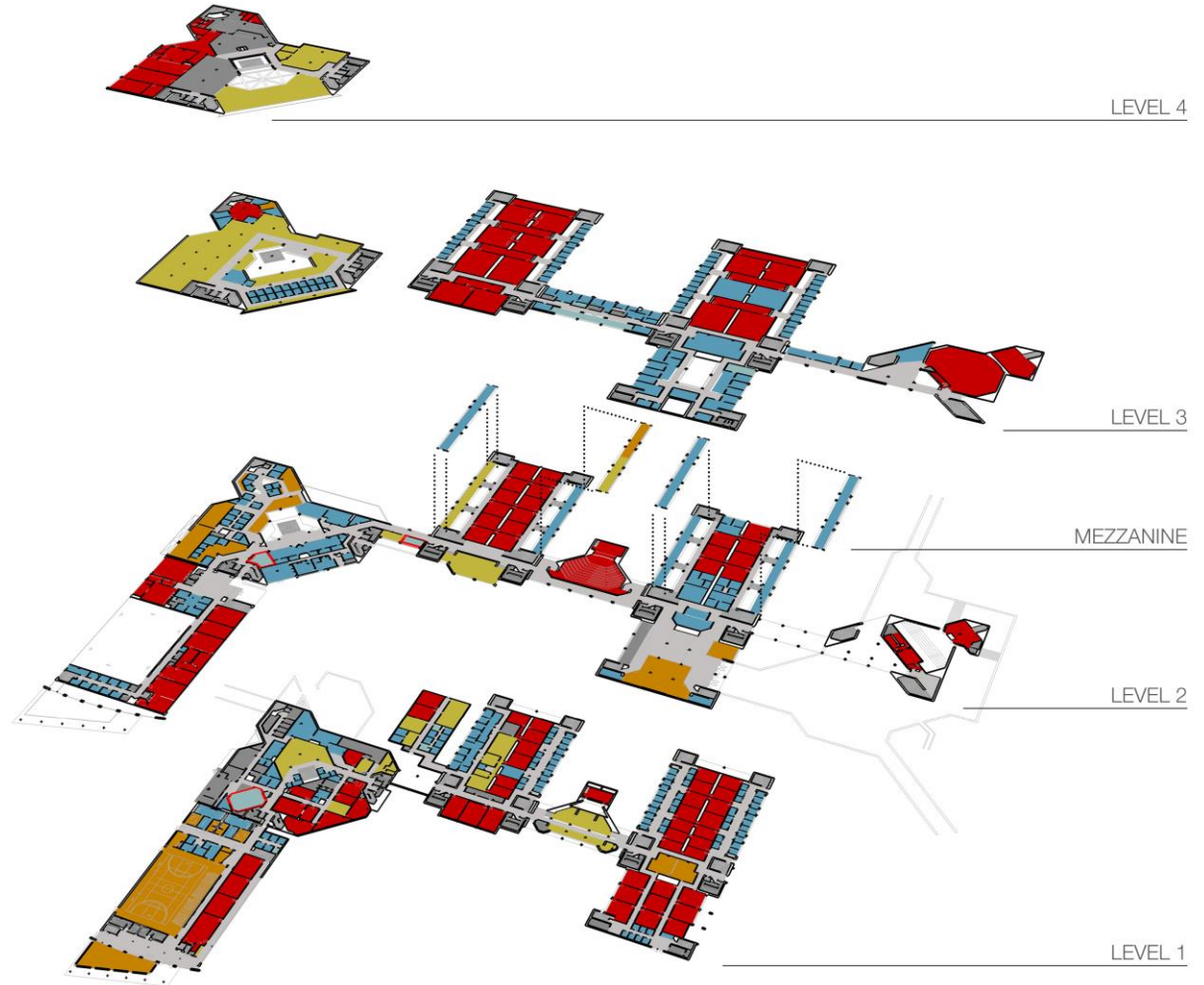
TYPICAL MASTER PLAN UPDATE PROCESS

BHCC-SPECIFIC TASK



1. to better understand how the campus functions
2. to discover patterns and trends over time
3. to communicate more effectively with the college

- INSTRUCTION & ASSOCIATED PREP SPACE
- ADMINISTRATION-OFFICES & SUPPORT
- STUDENT SPACES
- CIRCULATION
- FACILITIES
- STUDENT SERVICES
- CONFERENCE/INSTRUCTION



LEVEL 4

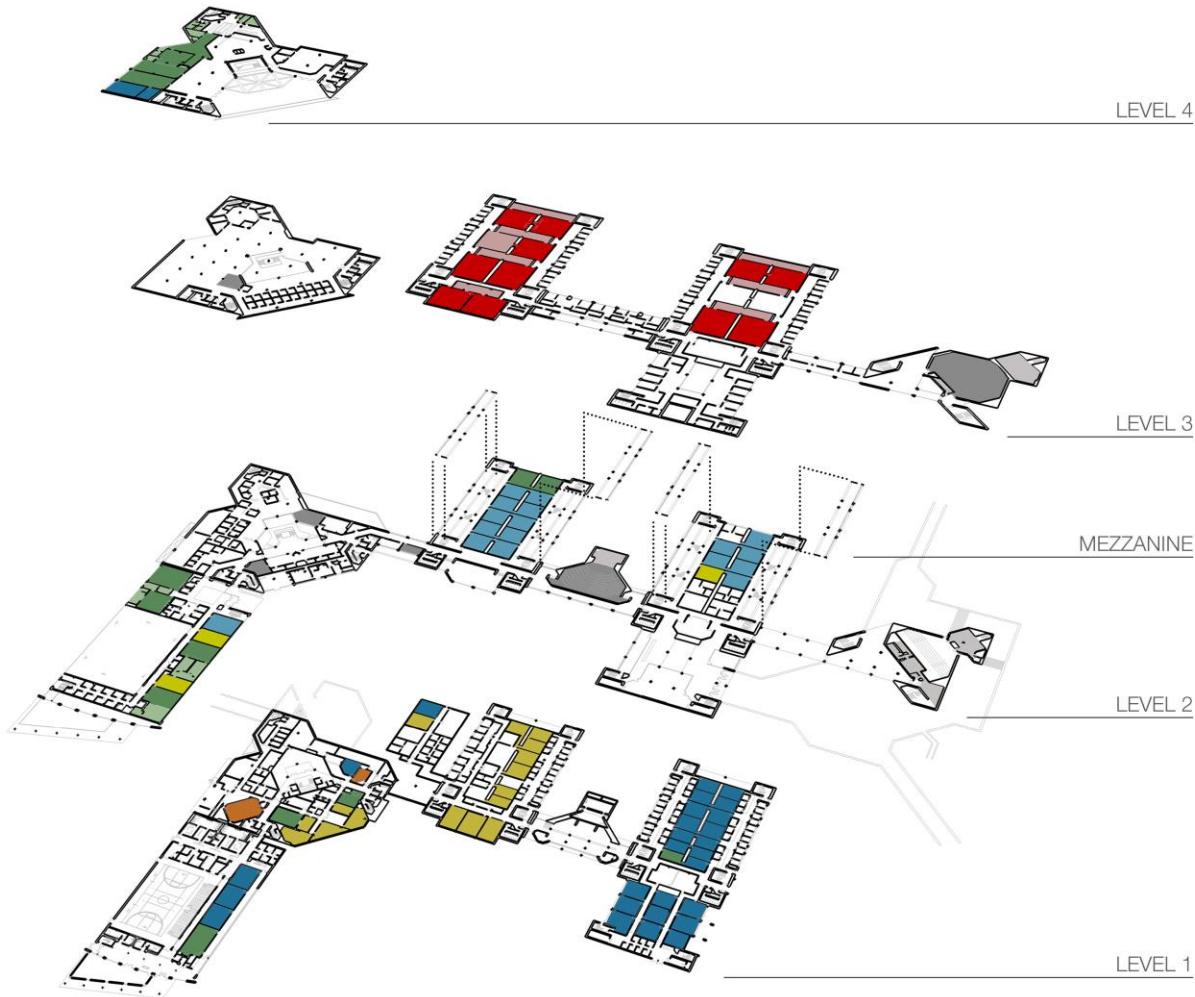
LEVEL 3

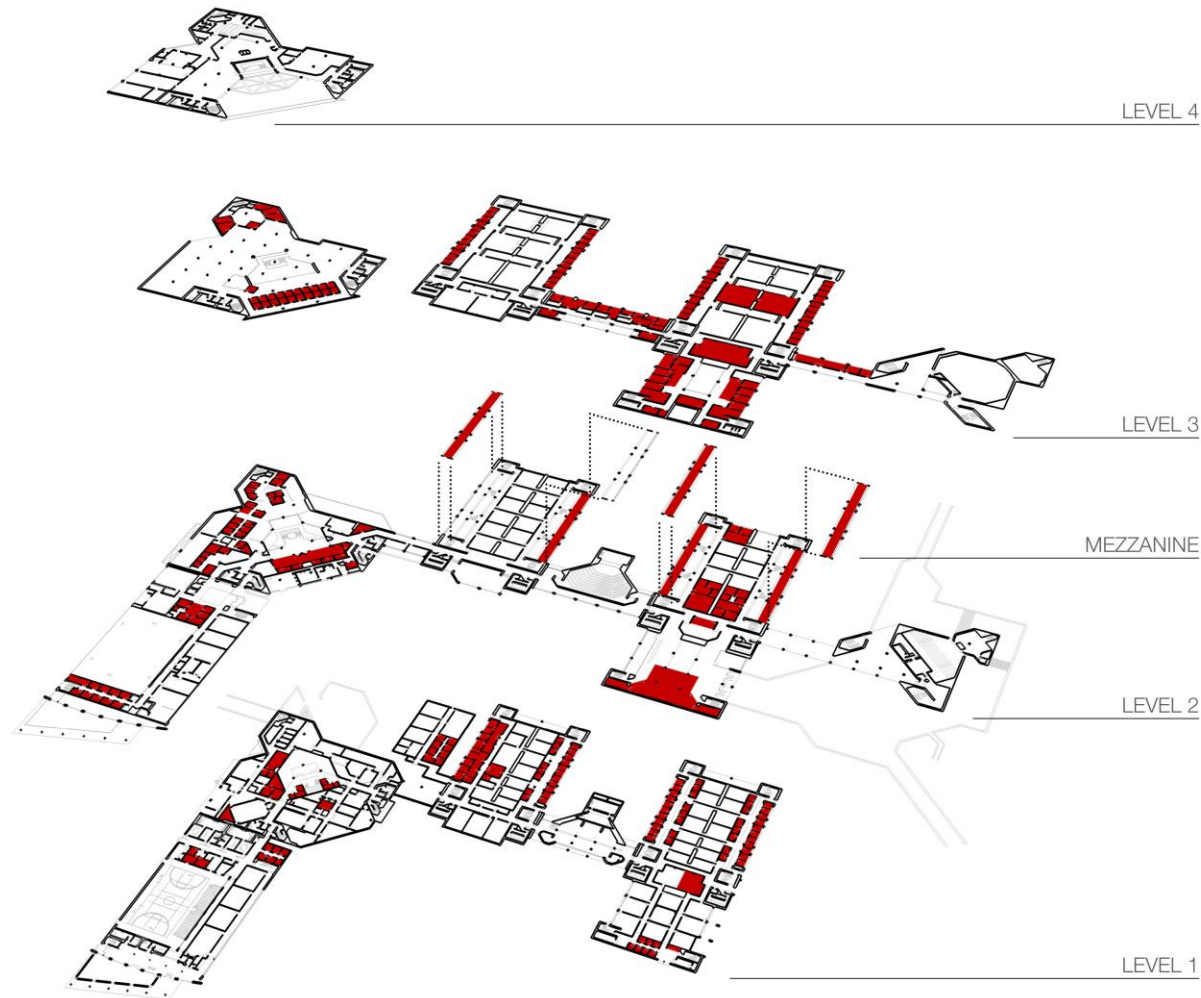
MEZZANINE

LEVEL 2

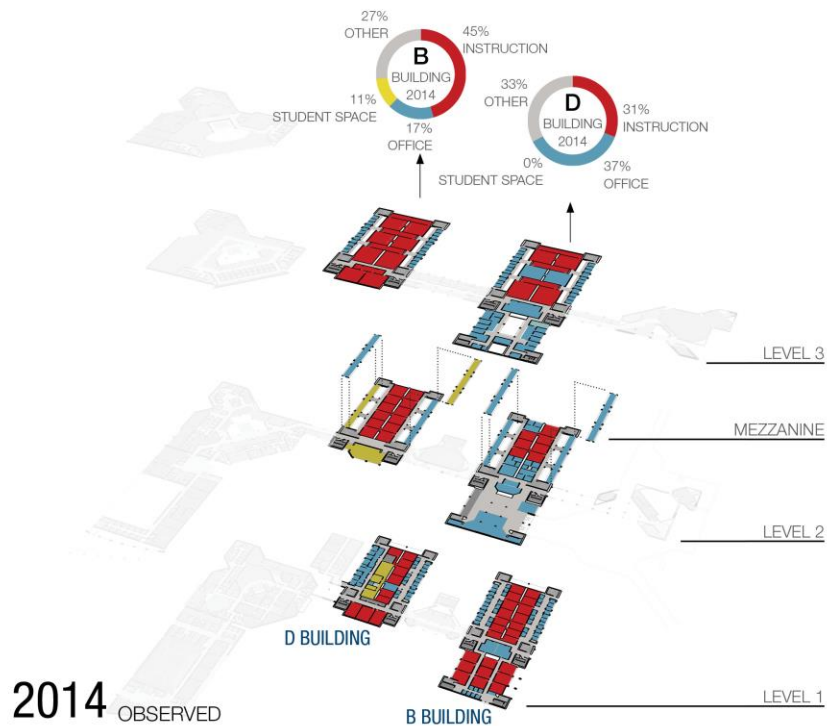
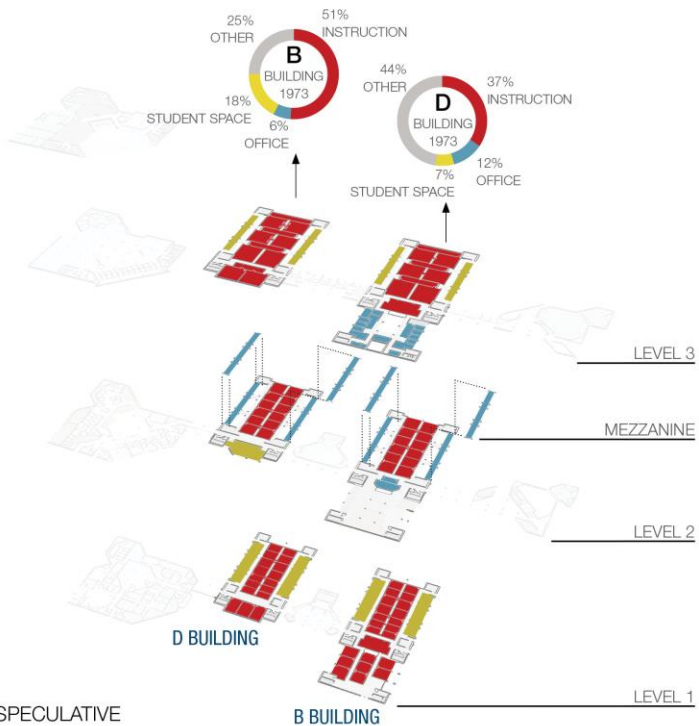
LEVEL 1

- SCIENCE LAB
- LAB PREP SPACE
- SPECIALIZED CLASSROOM
- SPECIALIZED CLASSROOM PREP SPACE
- GENERAL CLASSROOMS
- COMPUTER LABS

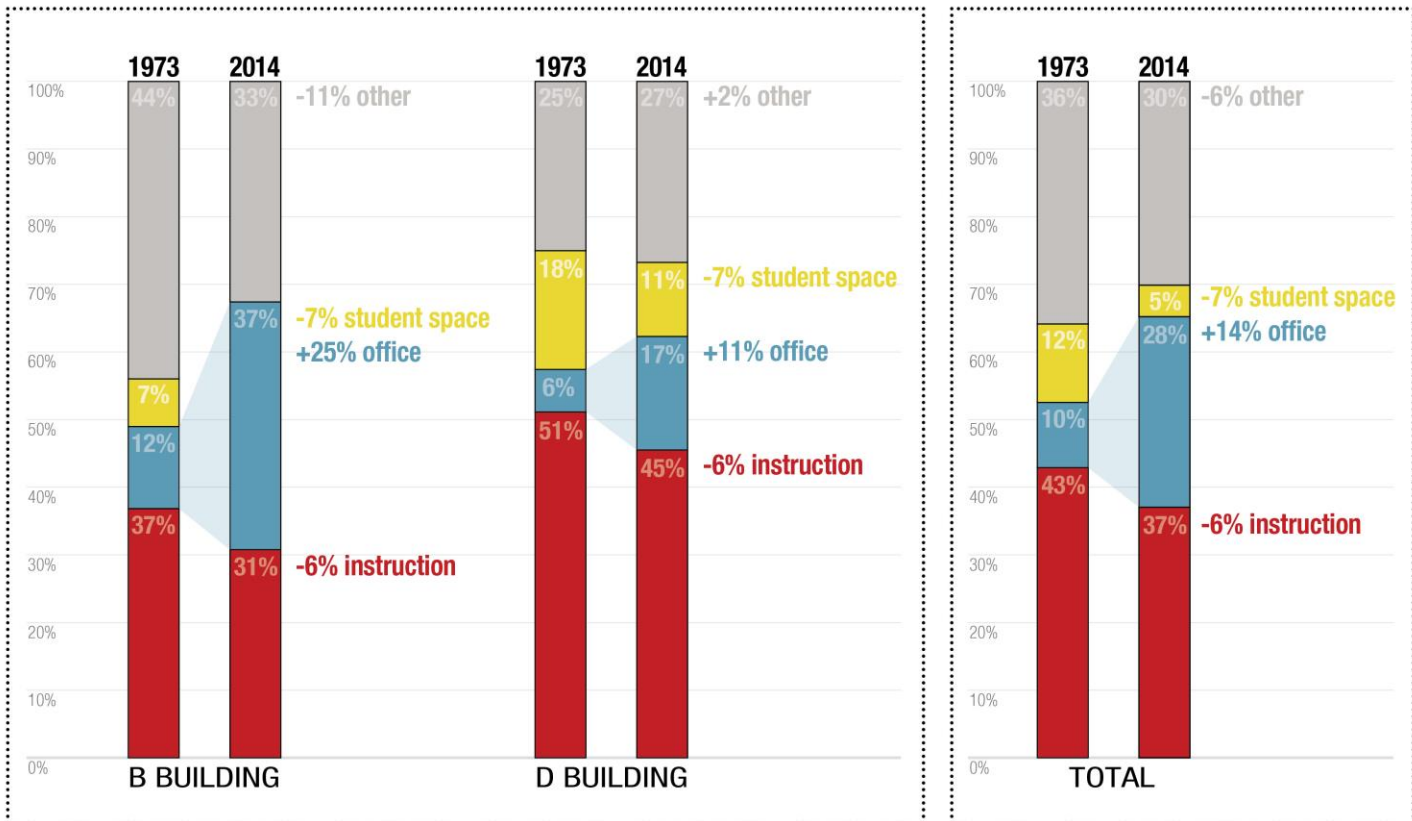




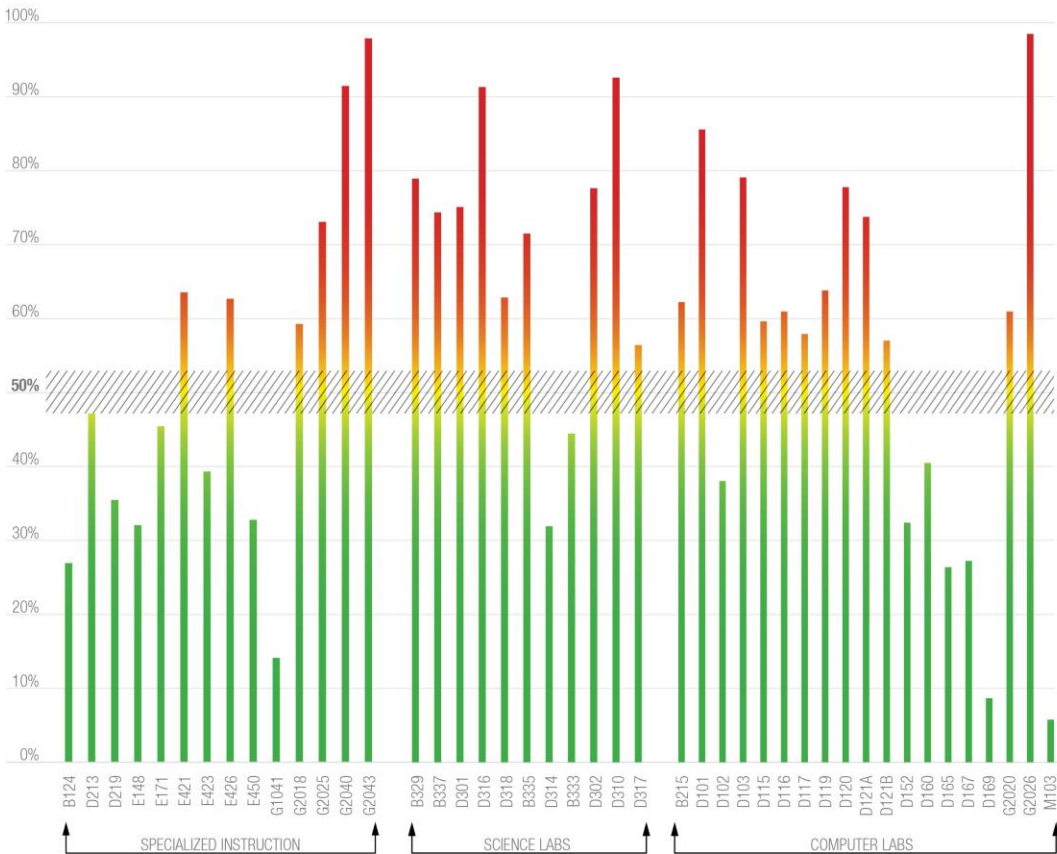
- INSTRUCTION & ASSOCIATED PREP SPACE
- ADMINISTRATION-OFFICES & SUPPORT
- STUDENT SPACES
- OTHER



SPACE MAPPING: PROGRAMMATIC SHIFTS OVER TIME



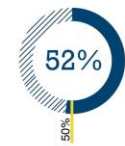
SPACE MAPPING: PROGRAMMATIC SHIFTS OVER TIME



SPACE MAPPING: CLASSROOM UTILIZATION STUDY

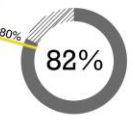
SPECIALIZED CLASSROOM ROOM UTILIZATION

The specialized classroom room utilization benchmark for similar college campuses nationwide is 50%. BHCC's Charlestown Campus averages 52% utilization.



SPECIALIZED CLASSROOM SEAT OCCUPANCY

The specialized classroom seat occupancy benchmark for similar college campuses nationwide is 80%. BHCC's Charlestown Campus averages 82% utilization.



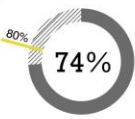
SCIENCE LAB ROOM UTILIZATION

The science lab room utilization benchmark for similar college campuses nationwide is 50%. BHCC's Charlestown Campus averages 69% utilization.



SCIENCE LAB SEAT OCCUPANCY

The science lab seat occupancy benchmark for similar college campuses nationwide is 80%. BHCC's Charlestown Campus averages 74% utilization.



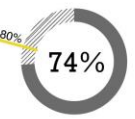
COMPUTER LAB ROOM UTILIZATION

The computer lab room utilization benchmark for similar college campuses nationwide is 50%. BHCC's Charlestown Campus averages 69% utilization.

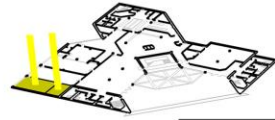


COMPUTER LAB SEAT OCCUPANCY

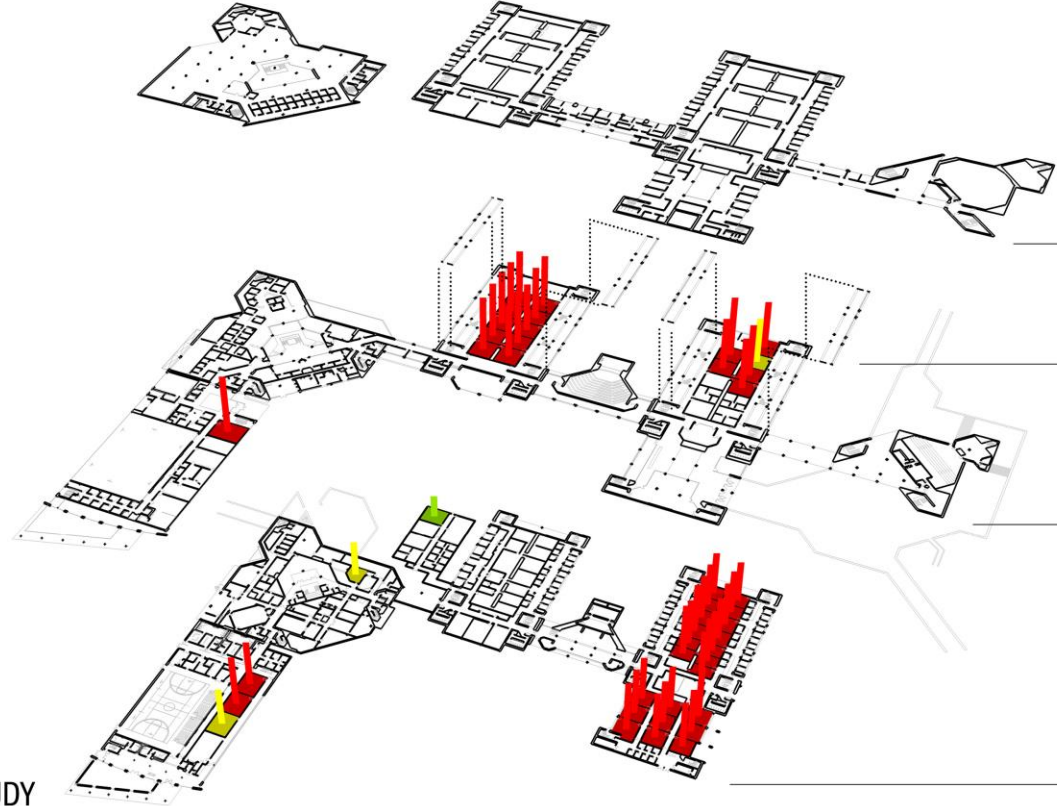
The computer lab seat occupancy benchmark for similar college campuses nationwide is 80%. BHCC's Charlestown Campus averages 74% utilization.



- OVERUTILIZED
- +/- 5% OF 50% UTILIZATION BENCHMARK
- UNDERUTILIZED



LEVEL 4



LEVEL 3

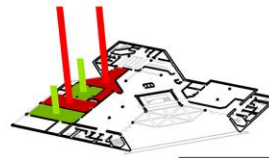
MEZZANINE

LEVEL 2

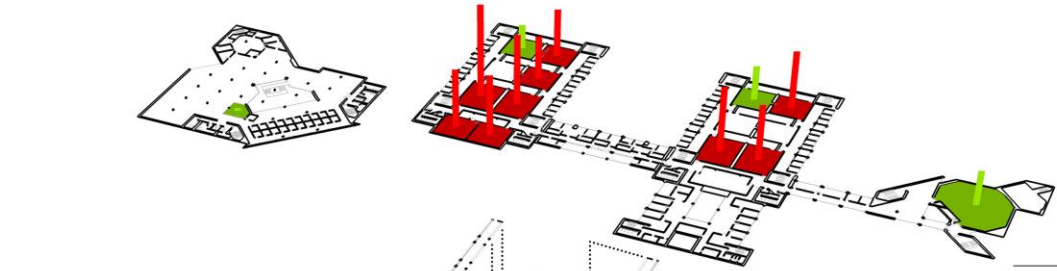
LEVEL 1

SPACE MAPPING: CLASSROOM UTILIZATION STUDY

- OVERUTILIZED
- +/- 5% OF 50% UTILIZATION BENCHMARK
- UNDERUTILIZED

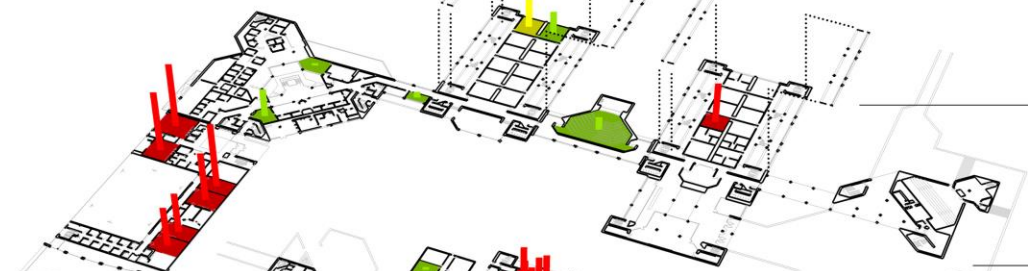


LEVEL 4



LEVEL 3

MEZZANINE



LEVEL 2

LEVEL 1

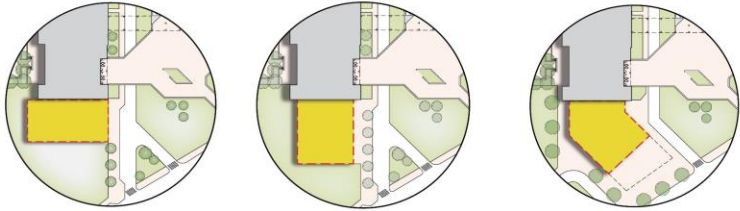
SPACE MAPPING: CLASSROOM UTILIZATION STUDY

Drawing Prep – Featureclasses in CAD

The screenshot displays the AutoCAD 2012 interface with the ArcGIS for AutoCAD extension. The main drawing area shows a floor plan with rooms labeled with numbers and square footages. The Properties panel on the left is open to the 'RMS' section, showing a table of fields:

Name	Type	Default Value	Text Size
FACFLOOR	Text	1027_01	0
FACNUM	Text	1027	0
FACROOM	Text		0
FLOOR	Text	01	0
ROOM_AREA	Text		0
ROOM_NUMBER	Text		0

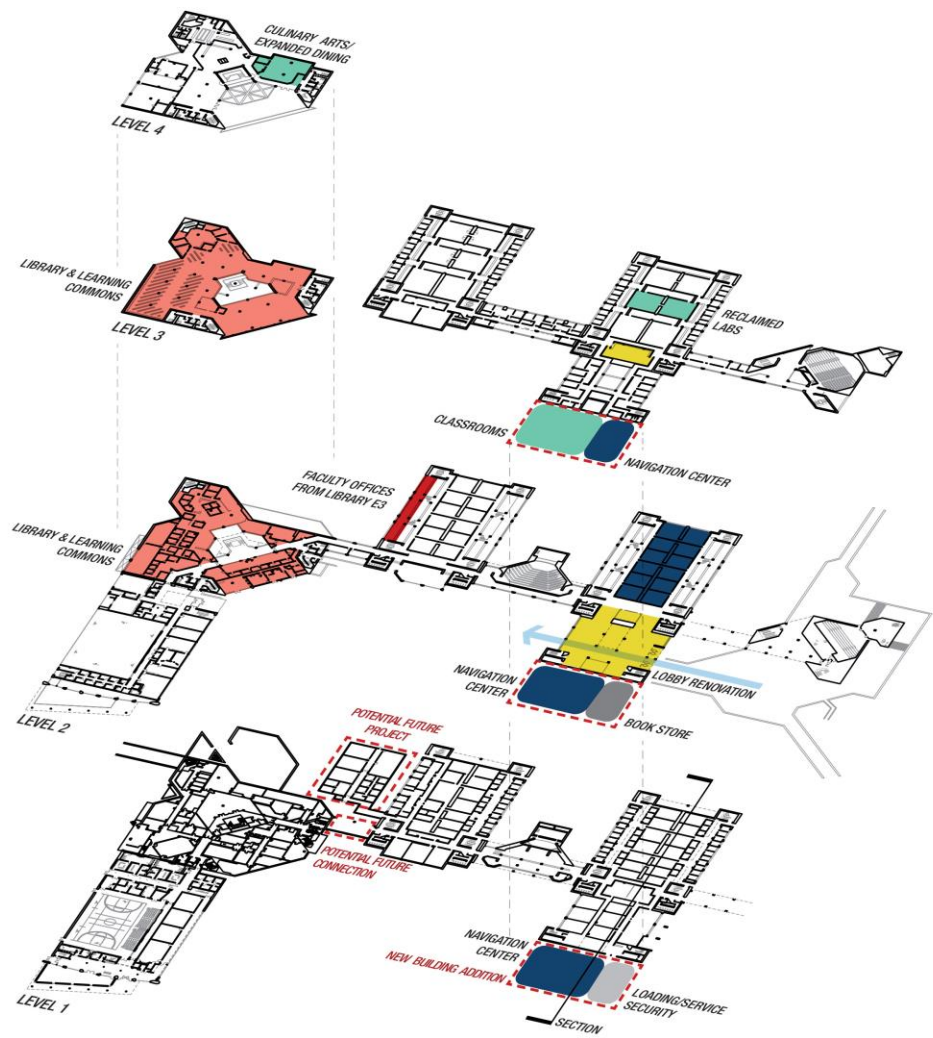
- NEED #1: NEW & RECLAIMED INSTRUCTIONAL SPACE
- NEED #2: LIBRARY + LEARNING COMMONS
- NEED #3: NAVIGATION CENTER + LIFEMAP
- NEED #4: STUDENT ACTIVITY SPACE
- RELOCATED FACULTY OFFICES
- BOOKSTORE
- LOADING/SECURITY



ADDITION
OPTION A

ADDITION
OPTION B

ADDITION
OPTION C



COMPOSITE MAPPING WITH PREFERRED PRIORITY PROJECT SCENARIO

- Between 66% and 80% of community college students drop out before graduation.
- Half of all community-college students arrive unprepared for college work.
- The ratio of guidance counselors to students is too low.
- A quarter of college students nationwide have dependent children, and even more students at community colleges do. But less than half of community colleges now have any day-care facilities.