HGA

RETURNING TO CAMPUS

CREATING HEALTHY ENVIRONMENTS FOR LEARNING

OVERVIEW

Academic institutions are planning for an eventual return to campus. **Maintaining effective learning, intellectual exchange, and social life** in the face of keeping their communities healthy is a significant challenge amidst uncertain and changing circumstances. **We aim to help**.

First, consider the evolving advice from official sources:*

CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC)

Current CDC guidelines for colleges and universities are general and qualified; implementation is recommended where "... possible, feasible, practical, and acceptable, and tailored to the needs of each community." Guidelines will also need to be supplemented by forthcoming guidance from state and local governments. CDC protocols include:

- Maintaining social distancing
- Taking steps to avoid crowding
- Encouraging frequent hand washing or hand sanitizing
- Cleaning surfaces thoroughly and frequently
- Limiting gatherings to 10 to 50 people, dependant upon local conditions

AMERICAN COLLEGE HEALTH ASSOCIATION (ACHA)

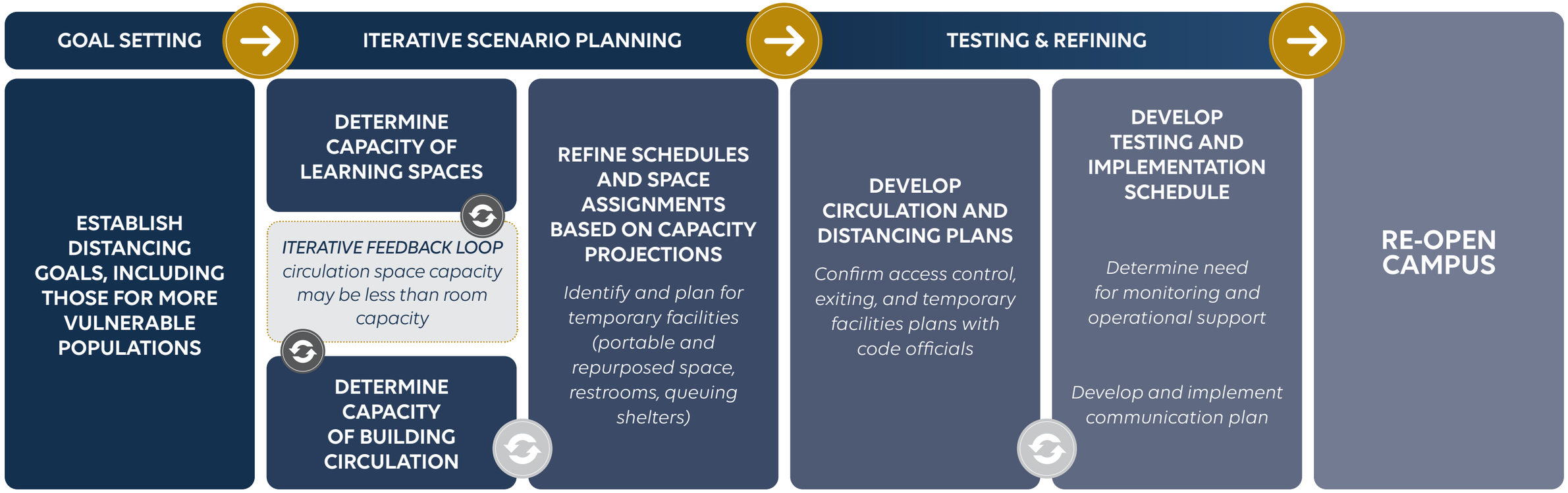
In May 2020, ACHA released ***Considerations for Reopening Institutions of Higher Education in the COVID-19 Era***. These new guidelines describe higher education campuses as "exemplar of a congregate setting with multiple risk factors for ready transmission of COVID-19" and summarize key considerations for campus planners.

As colleges and universities develop re-opening strategies and timelines for their own communities, the following design tools and considerations are intended to help ease the process.

Institutions should reference the CDC and their State Health Department for the latest recommendations regarding COVID-19 protocols.

OUTLOOK

Re-imagining campuses for social distancing will be a crucial first step in planning for operational change. Many adjustments made today will endure, and should be evaluated where possible as elements of a **long-term strategic evolution.**



HAVE YOU CONSIDERED...

That the tools and processes institutions utilize to respond to COVID-19 can also be utilized to respond to ongoing trends in higher education?

- Projected declines in enrollment
- Tuition inflation and student debt burdens
- Concerns about career relevance
- Investments to support online learning
- Debate on benefits of on-campus education
- Pressure to increase the efficiency of student support services and campus facilities

ADJUST SCHEDULING & PLANNING INPUTS

Update and refine **space programming tools** based on distancing needs.

Distancing guidelines will reduce the capacity of the most common learning space types by 17 to 55%. **Institutions will need to update space utilization projections based on reduced capacity and quickly test different loading and scheduling scenarios.**

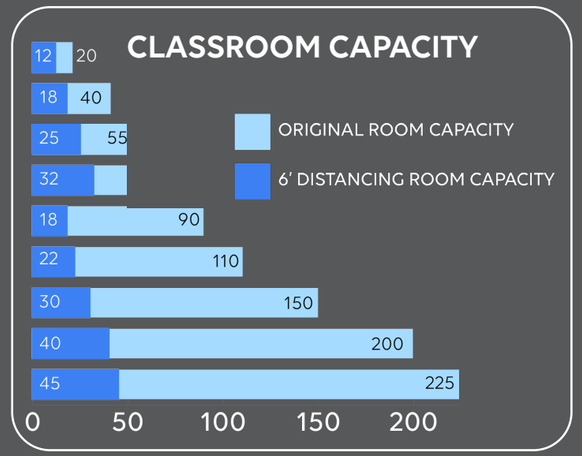
Simple refinements to established programming tools can calculate teaching space outcomes based on key variables such as:

- Reduced classroom capacity resulting from distancing
- Increased utilization
- Adding non-classroom spaces into the inventory

HAVE YOU CONSIDERED...

- How office hours will be addressed if faculty will be teaching more hours?
- If classes will be solely online, what digital tools will be available to allow students and faculty to interact?
- What hours can be expected of faculty? Are there other learning staff available to assist with demand?

CLASSROOM DEMAND ANALYSIS TOOL



40

INPUT TARGET CLASS HOURS PER WEEK

REDUCED CAPACITY INPUTS
Represents test fit averages

MODIFIED OUTPUTS
Based on reduced capacity

INVENTORY
Addition of non-classrooms to teaching inventory

ORIGINAL ROOM CAPACITY	6' DISTANCING ROOM CAPACITY	TOTAL SECTIONS	TOTAL ROOM PERIODS	6' DISTANCING ROOM PERIODS	TOTAL REQUIRED ROOMS	NO. OF AVAILABLE ROOMS	BALANCE	PLANNED ADJUST	ADJUSTED BALANCE
20	12	88	257	154	4	6	2	1	3
40	18	370	1,065	479	12	9	(3)	2	(1)
55	25	254	792	356	9	9	0		0
70	32	35	127	57	2	4	2		2
90	18	6	19	4	1	1	0		0
110	22	9	31	6	1	0	(1)		(1)
150	30	0	0	0	0	1	1		1
200	40	1	1	1	1	0	(1)		(1)
225	45	0	0	0	0	1	1		1
		763	**2,292**	**1,058**	**30**	**31**	**1**	**3**	**4**

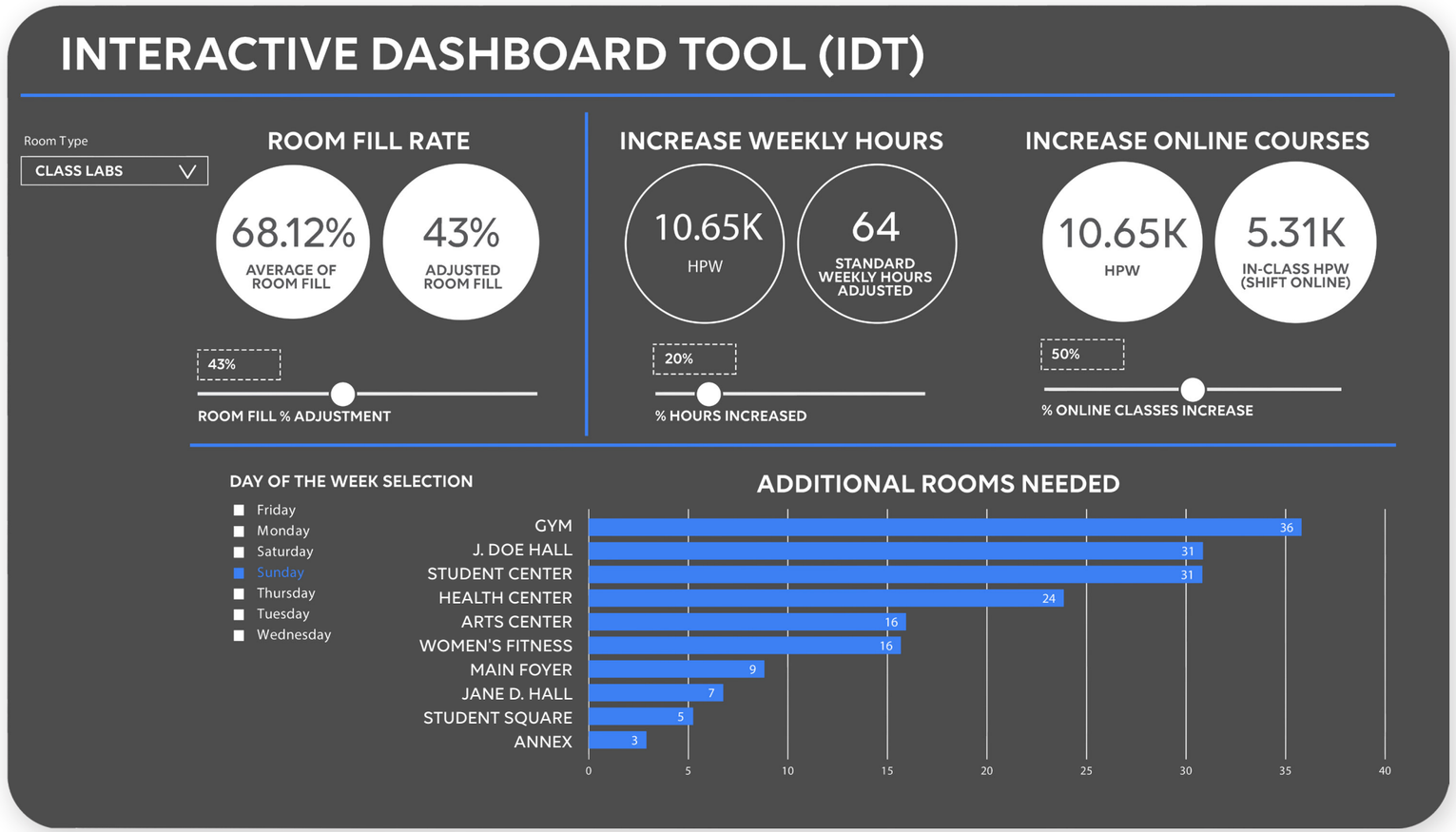
Sample campus classroom demand analysis updated to account for new classroom capacities.

REFINE UTILIZATION DATA

Scenario planning will be needed to respond to evolving guidelines, unpredictable student health outcomes, and emerging space utilization discoveries.

Planners will need to manage changing data inputs resulting from altered classroom and building capacity, greater use of online resources, and scheduling variants.

HGA has developed an **Interactive Dashboard Tool (IDT)** that incorporates data analysis to provide institutions with greater depth of planning insight and support. **The IDT allows institutions to rapidly test utilization variants and project the possible consequences.**



HAVE YOU CONSIDERED...

Utilizing changes to teaching space inventory to:

- Introduce new teaching pedagogies?
- Respond to trends in higher education that were developing before COVID-19?

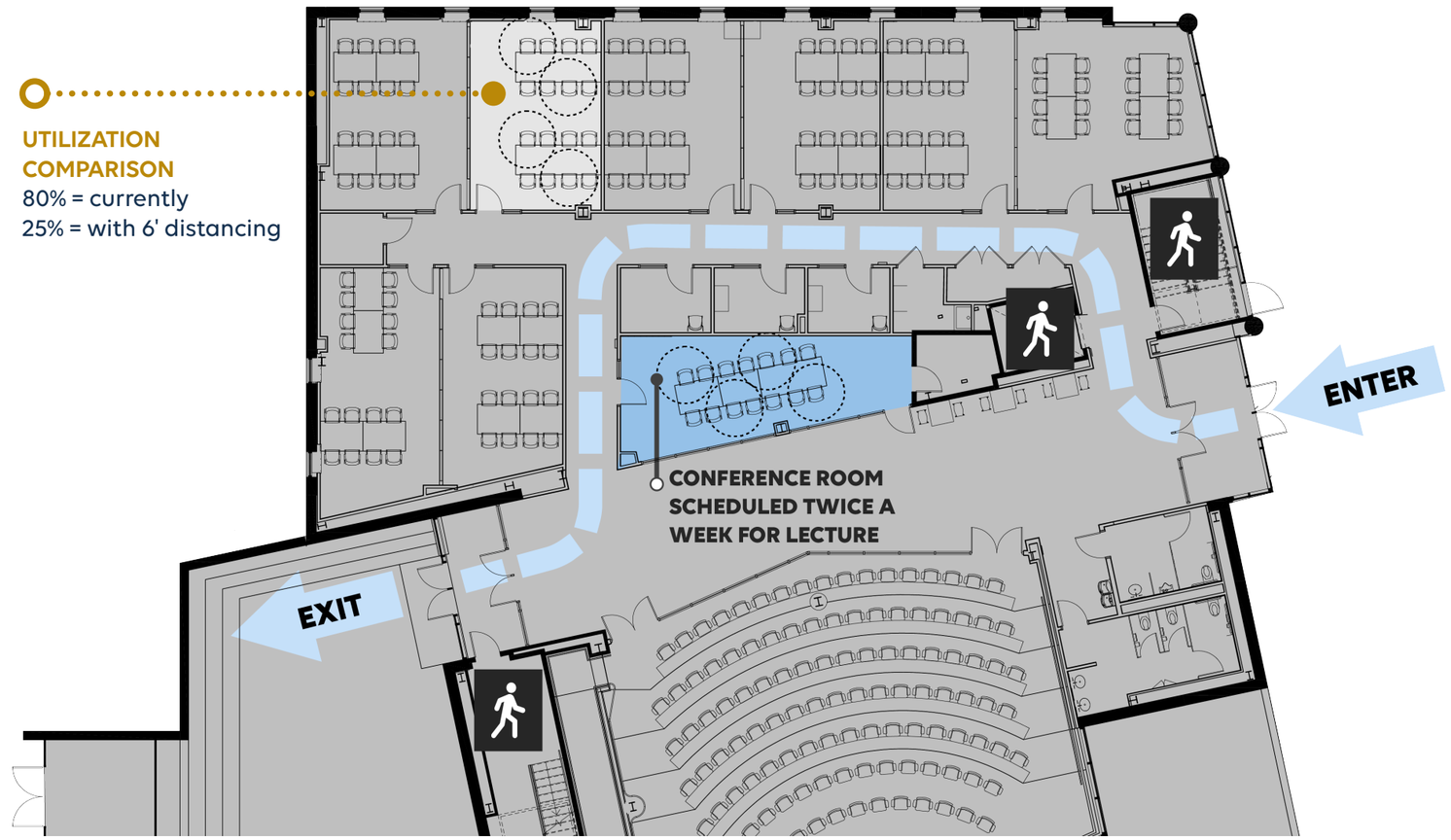
Our IDT allows institutions to rapidly evaluate outcomes resulting from different scenarios.

- Change % room fill
- Add evening/weekend courses
- Increase % online courses
- Quantify unavailable seats
- Split classes into two sections (teach one-half of the population in-person at a time)
- Stagger start and stop times for classes
- Add alternate teaching locations

ASSESS ALTERNATE LOCATIONS

Many colleges and universities currently teach a small but significant number of classes in spaces that are not categorized as classrooms or class labs. **Consider repurposing ancillary spaces for instructional use.**

Comparing recent course schedules with the campus space inventory will identify non-classroom spaces that are used for instruction. Once identified, they can easily be input into our Interactive Dashboard Tool to measure impact on capacity.



HAVE YOU CONSIDERED...

- What's the least amount of technology required to hold classes in alternative locations?
- What furnishings would students need during class in alternate locations?
- If changes necessitated by social distancing requirements are an opportunity to permanently recalibrate room types?

Our IDT allows institutions to rapidly evaluate capacity changes resulting from adding alternate locations.

- Convert research space into teaching labs
- Use conference rooms
- Convert food service areas
- Incorporate outdoor spaces
- Engage with community partners: theaters, convention centers, and galleries/museums

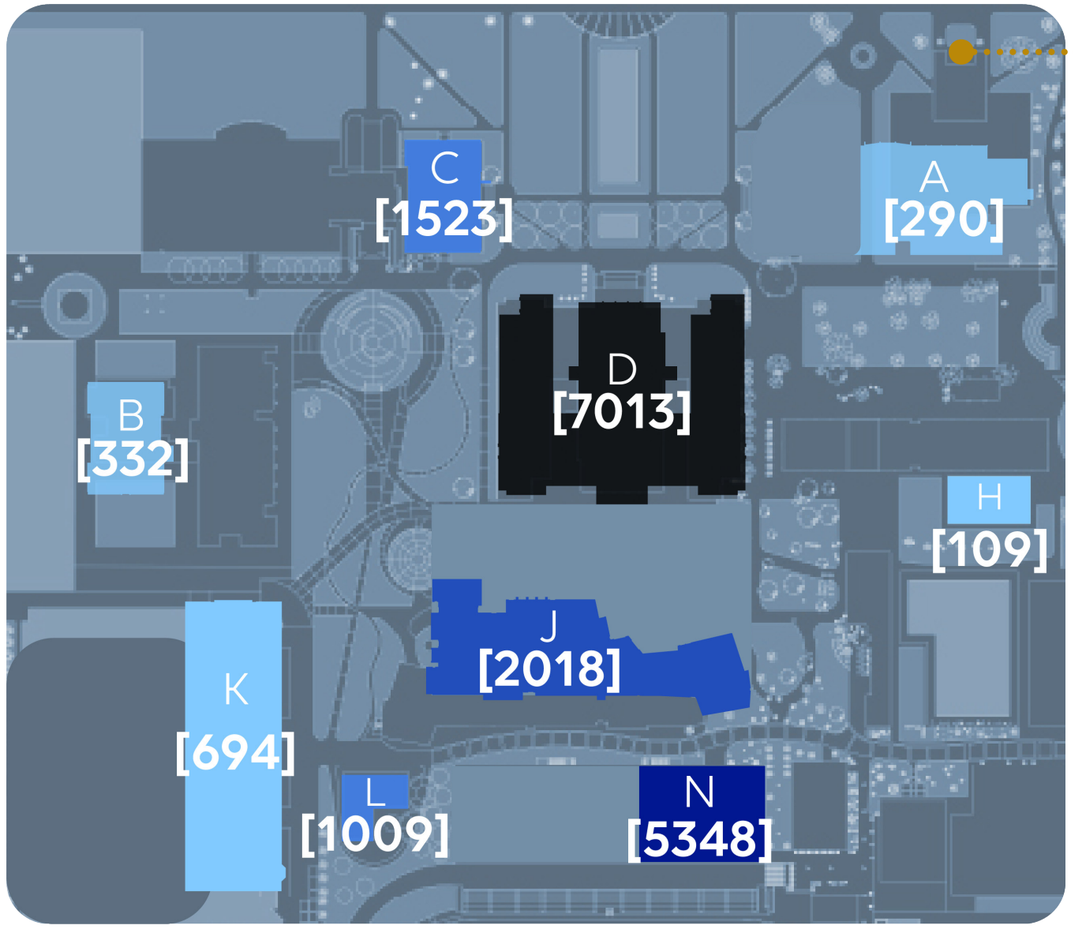
ASSESS MOVEMENT ACROSS CAMPUS

Solving **social distancing at the campus scale** will be a significant challenge. Institutions will need to **manage pedestrian traffic flows** to prevent unanticipated crowding.

By tying data analysis to mapping and visualization tools, a campus can connect scheduling to campus-wide movement.

HGA's Interactive Dashboard Tool translates teaching space scenarios into a holistic view of campus. Linked to the campus map, IDT illustrates the areas of greatest concentration of students at anyone time, or an average of time, based on changeable inputs.

Layering in anticipated visitor counts such as cafeteria visits and administrative staffing numbers provides an in-depth look at density, enabling campus planners to manage flow and limit congestion.



MAPPING STUDENT DENSITIES
This example campus diagram is linked to our IDT with manipulatable data to illustrate the number of students occupying teaching spaces in each building. It illustrates a specific day/time or a weekly/ semester average.

CAPACITY LEGEND
[WEEKLY VISITS]

- 7000+
- 5000-6999
- 2000-4999
- 1000-1999
- 100-999

SOLVE HIGH-STAKES CONDITIONS

Social distancing in high traffic settings will be difficult to predict and manage through trial and error. Certain high-stakes settings may require detailed analysis for safer re-opening.

Advanced modeling techniques support detailed circulation planning in challenging, high-volume spaces. Those that support precise analysis of social distancing include:

- **Predictive 'heat mapping'** depicts occupant loads derived from class scheduling data.
- **Discrete Event Simulators** examine operations as sequences of events in time.
- **Agent-Based Simulators** model the behavior of people as they move and interact.
- **Continuous Simulators** predict flow streams based on specified inputs.

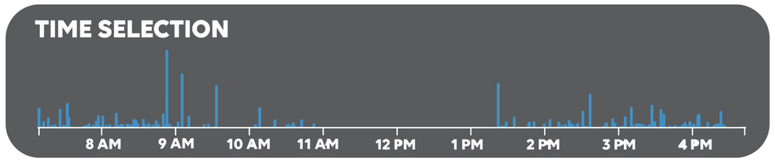
HEAT MAPPING CAMPUS ACTIVITY
This example heat map illustrates high-traffic and high-density campus spaces based on online survey responses from the campus community.

MAP BUILDING USE

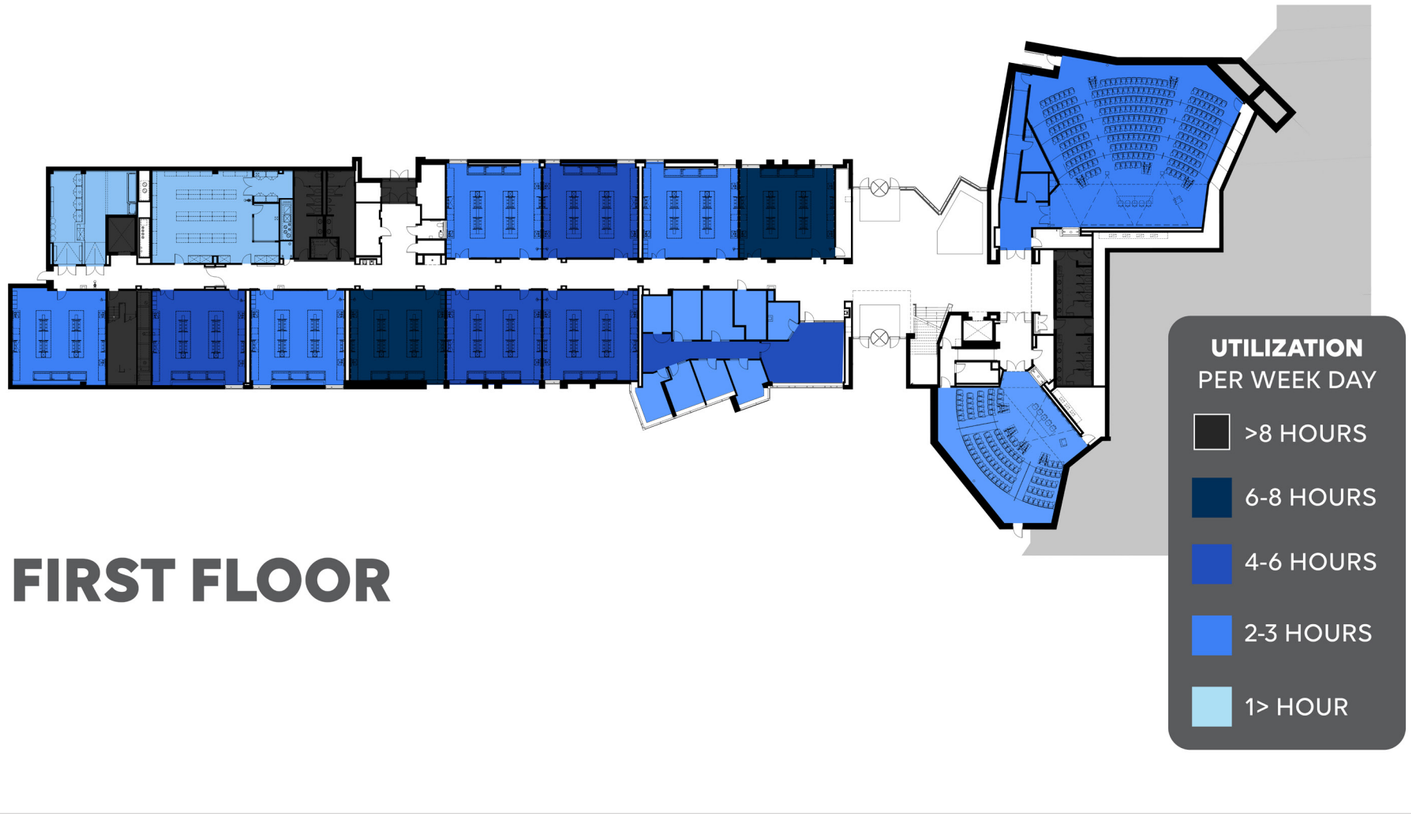
The Interactive Dashboard Tool can be used along with dynamic diagraming tools to map out use within buildings based on planning scenarios. These diagrams can inform the development of building-specific plans **showing paths of travel** and visually identify **teaching spaces with additional capacity.**

HAVE YOU CONSIDERED...

- What other data would be useful to translate into graphic format?
- How understanding specific room use relates to the campus network of available space?
- How to apply COVID-19 scenario planning tools in future years to better utilize campus resources?



TEACHING SPACE UTILIZATION
Floor plans illustrating a weekly average of teaching space utilization can also be used to look at specific times.

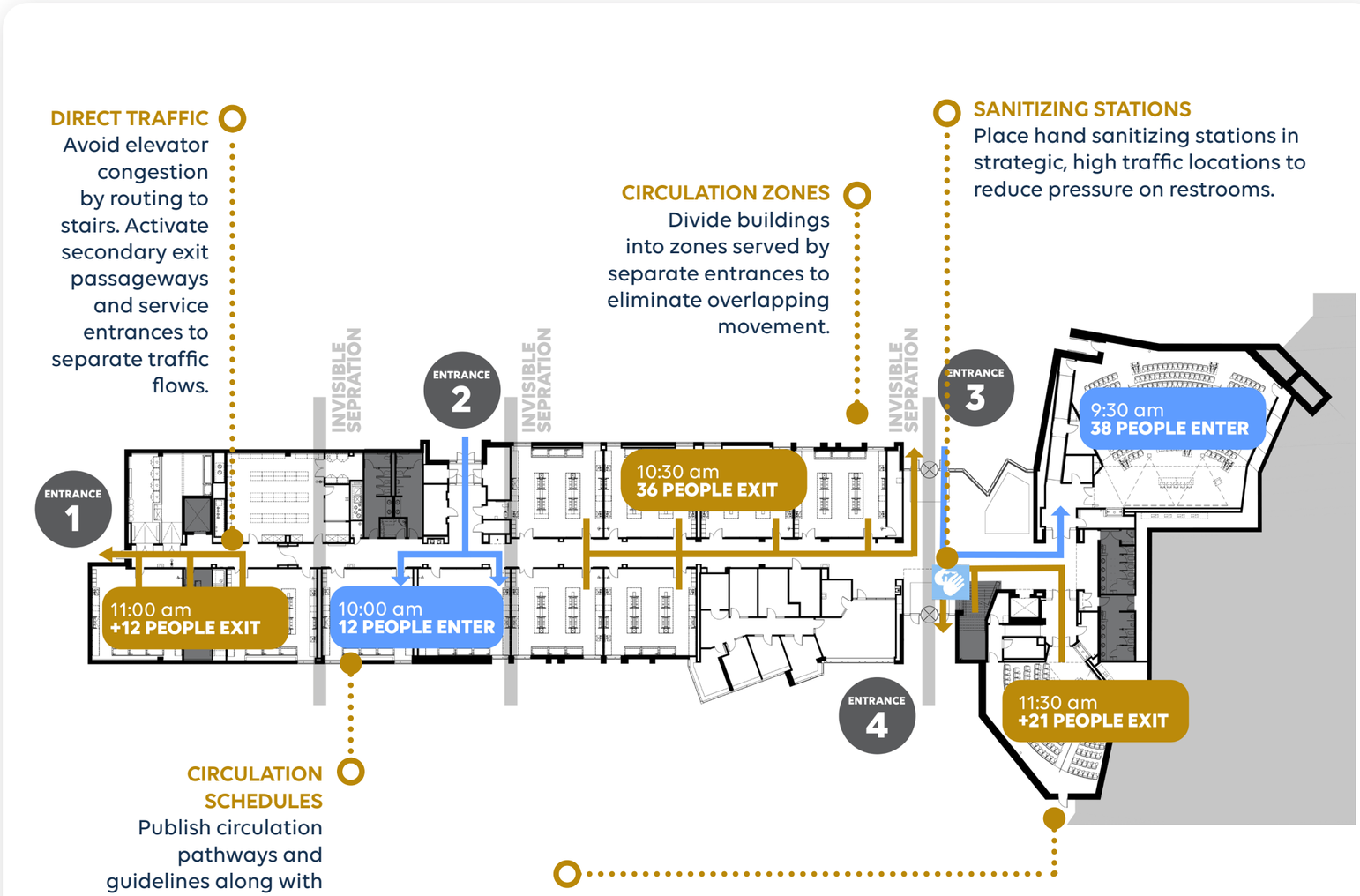


FIRST FLOOR

DESIGN SAFE FLOW

Establishing flow patterns through constrained entries, elevators, corridors, and public spaces will be key in **balancing distancing guidelines** with efficient movements, class scheduling, and prevention of avoidable congestion.

Typical dimensions of circulation elements will restrict many movements and spaces to one student at a time. The adjacent sample floor plan demonstrates some possible interventions and considerations.



CIRCULATION

HIGH FOOT TRAFFIC AREAS

EVALUATE BUILDING CAPACITY

Entrances, corridors, and stairs will accommodate a **fraction of their intended capacity** under social distancing.

Following an ideal distancing scenario, **a building needs 28 square feet of queuing and 28 square feet of movement space per circulating student** at any interval between classes. Circulation space in a highly efficient classroom building typically provides **under five square feet of corridor space per student.**

The reduced capacity of corridors, stairs, elevators, vestibules, and restrooms will likely restrict overall occupant capacity for many buildings, **especially taller structures served by elevators.** The adjacent sample floor plan demonstrates possible interventions and considerations.

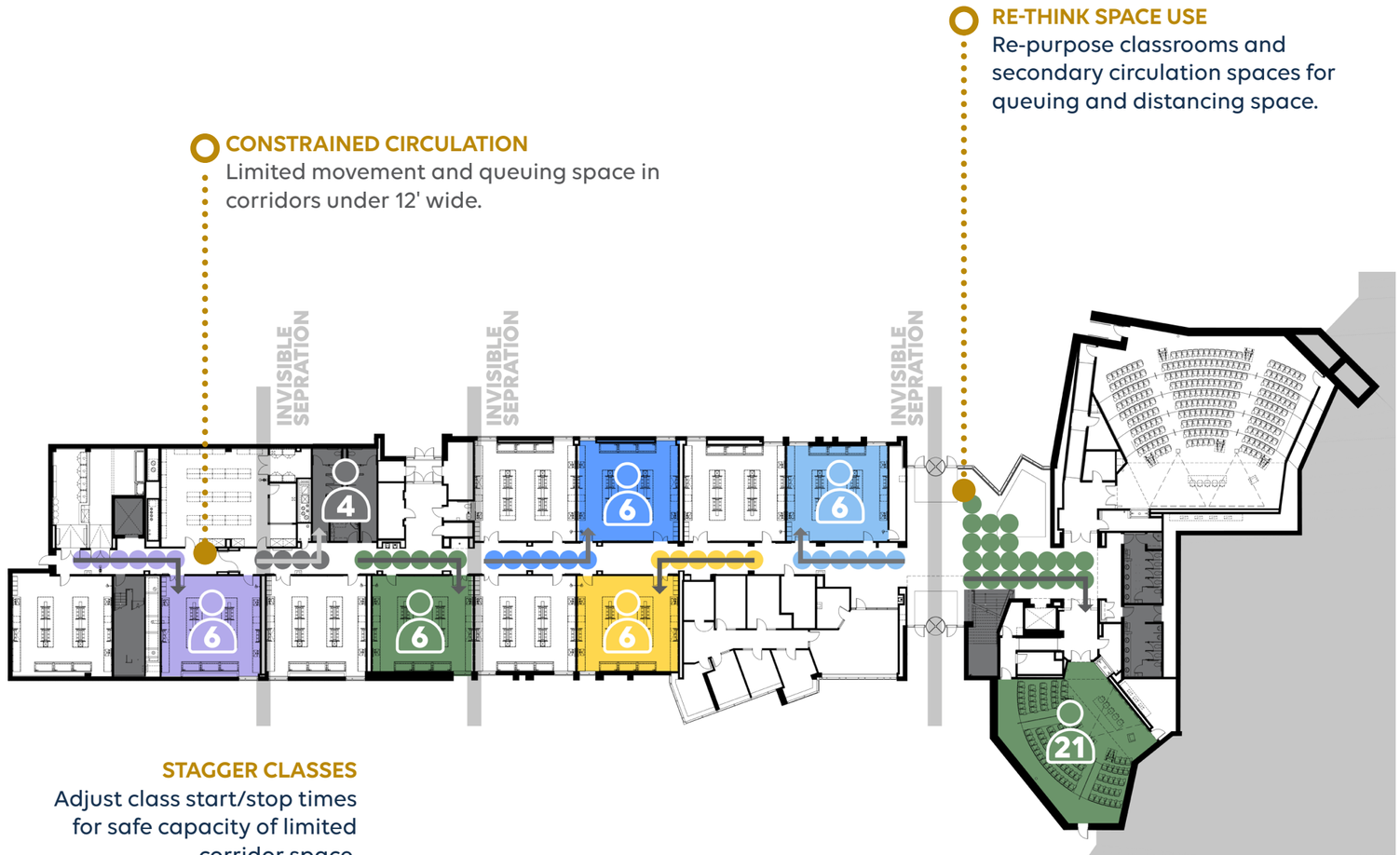
Institutions will need to make complex judgment calls based on a patchwork of guidelines, including the *U.S. Fire Administration's* *Understanding the Impact of Social Distancing on Occupancy.*

NEW ROOM CAPACITY

QUEUE SPOT PER PERSON

CONSTRAINED CIRCULATION
Limited movement and queuing space in corridors under 12' wide.

RE-THINK SPACE USE
Re-purpose classrooms and secondary circulation spaces for queuing and distancing space.



STAGGER CLASSES
Adjust class start/stop times for safe capacity of limited corridor space.

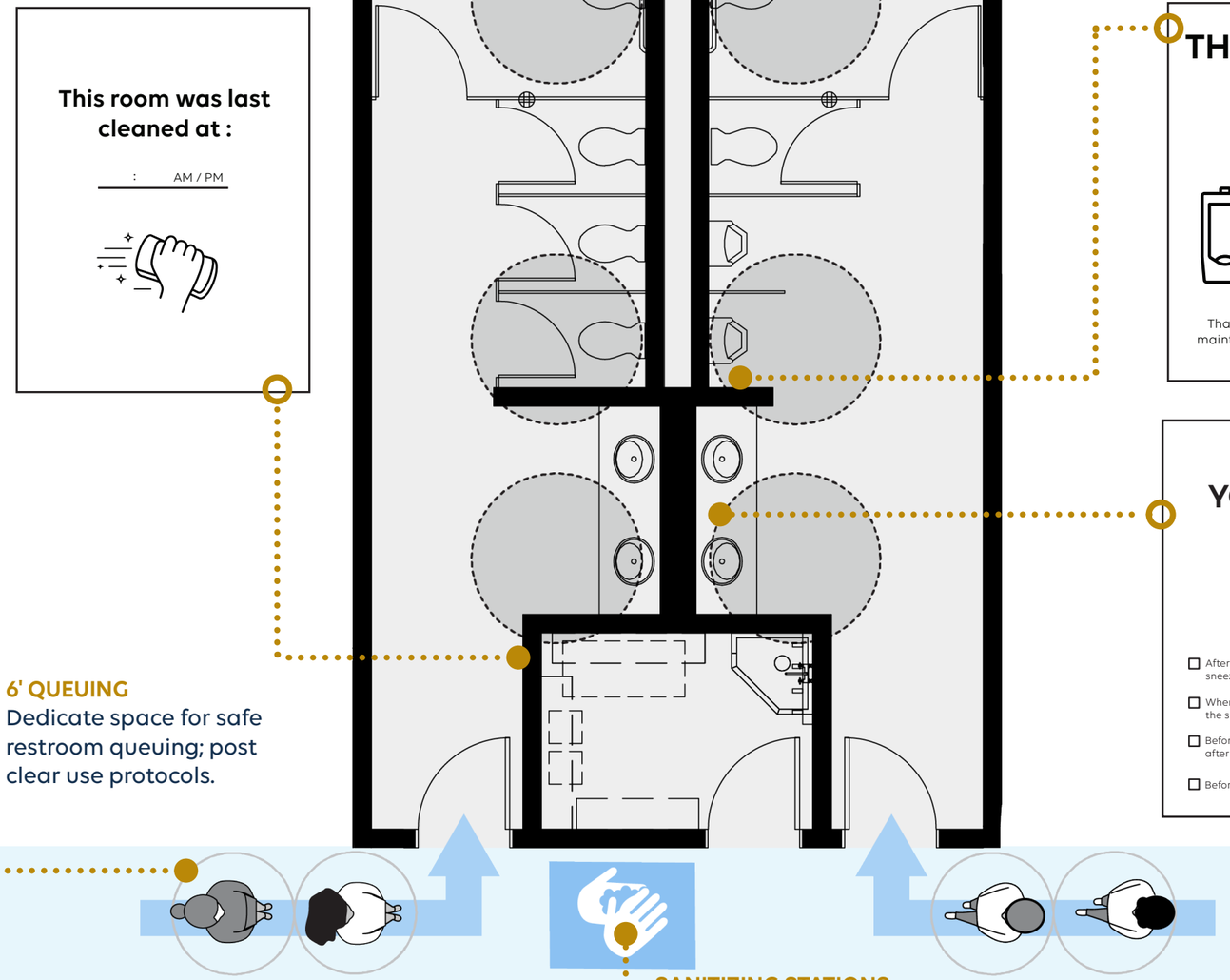
ADDRESS RESTROOM CAPACITY

Managing access to restrooms will be a particular challenge, requiring clear organization and communication.

Ideal distancing requires at least 6 feet per person. The current standard for typical code-compliant restrooms is at most 5 feet per person. **Following strict distancing protocols, many restrooms, regardless of capacity, will only be usable for one person at a time.**

In addition to solving for these challenges, institutions will need to post clear communications.

CLICK HERE TO DOWNLOAD HGA'S PRINTABLE SIGNAGE PACKAGE.



FIXTURES
Reduce fixture counts in temporary facilities.

THIS URINAL IS CLOSED

6 FT.

Thanks for not using this fixture to maintain 6 ft. of distance from others.

WASH YOUR HANDS

- ☐ After coughing or sneezing
- ☐ After toilet use
- ☐ When caring for the sick
- ☐ When hands are visibly dirty
- ☐ Before, during and after preparing food
- ☐ After handling animals or animal waste
- ☐ Before eating
- ☐ Before and after reading this sign

6' QUEUING
Dedicate space for safe restroom queuing; post clear use protocols.

SANITIZING STATIONS
Place readily accessible hand sanitizing stations outside restrooms.

COMMUNICATE CULTURE CHANGE

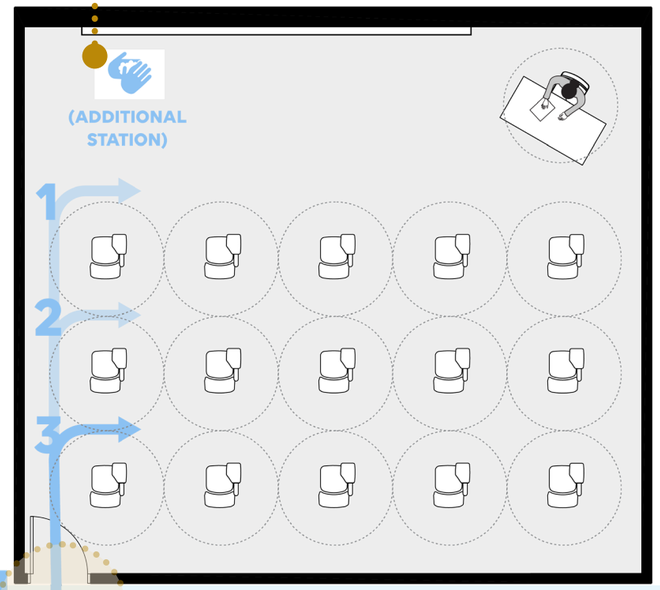
It will not be possible to plan and design for every circumstance. Therefore, it will be important to inspire voluntary responsible behavior on the part of building users.

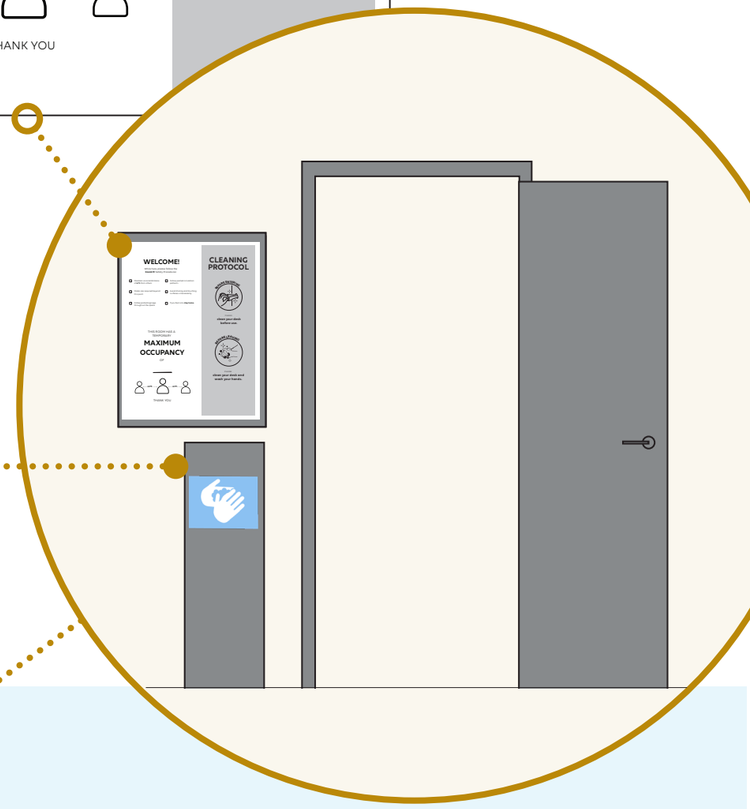
Proper social distancing, entrance/exit protocols, and clear communications might be the easy part. Institutions will also face decisions about how to maintain these protocols. Will faculty and staff have to advise students about safe conduct? Will additional monitoring and management be required as 'distancing fatigue' sets in?

CLICK HERE TO DOWNLOAD HGA'S PRINTABLE SIGNAGE PACKAGE.

SIGNAGE
A system of bold and legible signage will help users move safely and internalize new behaviors.

SANITIZING STATIONS
Students sanitize hands and take a sanitizing wipe to clean desks.





6' QUEUING
Students keep social distance while queuing for entry

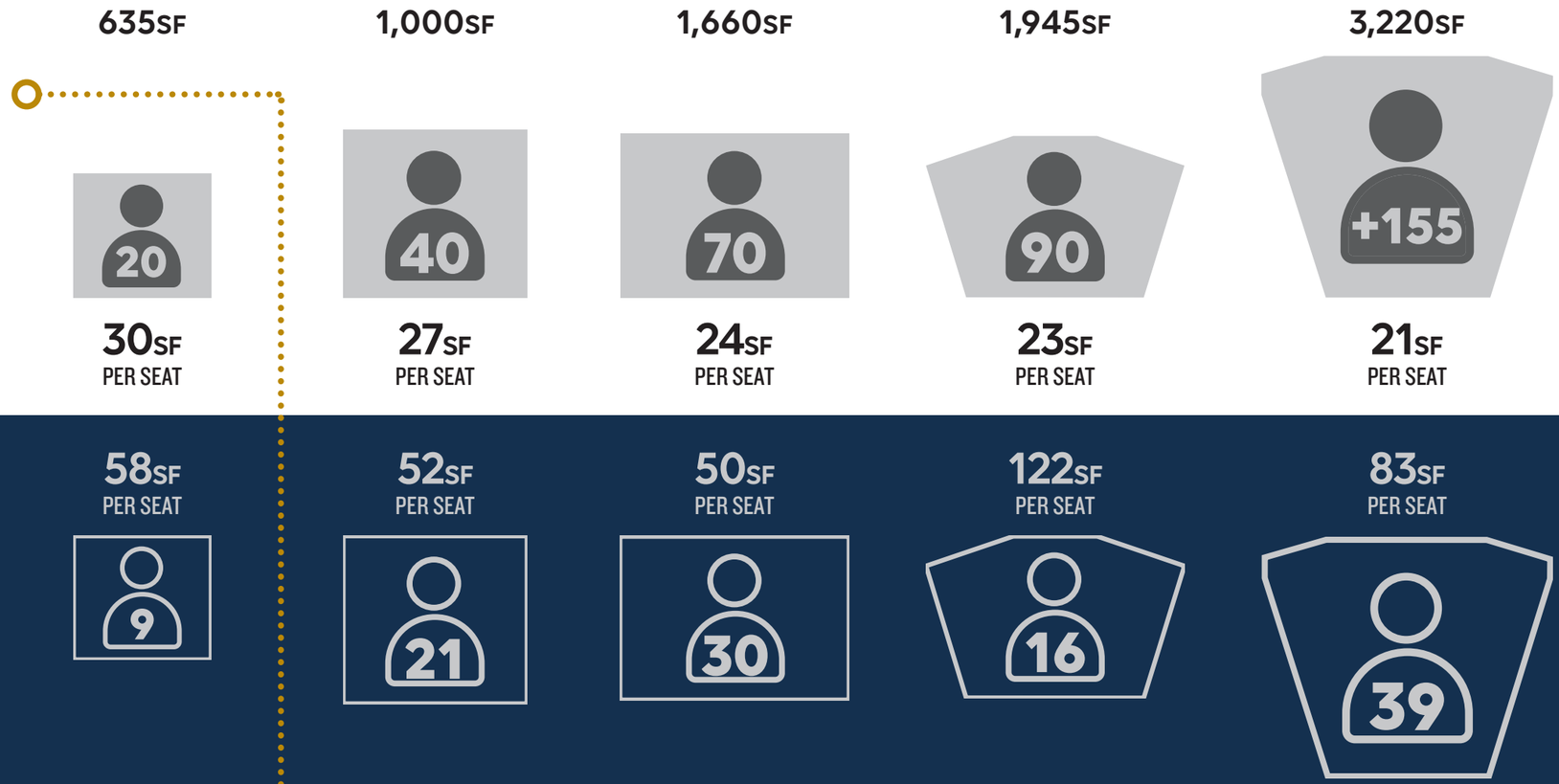
CORRIDOR

IN & OUT

DE-DENSIFY CLASSROOMS

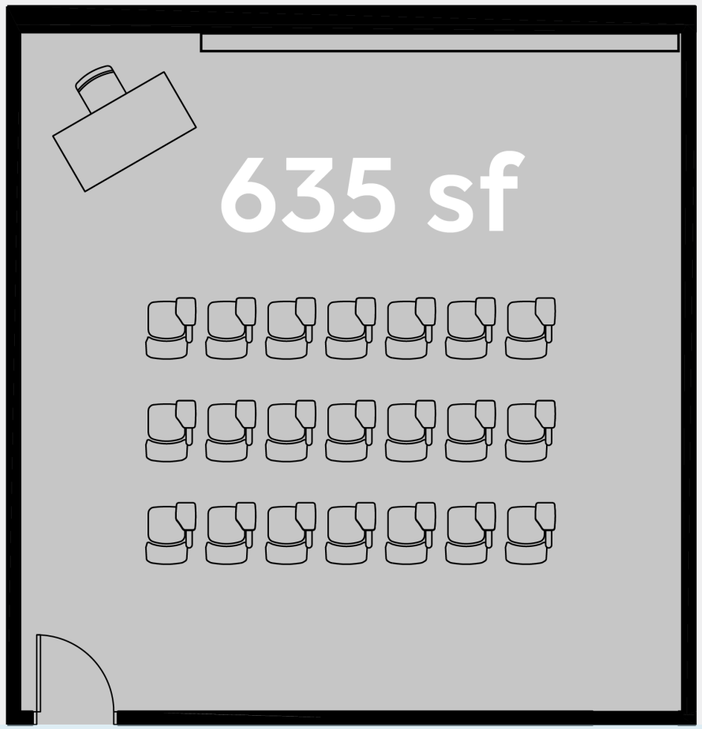
Different classroom types support different occupant loads under distancing protocols. **Smaller learning spaces accommodate a larger percentage of their original capacity than larger spaces,** which are designed to be densely packed. The following pages describe layouts, possible movement patterns, and suggested management strategies for some of the most common learning space types.

SMALL CLASSROOMS also appear to lend themselves to safer flow – with fewer students and less density to start with, it is easier to develop safe protocols for entering and exiting. Rooms with a single exit door will require careful attention to entry and exit protocols.



LARGE LECTURE HALLS will be a significant challenge given the low occupant yields resulting from distancing, the logistical difficulties related to tight access to mid-row seats, and the experiential challenges of teaching and learning in big, nearly empty rooms.

20-STUDENT CLASSROOM
TABLET ARM CHAIRS



52%
OF ORIGINAL
CAPACITY

CORRIDOR

IN/OUT

21
30SF
PER SEAT

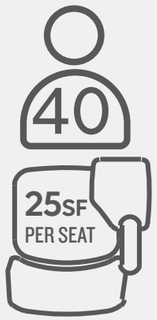
11
58SF
PER SEAT

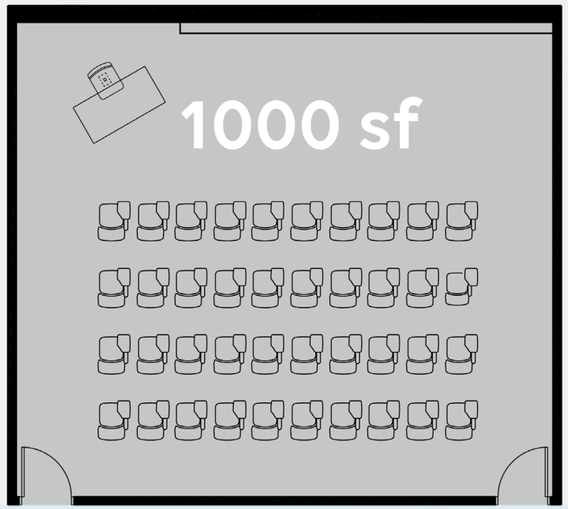
60SF
STORAGE

396SF
QUEUING

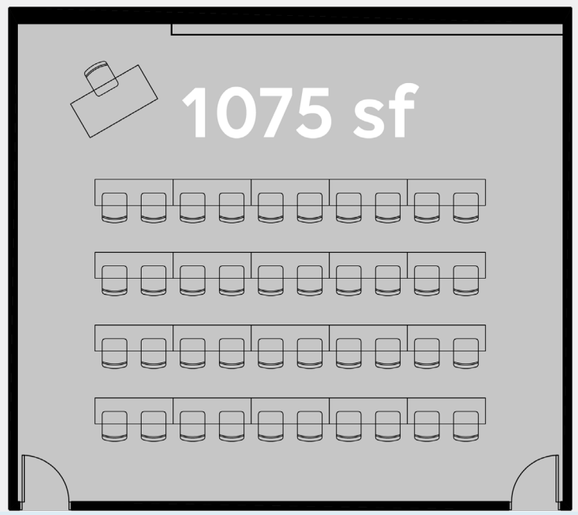
40-STUDENT CLASSROOM

TABLET ARM CHAIRS | CHAIRS & TABLES





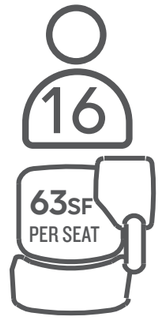
CORRIDOR



CORRIDOR

40%

OF ORIGINAL CAPACITY



576SF

QUEUING

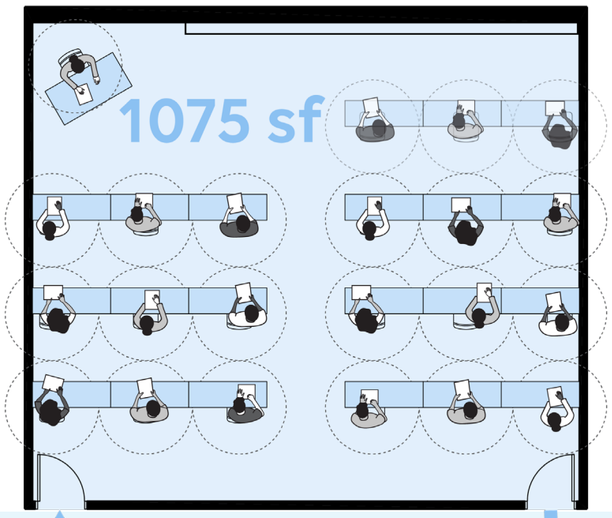
135SF STORAGE

53%

OF ORIGINAL CAPACITY

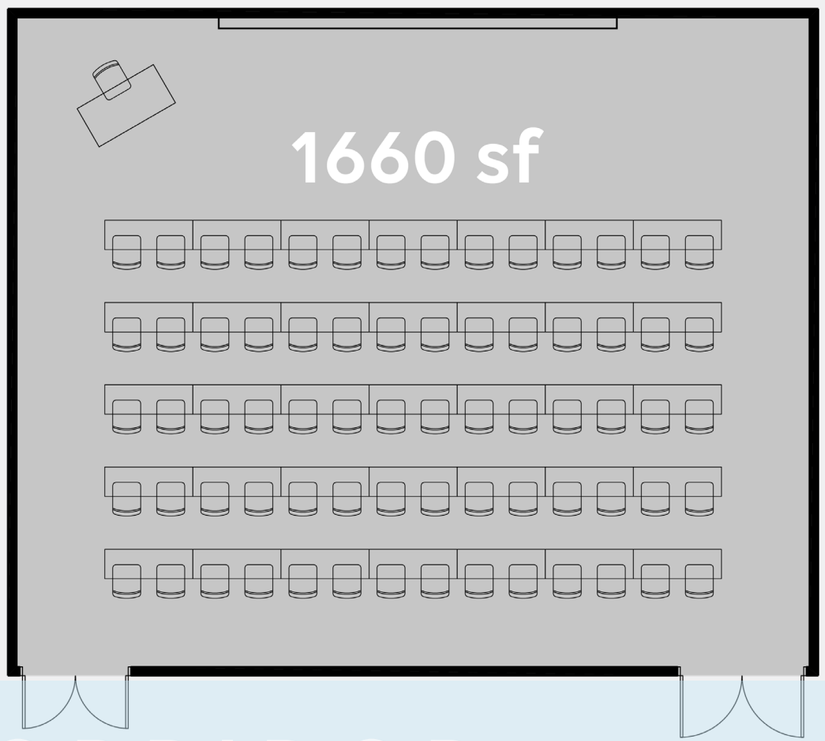
756SF

QUEUING



150SF STORAGE

70-STUDENT CLASSROOM
CHAIRS & TABLES



70

24SF PER SEAT

47%
OF ORIGINAL CAPACITY

33

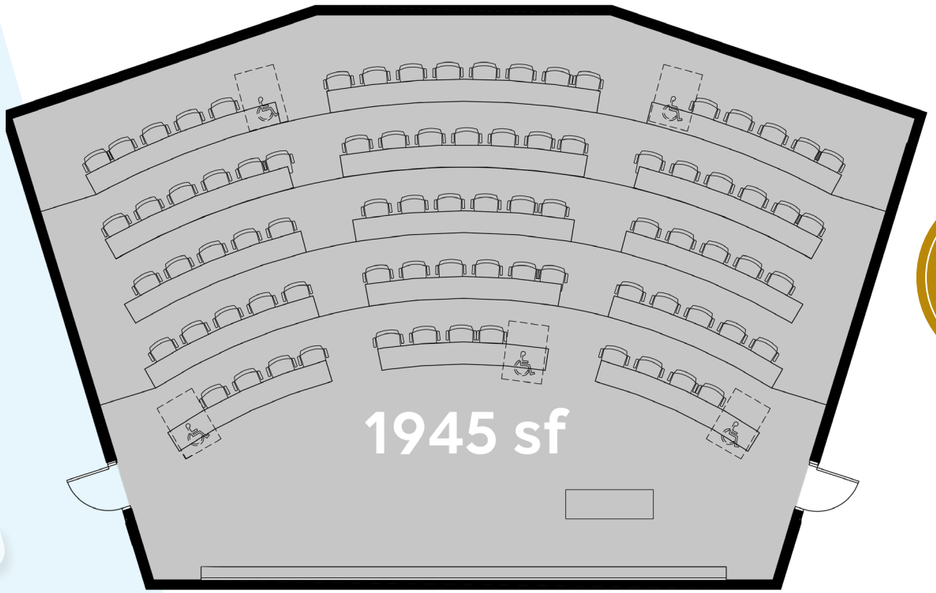
50SF PER SEAT

278SF
STORAGE

1,080SF
QUEUING

90-STUDENT CLASSROOM

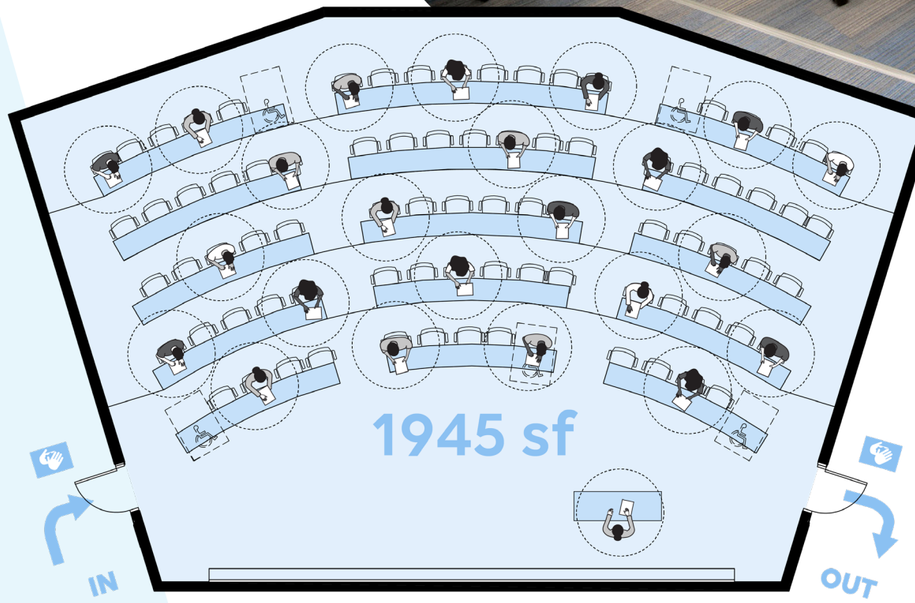
TIERED CHAIRS & TABLES



86

23SF
PER SEAT

19%
OF ORIGINAL
CAPACITY



16

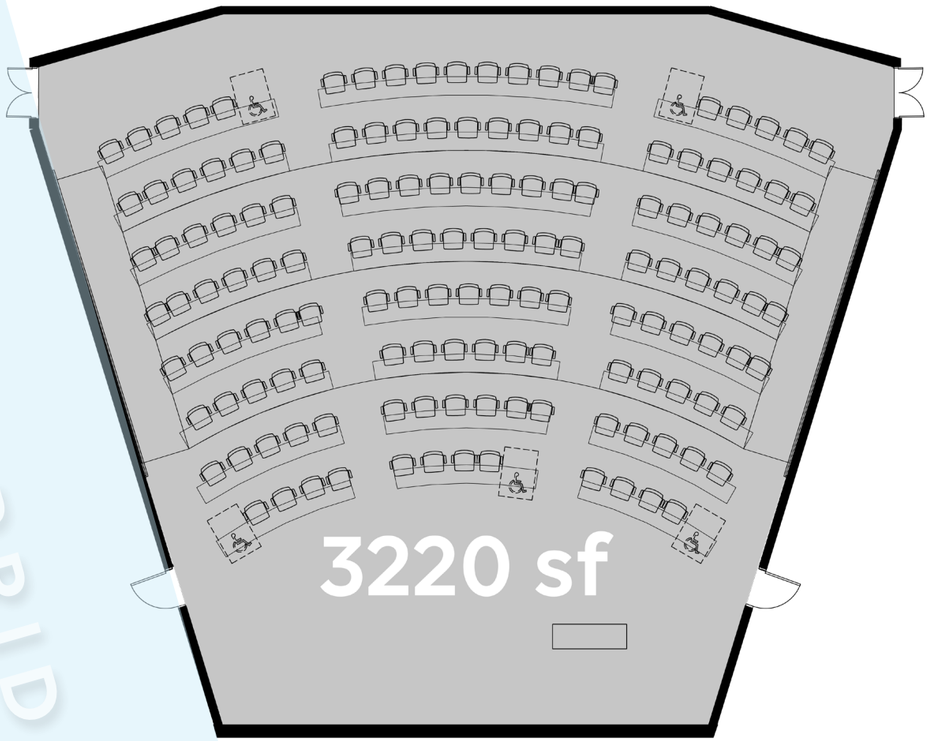
122SF
PER SEAT

576SF
QUEUING

CORRIDOR

+150-STUDENT AUDITORIUM

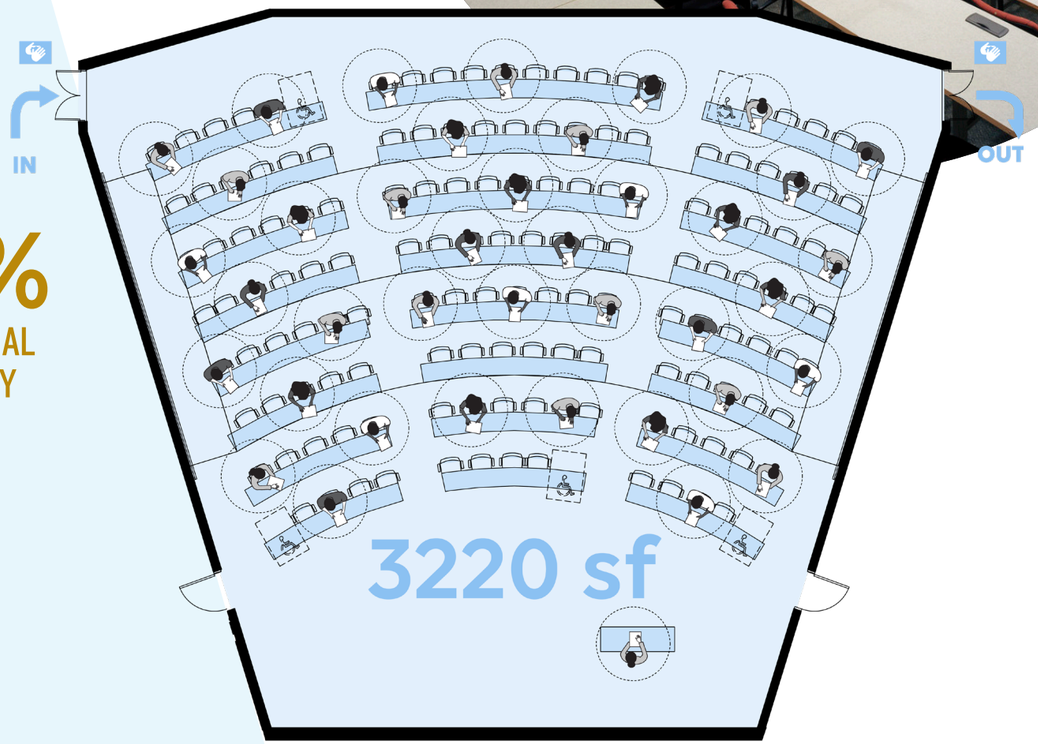
TIERED CHAIRS & TABLES



155

21SF PER SEAT

25%
OF ORIGINAL CAPACITY



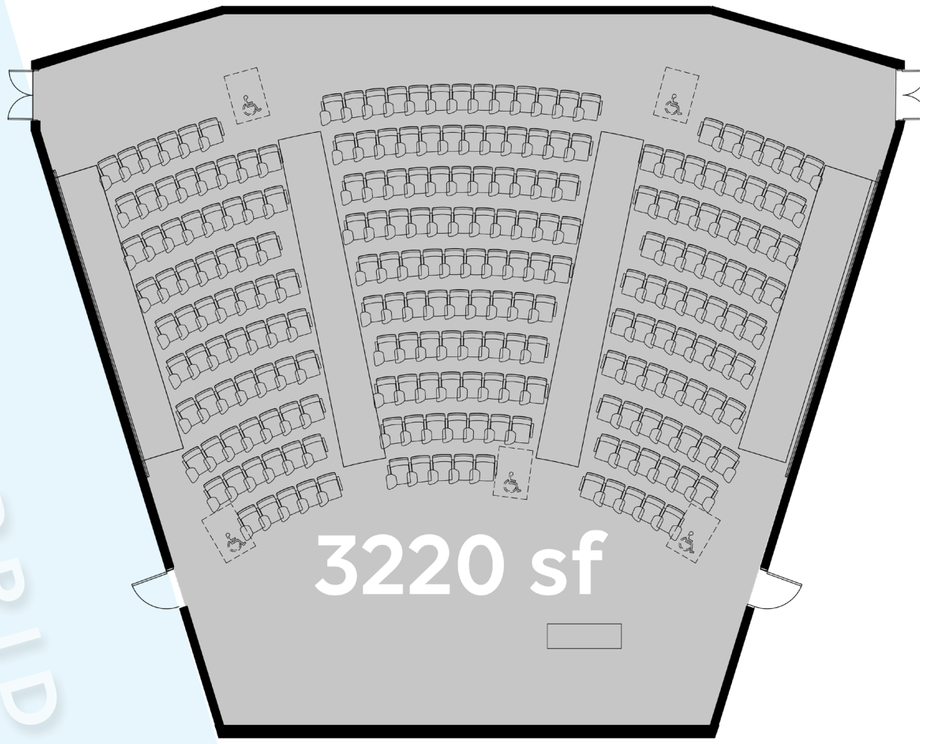
39

83SF PER SEAT

1,404SF
QUEUING

+150-STUDENT AUDITORIUM

SLOPED SINGLE SEATS

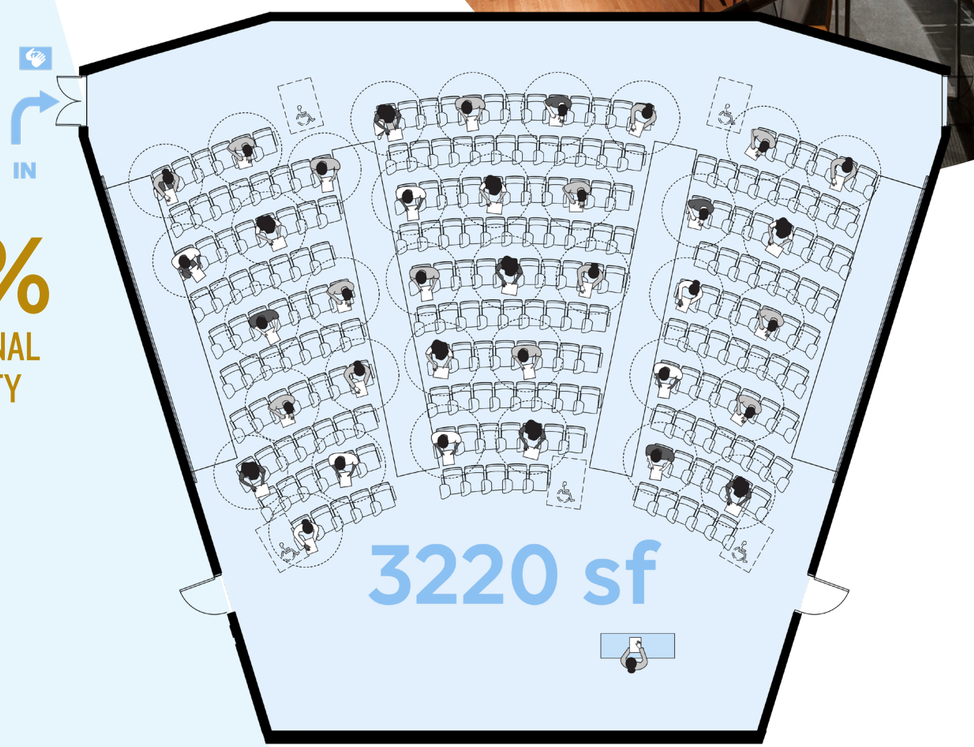


235

14SF PER SEAT

CORRIDOR

15% OF ORIGINAL CAPACITY



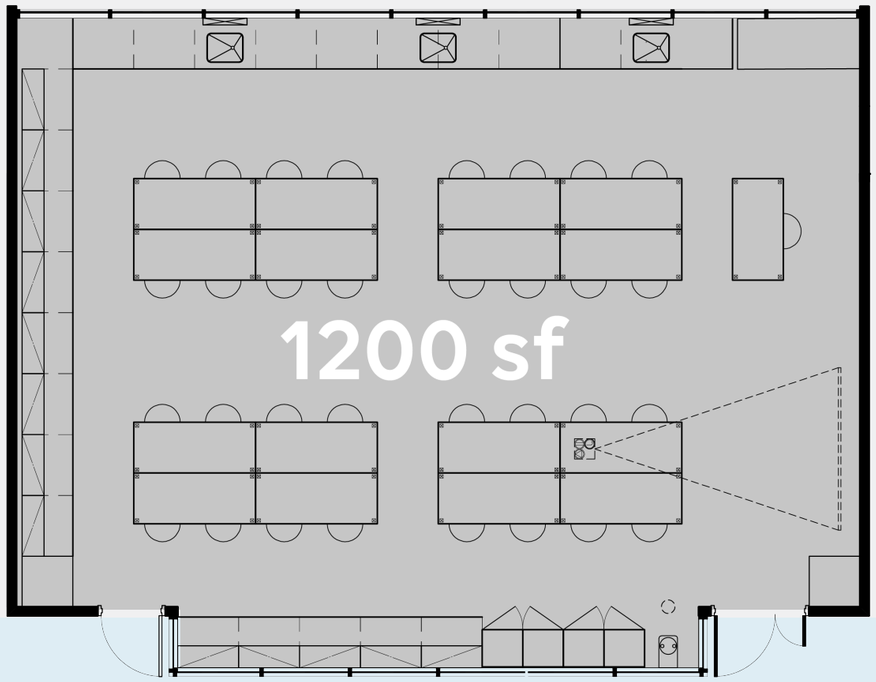
36

89SF PER SEAT

1,296SF

QUEUING

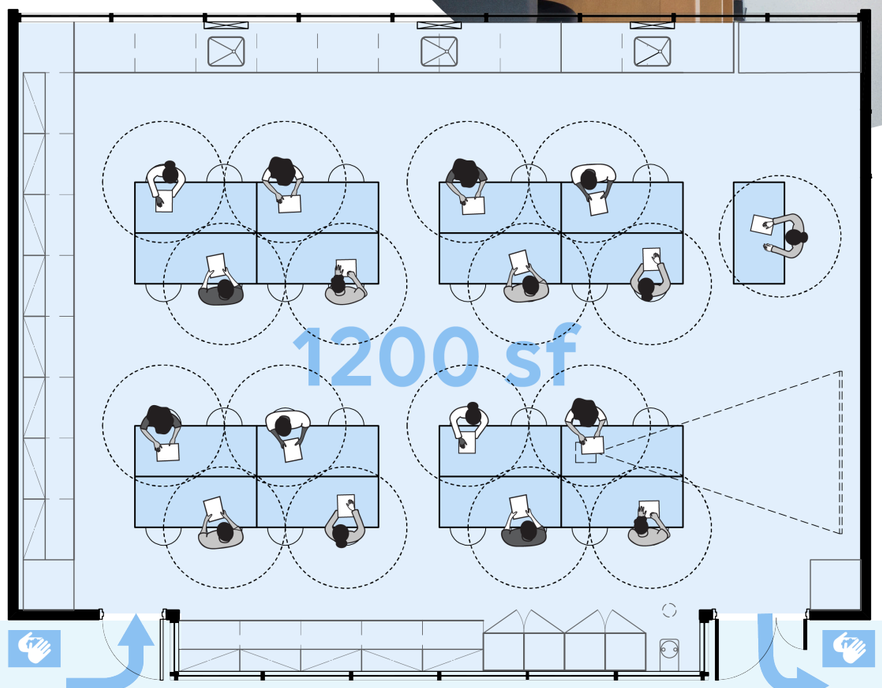
GENERAL BIOLOGY LAB



64

19SF
PER SEAT

25%
OF ORIGINAL
CAPACITY

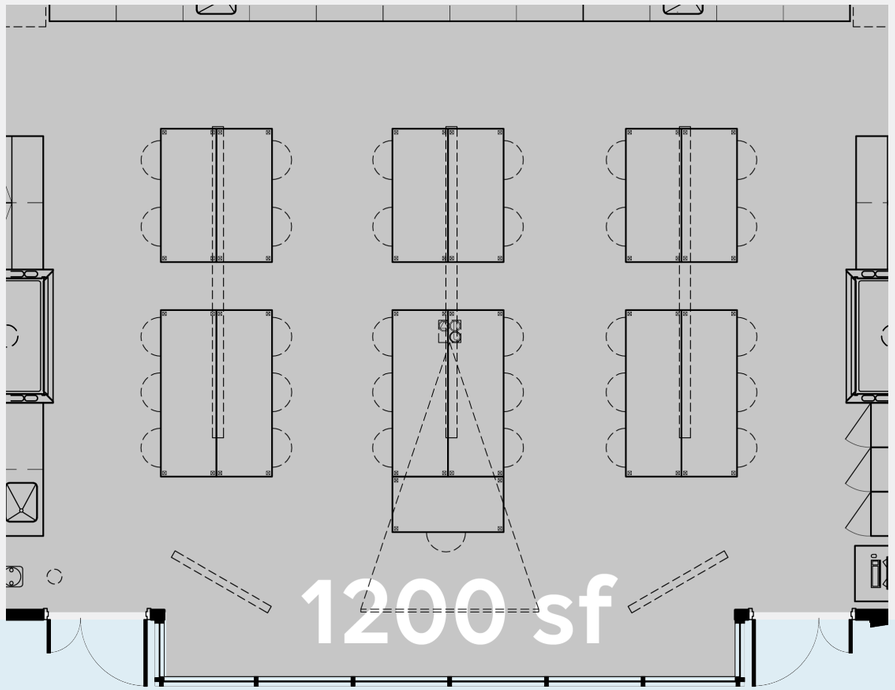


16

75SF
PER SEAT

576SF
QUEUING

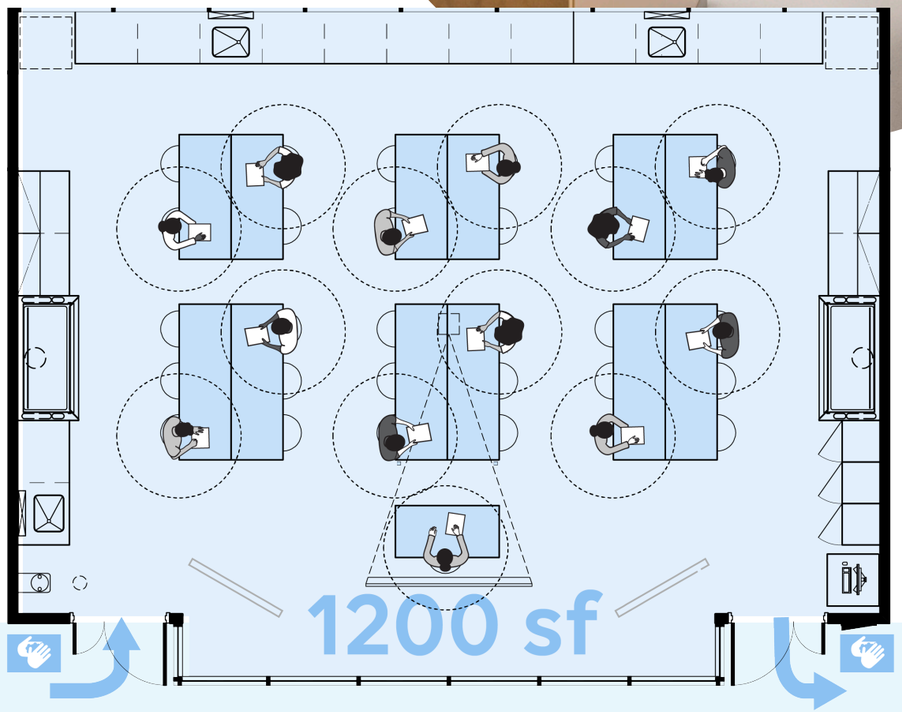
GENERAL CHEMISTRY LAB



30

40SF
PER SEAT

40%
OF ORIGINAL
CAPACITY



12

100SF
PER SEAT

432SF
QUEUING

OPTIMIZE SYSTEMS

Colleges and universities will also need to address challenges related to the infrastructure of campus facilities. Following are initial considerations identified by HGA's engineering team.

TECHNOLOGY

Evaluate technology masterplan for immediate and long-term needs. Incorporate accessible platforms that allow for remote, yet active participation for students and staff.

Establish BYOD (bring your own device) use and safety practices in coordination with shared resource lab reconfigurations.

Ensure ample Wi-Fi and cellular network coverage to support impromptu meetings in all spaces.

Ensure that technology and technology services are inclusive to all campus community members. Consider check-outs for devices and hotspots, as well as support that connects well with diverse groups.

Use campus technology and support personal devices for rapid screening of staff/students and to support any contact tracing efforts.

Deploy technologies to collect real-time occupancy data and provide real-time availability of campus spaces for safe use.

Leverage available relief funds and rebate opportunities for technology improvements for the campus and students through the CARES Act and associated Higher Education Emergency Relief Fund.

HVAC SYSTEMS

Ensure that each building's ventilation system is designed and operated to meet code and industry minimum outdoor air requirements.

A minimum MERV-13 filtration is recommended on building air circulation systems to begin removing any airborne coronavirus.

For mechanical systems with recommended filtration or higher, increase building air circulation.

Increase outdoor air quantities provided to occupied spaces when weather allows and where heating and cooling system infrastructure can effectively support increased outdoor air conditioning.

Where building systems can support active humidification through dryer or colder seasons, maintain building humidity levels between 40% and 60%.

For active sterilization of the coronavirus in occupied spaces, consider the use of Ultraviolet Germicidal Irradiation in air handling units or within the room.

Bi-polar ionization systems have been proven effective at sterilizing similar viruses to coronaviruses and are practical sterilization methods for existing, challenging mechanical systems.

HAVE YOU CONSIDERED...

- How technologies might ensure audibility of speakers also through face masks
- Leveraging building-down time to address critical deferred maintenance needs

RESOURCES

HGA has created a hub for our insights and reactions to the COVID-19 pandemic as architects, engineers, interior designers, and problem solvers. Follow the conversation here:

Experiencing COVID-19 / Coronavirus through the Design Lens

Additional HGA resources:

- *Back to Work: What Facilities Staff Can Do Right Now*
  Peter K. Dahl, Ph.D., LEED AP BD+C & O+M, CEM - Principal, HGA

- *Connect, Research, Apply: Developing Insights in Higher Education*
  Bryan Cannon, AIA - Design Principal, HGA
  Rebecca Celis, AIA, LEED AP BD+C - Principal, HGA

- *Minimizing Coronavirus Transmission through Hospital Mechanical and Plumbing Systems*
  Jeff Harris, PE, LEEP AP - Director of Engineering, HGA

- *Redefining Workplace*

- *Returning to the Workplace: COVID-19 Signage*

Other referenced resources:

- *Considerations for Reopening Institutions of Higher Education in the COVID-19 Era*
  American College Health Association (ACHA)

- *Understanding the Impact of Social Distancing on Occupancy*
  U.S. Fire Administration

NOTE TO OUR READERS

This document is intended to provide tools for planning purposes only and does not constitute recommendations regarding the safety of re-opening campuses. The timing, logistics and safety of returning to campus is an institutional decision.

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