HEALTH IMPACT ASSESSMENT
GUND HALL

FALL 2013
Harvard Graduate School of Design
SES0533000 Healthy Places
Prof. Ann Forsyth

Students:
Claire Albert
Nicole Kau’i Baumhofer
Ryan Bouma
Anna Brewster
Chuan Hao (Alex) Chen
Derek Galey
Eman Lasheen
Conner Maher
Abhinay Sharma
Sarah Simpson
Andrea Tentner
Hao Di Grace Xu

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Introduction and Summary of Recommendations

In 2013 the Healthy Places course in the Harvard Design School collaborated in creating a Health Impact Assessment (HIA) of the GSD campus at Harvard University. It included facilities in Gund, Sumner Rd, and Kirkland St. The exercise aimed to give the class experience conducting an HIA. In 2012 members of the class had also conducted an initial HIA of the GSD campus however due to time constraints could not (a) implement extensive new data collection, (b) look at the broader context of the GSD or (c) package the HIA in a way that could be easily implemented. The 2013 class had access to this earlier work and built upon it to create a joint HIA.

Students brainstormed relevant topics, divided up and conducted research on specific issues, and participated in a workshop to prioritize recommendations.

In the first stage of the HIA workshop, one key statement was taken from the individual reports that the participants produced. The participants then voted on the topic that they felt was the most important to the GSD’s Health. The results are reproduced below. The topic receiving the most votes was social interaction in the GSD, followed by food and sanitation. Vending machines do not adequately “serve the needs of students.”

<table>
<thead>
<tr>
<th>Part 1 Statement</th>
<th>Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>The lack of large bathrooms with multiple stalls...presents challenges to</td>
<td>8</td>
</tr>
<tr>
<td>maintenance, overall bathroom availability, and cleanliness.</td>
<td></td>
</tr>
<tr>
<td>Overall, the single best intervention that seems most likely to lead to</td>
<td>7</td>
</tr>
<tr>
<td>greater uptake of physical activity with greatest short-term plausibility and</td>
<td></td>
</tr>
<tr>
<td>most cost-effectiveness appears to be greater funding for student groups that</td>
<td></td>
</tr>
<tr>
<td>focus on physical activity or incorporate physical activity in their events</td>
<td></td>
</tr>
<tr>
<td>Overall, drinking water access in Gund Hall is good and appears to be</td>
<td>0</td>
</tr>
<tr>
<td>convenient and appealing enough for students to use</td>
<td></td>
</tr>
<tr>
<td>In the short term, the GSD can update existing couches and purchase additional</td>
<td>7</td>
</tr>
<tr>
<td>couches to provide places for students to nap.</td>
<td></td>
</tr>
<tr>
<td>All things considered, the direct threat level to GSD students [from crime]</td>
<td>0</td>
</tr>
<tr>
<td>is “minimal.”</td>
<td></td>
</tr>
<tr>
<td>Bicycle racks are often short on weekdays during class</td>
<td>4</td>
</tr>
<tr>
<td>Waste collection is a very well organized process and there seems to be an</td>
<td>0</td>
</tr>
<tr>
<td>abundance in waste bins throughout the entire building</td>
<td></td>
</tr>
<tr>
<td>As the GSD grows, different types of collaborative spaces for social</td>
<td>13</td>
</tr>
<tr>
<td>interaction will be needed</td>
<td></td>
</tr>
<tr>
<td>Provided with comfortable furniture oriented around shared tables, the pit</td>
<td>7</td>
</tr>
<tr>
<td>can be transformed into an opportunity for social interaction</td>
<td></td>
</tr>
</tbody>
</table>

The second stage involved brainstorming potential interventions, then voting on them. Some of the interventions with the highest votes are the potential to furnish the lobby for sociability, pit
redesign to promote sociability, the problematic culture of staying in studio for all hours, and more funding for student groups that promote physical activity.

Part 2

<table>
<thead>
<tr>
<th>Effects (+/-?)</th>
<th>Comments</th>
<th>Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>Potential to furnish lobby for sociability</td>
<td>12</td>
</tr>
<tr>
<td>+</td>
<td>Pit can promote sociability through design</td>
<td>9</td>
</tr>
<tr>
<td>-</td>
<td>Problematic culture of staying in studio all hours</td>
<td>8</td>
</tr>
<tr>
<td>+</td>
<td>More funding for student group for physical activity</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>(e.g. yoga, bike)</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>After hours food options are not healthy</td>
<td>6</td>
</tr>
<tr>
<td>?</td>
<td>People go home for healthy food</td>
<td>5</td>
</tr>
<tr>
<td>-</td>
<td>Cleaning light switches</td>
<td>4</td>
</tr>
<tr>
<td>?</td>
<td>People forced to go home to sleep</td>
<td>2</td>
</tr>
<tr>
<td>-</td>
<td>Cold temperatures all year</td>
<td>2</td>
</tr>
<tr>
<td>-</td>
<td>Gym memberships not free</td>
<td>2</td>
</tr>
<tr>
<td>-</td>
<td>Water fountains on first floor and library</td>
<td>2</td>
</tr>
<tr>
<td>-</td>
<td>Sleep won’t be solved</td>
<td>-</td>
</tr>
<tr>
<td>+</td>
<td>Building well maintained in terms of waste (sustainability etc.)</td>
<td>-</td>
</tr>
<tr>
<td>+</td>
<td>People feel safe</td>
<td>-</td>
</tr>
<tr>
<td>+</td>
<td>Everyone chooses active transportation</td>
<td>-</td>
</tr>
<tr>
<td>+</td>
<td>Physical activity focused groups doing well – strong leadership and demand</td>
<td>-</td>
</tr>
</tbody>
</table>

The final stage of the HIA involved the most specific and actionable items derived from the highest priority items of the previous round of voting. Though there are many ways to analyze the data the highest priority items are healthy vending machines, encouraging adequate sleep from top level administration, increasing the number of variety of lockers, more microwaves and refrigerators, prototyping or refurnishing the pit, extension of café seating to the Chauhaus, breaking up the uniformity of spaces by putting in different types of furniture to improve collaboration, and money to promote physical activity.

Task 3

<table>
<thead>
<tr>
<th>Statement</th>
<th>Number of high priority stickers</th>
<th>Number of lower priority stickers (still an important issue)</th>
<th>Total number of stickers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy vending machines</td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Start at the top to encourage adequate sleep</td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Improve storage / lockers, maybe change type</td>
<td>0</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>More fridges and microwaves</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Prototype – rent furnishing to test student designs, pop up experiments</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Café to Chauhaus – seating around columns</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Statement</td>
<td>Number of high priority stickers</td>
<td>Number of lower priority stickers (still an important issue)</td>
<td>Total number of stickers</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>----------------------------------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>or mezzanine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Break up repetitions – uniformly industrial – variety in working styles reflected in space</td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Some money to promote physical activity</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Change spaces to facilitate physical activity</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Have competition to incentivize physical activity</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Put in vegetation</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Donut more expressive and comfortable</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Redo Chauhaus furnishings to be more collaborative</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

The students’ reports are reproduced in subsequent chapters. They make the following recommendations:

**Air Quality**

**Short Term**
- Identify desks in the Trays that are more affected by cold air and position them in such a way that they don’t receive direct air from diffusers.
- Develop a platform to increase the interaction between building services and students so that immediate action can be taken when student reports a problem. This could be done through a simple mobile application, Facebook page, email, twitter or website.
- Organize competition or design charettes to arrive at a unanimous solution for Chauhaus and Lounge space usage and optimization.

**Long Term**
- Invest in indoor plants in the corridors and the trays to improve air quality and visual aesthetics of the space.
- Update the HVAC system to have more cooling zones and have control on the temperature and quantity of air distributed in each zone.
- Install HOBO’s (Temperature and Humidity monitors) and CO2 monitor in student spaces and develop a heating/cooling schedule based on the usage pattern derived from the data recorded by the devices.
- Upgrade to more real times monitoring devices that would provide more control points and live data to building service operators.
- Conduct surveys at regular interval to measure the change in air quality and HVAC system efficiency.
Commute

*Short Term*
- Increase the number of bike racks and disperse them in all corners of the GSD.
- Improve the visibility and the condition of the bike ramps.
- Exercise control over the parking regulation of the bicycles and remove bicycles promptly after a 10-day period.
- Increase signage across GSD to assist with way-finding.

*Medium Term*
- Widen the service area of the Evening Van and the decrease the wait time.
- Improve the lighting of the shortcuts to Sumner and Kirkland Street at night.

*Long Term*
- Improve the condition of the bus stops, e.g. weather-shelter.
- Widen the service area of the Evening Van and the decrease the wait time.
- Make transit passes more accessible to everyone, i.e. more subsidy and more choices on the type of passes.
- Increase the number of attractions along the streets frequented by GSD students traveling to and from classes.
- Improve the traffic control at the Cambridge/Quincy Street and Quincy/Kirkland Street intersection.

Food

*Short term*
- Change vending machine options to include healthy choices:
  - Harvard University has a contract with Berkshire Natural vending machines (Exhibit 5), which includes healthy products with no trans-fat, high fructose corn syrup, or artificial flavors. Prices are only slightly more expensive than the current vending machines ($1.50 for chips to $3.25 for chickpea salad). The GSD should request from Harvard University that one or more of these vending machines replace the existing unhealthy vending machines.

- Clearly label foods in Chauhaus with caloric and nutritional information:
  - The GSD should provide calorie counts on food to provide students with information at the point of sale. In addition, it would be helpful to provide general nutritional information through the Healthy Eating Plate (developed by the Harvard School of Public Health, Exhibit 6), which provides specific and accurate information on following a healthy diet. The Healthy Eating Plate could be provided in several ways (e.g. pamphlets, posters on the wall, placemats).
Medium term

- Create guidelines for daily offerings in Chauhaus with nutritional standards:
  - The GSD should consider negotiating its contract with Harvard Dining Services to ensure that the Chauhaus provides a reasonable number of healthy options with specific nutritional standards. To meet this goal, the GSD could consider expanding the salad bar and offering more vegetables with hot entrees.

- Contract with farmers’ market or local healthy vendor to operate a food stand on campus, particularly during evening hours and weekends:
  - To provide additional food options beyond the Chauhaus, vending machines, and the kitchenettes, the GSD should look into seeing if a food truck or small farmer’s market could operate close to the GSD. This would provide students with access to healthier food when options are less readily available on campus.

Long term

- Expand food prep and eating space in Chauhaus:
  - The GSD should consider expanding the kitchenettes and adding refrigerators to these spaces. By adding refrigerators to the kitchenettes, students would be able to bring food from home to enjoy while they are at the GSD. This would be especially helpful for nights and weekends when the Chauhaus is closed.

- Expand dining options available, potentially adding a coffee shop with later hours that serves healthy snacks:
  - The GSD should consider adding a small coffee shop to the campus to provide students with food and drink options after the Chauhaus is closed. A coffee shop would not only provide food and drinks but also a gathering area for students.

Physical Activity

Short term

- Increase funding for student groups (allocate some of each group’s funding for advertising campaigns to promote their activity and physical activity generally).
- Make existing restrooms more conducive to changing (remove unnecessary features that clutter the space, add hooks and/or shelving/cubbies where possible, and clean more frequently).
- In rooms regularly used for physical activity (Porticoes, Stubbins, etc.) purchase light easily moveable furniture and/or ask janitors to check reservation schedule and move furniture when reserved for physical activity.
- Add a water cooler or several on the first floor and keep it stocked.
Medium

- Look into reconfiguring some larger space in Gund to serve as a more dedicated space for physical activities (would not have to work around other event types, don’t have to worry about moving furniture, can have mirrors (GSDance), hooks, etc.).
- Encourage activity groups to organize events throughout the day instead of only in the evening.

Long

- Add more bathroom and/or changing facilities.
- Add water fountains or permanent water filtration/cooler systems near areas where physical activity typically takes place.
- Permanent, large indoor space dedicated for physical activity, configured appropriately with input from Student Forum and Student Groups that focus on physical activity.

Mental Health

Short term

- Professors can begin to change the culture of sleep from the top down by reducing their expectations about the amount of time students spend in studio.
- Update existing couches and purchase additional couches to facilitate napping.
- Install higher intensity daytime indoor lighting for the winter months.

Medium term

- Begin a planning programming that addresses student concerns about physical activity and social interconnectedness discussed in the focus group results.
- Space can also be allocated to activities that alleviate stress, such as table tennis and meditation.

Long term

- Spaces can be reallocated and redesigned to increase the amount of study spaces with natural lighting and that facilitate social interaction.

Safety

Short term

- Open blinds along windows facing bicycle racks to increase informal surveillance.

Long term

- Install mirror on the southern entrance to mitigate blind spots.
- Remove art work in northeast lawn.
- Display Gund Hall’s address for accident response and pedestrian notification.

Sanitation

Short Term
- Provide freestanding hand sanitizer stations in classrooms, lecture halls, floor lounges, and printers.
- Provide toilet seat liners and basic cleaning supplies in bathrooms.

Medium Term
- Increase bathroom cleaning frequency by increasing number of custodial staff.
- Perform routine light infrastructure maintenance such as painting walls, replacing missing tiles, covering up exposed ventilation ducts.
- Install fans to actively remove odor from the restrooms.
- Improve overall design through lighting, plants, etc.

Long Term
- Build more bathrooms.

Social Connections

Short term
- Look for ways to add flexible seating and gathering space in the gallery area on the first floor in the way a Hotel Lobby accommodates a variety of “third place” activities.
- The area immediately east of the Loeb Library entrance is a candidate location.
- In addition, the lobby/gallery area between the columns and Western wall of the Chauhaus kitchen is the appropriate dimension for café style seating, allowing the Chauhaus to “spill out” into the gallery without blocking the path of travel.
- These gathering spaces should introduce indoor plants and vibrant color in accent locations.

Medium term
- Expand the successful kitchenette spaces southward:
  - They can double in size with the displacement of only 5 desks each. Additional furnishings can be added, in a conversational pattern, to facilitate social exchange or collaborative work.
- Also, develop a rotating art exhibit where nature inspired artwork is placed at highly visible impact locations throughout the building.

Long term
- Consider more substantive changes to provide flexible spaces such as converting a portion of the eastern most tray on the second floor:
This space, could act as a less congested extension of the Chauhaus, more than doubling the productive socially space. A ramp will be needed from the second floor level to the mezzanine.

- Reconfiguration of the library is also another option provided the onsite storage of books becomes less necessary. Reconfiguring the library at the lower level offers opportunities for modest indoor recreation space and the equipment identified by the 2012 class.

Social Interactions

Short term

- Deploy plants and other natural elements throughout the trays, paying particular attention to offset the lack of daylight in the “cave” areas.
- Provide comfortable and socially-oriented furnishings in “the pit” for day-to-day student use. The space can be re-programmed as needed for studio production space.
- Extend Chauhaus hours with scaled-back selections at peak times. Increase the variety and reduce the prices of healthy options.

Medium term

- Allow users of the desk space to control the level of fluorescent lighting, offering the potential for savings, improved work environments, and greater personal agency.
- Initiate a “cosmetic makeover” of the lounge spaces, including replacement furniture, up-to-date technology, natural elements, and improved lighting.
- Explore opportunities for spill out seating in the lobby or along the mezzanine and second floor balconies to relieve crowding.

Long term

- Break up the monotony of the trays by providing spaces for group work. This strategy could make the trays more inclusive: even as the overall number of desks is reduced, more students can be flexibly accommodated.
- Install common use fridges, ovens, and coffee dispensers in the kitchenettes. Provide more comfortable and appealing furniture.
- Install a doorway to create a direct connection between the Chauhaus and outdoor patio. This strategy could help activate the GSD’s wood-frame houses by re-centering the campus around Gund’s backyard. The Chauhaus could also attract additional Harvard-wide patrons and raise the GSD’s profile.

Waste Management

Short term

- More reinforcement of cleanliness of waste bins.
- Addition of waste bins in toilet booth.
**Medium term**
- Raising Awareness of Gund hall users on waste reduction.
- Educating students through interaction and active participation by incentivizing waste reduction.

**Long term**
- Develop an action network within campus to further promote cooperation on sustainability initiatives targeting waste reduction and recycling like the 'Zero Waste' initiative.
- Study impacts of other health issues such as sleep deprivation and stress on consumption rates and waste generation to come up with effective waste reduction strategies.

**Water Fountains**

**Short term**
- Improve drainage of 4th floor drinking fountain.

**Medium term**
- Provide drinking water access in the basement workspace and the library.
- Rearrange water dispensers in Chauhaus to relieve congestion during meals.
- Personal communications with students have revealed a desire for more water on the 1st floor.
  - The drinking fountain between the restrooms is too slow to fill a water bottle quickly and the area around the dispensers in the Chauhaus is too congested to use during meal times unless one is also entering the area to purchase food. Moving the water dispensers to the area near the cutlery may relieve some of this congestion.
- Cups should also be moved to a less congested area for those students who do not have their own cups or bottles.

**Long term**
- Increase drinking water access on the 1st floor in room 110.
- Upgrade some fountains to bottle dispensers similar to the one located on the 5th floor.
- Considering the high volume of traffic on the 1st floor, increased water access would be beneficial.
- The fountains on the 2nd through 4th floors would benefit from upgrade to the double fountain/dispenser style already installed on the 5th floor to accommodate students who need rapid-filling for bottles and others who do not have a bottle or cup on hand.
Air Quality (Indoor)

By: Abhinhay Sharma

Background: Why Indoor Air Quality
Indoor Air quality is an important factor when it comes to human health as people spend almost 90% of their time indoors. In a research conducted by EPA it has been noted that air pollutant levels in indoor air may vary from 5 to 100 times the outside air. In recent comparative risk analysis studies conducted by EPA and Science Advisory Board (SAB), indoor air quality has consistently ranked among top five environmental risks to human health. Long–term exposure to bad air quality can have chronic health effects on occupants making them vulnerable to respiratory diseases and even lead to mental stress and reduced efficiency. In an empirical study conducted to measure the impact to proper air conditioning and its impact on children it has been found that air cleaning in combination with ventilation can effectively reduce symptoms for asthma sufferers. (2010) In another study conducted on sick building syndrome and indoor air quality it was established that lack of proper ventilation and accumulations of volatile components were responsible to determine the quality of air. (2013)

Description: The GSD community
The Graduate School of Design presents an interesting case of analyzing indoor air quality as there are number of features associated with the design school that are peculiar to its functions. Graduate school of design has a variety of students in different discipline with each department having a different requirement of time an effort from students. Students working in studio programs tend to spend a lot of time in trays, working mostly in the Gund Hall while MDes and DDes student attend classes and spent their time either in Loeb library or outside in Kirkland houses. Similarly all other departments have a different working schedule and usage of space in the Gund throughout the year. Thus it is apparent that the indoor air quality will impact different students in completely different ways.

To measure the impact of indoor air quality and how it affects the students a survey was released to students through email and response were recorded and compiled. Following tables provide a summary of the findings:
The above graph shows the percentage of responses for four air quality measures, divided into four measuring indices (Never, Sometimes, Most of the times and Always)
Observations
The data collected raises a concern about the air temperature in the building as majority of students have mentioned low air temperature as an issue of concern. There could be multiple reasons for this: It might be that the desks of the students are placed very near to the air diffusers and hence student might feel very cold, even though HVAC system is doing its appropriate function or alternately the HVAC system might be pumping too much cold air than required due to malfunctioning sensors. In either case there has to be a deeper analysis to understand the problem area with the use of more direct surveys and use of data monitoring devices. The Gund hall however does well on other parameters of air quality—odor and wind draft

In the survey another question was asked to mention the most uncomfortable area for students and following is the response analysis:

Through the data we can identify two areas that were identified by majority of the students – Lounge and Chauhaus. In the additional comments sections students mentioned that Lounges remained cold and unpleasant spaces partly due to over air conditioning and due to lack of proper furniture that made the space look dull and depressing. Kevin Cahill also mentioned in his interview that Building Services in Gund are attempting to change the furniture in the lounge and are experimenting with test furniture.

The Chauhaus is also the most problem area and most frequently visited area by the students. The main issue in the Chauhaus is terms of air quality is the high speed air convectors near the window seating that pump cold air most of the time. It is understandable that the role of convectors cannot be undermined given the large volume and open floor plan of the Gund.
There can be however passive design interventions that can mitigate the problem. The seating arrangement can be rearranged to move students away from convectors. The convectors themselves can be shielded behind a false partition to prevent draft air affecting the students sitting beside the convector.
List potential positive and negative impacts and use the table below to evaluate the severity and distribution of impact.

<table>
<thead>
<tr>
<th>Health Topic or issue (issue)</th>
<th>Positive or negative?</th>
<th>Likelihood of impact?</th>
<th>Differential impacts on groups</th>
<th>Distribution of impact?</th>
<th>Measurable indicator?</th>
<th>Evidence base for knowing about the issue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+++ strongly positive</td>
<td>Speculative Probable</td>
<td>(e.g. children, elderly, persons with disabilities, persons with lower incomes)</td>
<td>G = GSD H = Harvard M = Metro N = National</td>
<td></td>
<td>Surveys</td>
</tr>
<tr>
<td>Temperature too Low</td>
<td>+ + +</td>
<td>P</td>
<td>Students in Trays</td>
<td>G</td>
<td>Y</td>
<td>Surveys</td>
</tr>
<tr>
<td>Stale Air</td>
<td>+ +</td>
<td>P</td>
<td>Basement, Lounge and Library carrels</td>
<td>G</td>
<td>Y</td>
<td>Surveys</td>
</tr>
<tr>
<td>Fresh Air through doors in Trays</td>
<td>+</td>
<td>S</td>
<td>Students working in trays near doors</td>
<td>G</td>
<td>Y</td>
<td>Surveys/ Personal Interviews</td>
</tr>
<tr>
<td>Cold/Cough/Throat infection</td>
<td>- -</td>
<td>S</td>
<td>Students working in areas closers to diffusers</td>
<td>G, H</td>
<td>Y</td>
<td>Surveys/ Personal Interviews</td>
</tr>
<tr>
<td>Mental Stress due to lack of thermal comfort</td>
<td>U</td>
<td>S</td>
<td>All building users</td>
<td>G</td>
<td>Y</td>
<td>Surveys/ Personal Interviews</td>
</tr>
<tr>
<td>Physical stress due to lack of thermal comfort</td>
<td>- - -</td>
<td>P</td>
<td>All building users</td>
<td>G</td>
<td>Y</td>
<td>Surveys</td>
</tr>
<tr>
<td>Diffuser location</td>
<td>U</td>
<td>P</td>
<td>All building users</td>
<td>G</td>
<td>Y</td>
<td>Survey/Detailed MEP planning</td>
</tr>
<tr>
<td>Issue #1</td>
<td>Issue #2</td>
<td>Issues #3</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>----------</td>
<td>------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chauhaus</td>
<td>Lounges</td>
<td>Trays</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Identify potential changes to proposal to enhance each of the positive impacts or reduce negatives of issues identified above.

- Change the location of seats away from convectors.
- Install thermal sensors to regulate cool air.
- Provide an arrangement in which students can protect their desks from direct air from diffusers.
- Use soft furniture with fabric instead of metal chairs and tables to make the place warm.
- Introduce more furniture to invite students and make space more useful.
- Rearrange furniture to make sure all the desks get equivalent heating/cooling.
- Presence of natural elements
  - Give the lounges a defined function.
Recommendations:

Short Term

- Identify desks in the Trays that are more affected by cold air and position them in such a way that they don’t receive direct air from diffusers.
- Develop a platform to increase the interaction between building services and students so that immediate action can be taken when student reports a problem. This could be done through a simple mobile application, Facebook page, email, twitter or website.
- Organize competition or design charettes to arrive at a unanimous solution for Chauhaus and Lounge space usage and optimization.

Long Term

- Invest in indoor plants in the corridors and the trays to improve air quality and visual aesthetics of the space.
- Update the HVAC system to have more cooling zones and have control on the temperature and quantity of air distributed in each zone.
- Install HOBO’s (Temperature and Humidity monitors) and CO2 monitor in student spaces and develop a heating/cooling schedule based on the usage pattern derived from the data recorded by the devices.
- Upgrade to more real times monitoring devices that would provide more control points and live data to building service operators.
- Conduct surveys at regular interval to measure the change in air quality and HVAC system efficiency.

References


Ying Xu, Suresh Raja, Andrea R. Ferro, Peter A. Jaques, Philip K. Hopke, Cheryl Gressani, Larry E. Wetzel, 2010. Effectiveness of heating, ventilation and air conditioning system with HEPA filter unit on indoor air quality and asthmatic children’s health, Building and Environment, Volume 45, Issue 2, Pages 330---337.

Commute
By: Grace Xu

Overview of Findings
Improvements on street and pavement conditions are difficult as the process involves collaboration across schools, Harvard College, and the municipal. 17/22 (77%) of students who have had an accident traveling to and from Gund in the past year cycles. This is a significant number which shows that cycling conditions could be improved and that safety precautions could be more widely implemented. Only 16% of students who participated in the survey have used the Harvard Shuttle Services more than twice in the past week.

Background: Why this Topic Matters
Many urban areas are now actively promoting walking and cycling as an alternative transportation mode for short commutes. It promotes sustainable environment and physical exercise. Safety for pedestrians and cyclists are particularly relevant as 90% of GSD students walk or cycle to and from Gund. Adequate way-finding design is essential to universal design because it reduces stress, boosting health, and productivity (Evans and McCoy, 1998).

Description: The Situation at the GSD
Way-Finding
Adequate way-finding design is essential to universal design because it reduces the confusion of visitors and mistakes by students and faculty, saving time and money and preventing accidents. It also reduces stress, boosting health, and productivity (Evans and McCoy, 1998). The symmetry of Gund Hall induces user disorientation. Students often use south or west to describe the situation of the trays, e.g. 4th floor tray south. Some still experience confusion of orientations after some time spent in Gund.
With the exception of Loeb Library (Fig.1.) which has a prominent threshold, the Chauhaus, Piper auditorium (Fig.2.) and other lecture rooms are not immediate visible. Visitors are often lost past the main lobby. There is a lack of signage in general, only a screen by the main entrance on Quincy Street with a list of the rooms and offices (Fig.3.). Some of these rooms are known by their number and also aliases, e.g. 122-123 Portico, 112 Stubbins. There rooms can appear similar by architectural expression and adjacency in location. Other rooms do not have a number but only a name, e.g. Gropius on the basement level of the library. “The Pit” is an example of a space that is used as a crit room. Due to the unusual layout of rooms, lack of logic in numbering and naming the rooms, similarity of the rooms and symmetry of the plan, travel between classes can result in much back-and-forth between the south and west ends of the building.

Commute by Foot
48% of GSD students who participated in the survey prefer to walk to/from Gund. However, there is only 21% of students who have used the Harvard Evening Van or Harvard Shuttle more than twice in the past week.

Traffic Control
Gund Hall is adjacent to two relatively complicated intersections that are its nearest main entrances. Crossing is difficult for pedestrians because of the speed on the main roads and the multiple direction traffic coupled with complicated signals. The Cambridge/Quincy Street intersection particularly since cars are exiting the Cambridge Street underpass in high speed and the merging lane on Quincy Street. Since cyclists are riding on shared lanes, accident rates
exponentially increases. Observed illegal actions are results of long waiting times and complicated signals.

Figure 1. Cambridge / Quincy Street Intersection.
Sequence 1&2. Left-turning cyclist doesn’t stop for pedestrians crossing the street.
Sequence 3&4 Pedestrians also have a tendency to cross diagonally

Figure 2. Quincy /Kirkland Street Intersection.
Cars that are running a yellow light.
Pedestrians who are walking when the light is red.
Cyclist biking on the sidewalk.

Commuter on Bicycle
42% of GSD students who participated in the survey prefer to travel by bicycle. 17/22 (77%) of students who have had an accident traveling to and from Gund cycles. This is a significant number which shows that cycling conditions could be improved and that safety precautions could be more widely implemented.

Bicycle Racks
Bike racks are often短缺 on weekdays during class. There are 3 racks that fit about 100 bikes in total on the Quincy Street side and 2 racks on the Cambridge Street side with 50 bikes. There are 2 new racks with 10 spots outside of 20 Sumner. The Building Services does not seem to be living up to their warning sign posted by the racks, “bikes left for 10+ days will be discarded”. One student claims to have 2 bicycles locked up outside of Gund and one of them has not been moved in 3 months. By patrolling and removing bicycles left for 10+ days will open up significant amount of spaces of the racks.
**Bike Repair**

There are no bicycle repair shops within 10 minute walking radius from the GSD. The closest and the most economical solution would have been Quadbikes, a student-run bicycle repair shop on campus, had it not been recently in a hiatus status. There is one DIY bicycle repair station close to Gund on the Science Centre Plaza across from Memorial Hall. These stations are equipped with an air pump and basic hand tools such as screwdrivers, wrenches, and tire levers. For help with repairs users can scan the Quick Read (QR) code on the front of the station to view detailed instructions on their smart phones.

**Hubway/Bike-Share**

There is one Hubway station on Quincy outside of Gund recently added in 2013 with spaces for 15 bicycles. Annual membership for Harvard affiliates is $50 at a 40 percent discount. It is free for the first 30 minutes.

**Bicycle Safety Precaution**

General Laws of the Commonwealth of Massachusetts, Chapter 85, Section 11B enforces front and rear lights at night. Helmets are obligatory for riders under 16 years of age. Helmets drastically reduce the impact of bodily damage when accidents occur. Discounted Helmets are available for $9.00 at the Harvard CommuterChoice Office.

**Bicycle ramps**

One survey participant stated “There is only one curb cut on the Quincy and Kirkland side of the building and that is for pedestrians. Seems like a no brainer to put a curb cut on the little turn off outside the Quincy Street entrance.” One student missed the ramp Cambridge Street side and ran into one of the columns.
Commute by Public Transportation

9% of GSD who participated in the survey prefer public transportation for commute to/from Gund.

10/35 students whose daily commute amount to more than 20 mins each way
MBTA (See attached map)

T tickets are $2.00 with a Charlie Card, bus tickets $1.50. Student Services offer an 11% discount on semester-long MBTA passes. GSD is served by the Red Line at Harvard Square station, located at a 5-minute walk from the Gund. There are 3 buses with stops close by:

- #1 Dudley Sq via Mass Ave
- #69 Lechmere
- #86 Sullivan Sq. Sta via Johnston Gate

The MBTA system ends at 12:45am and starts again at 5am. Some students are impeded by this deadline, while others have to other means of transport (usually cars).

Harvard Shuttle Services (see Map 1)
Harvard Shuttles loop around campus 8am-4am and are most convenient for GSD students living at Peabody Terrace. Evening Van Service offers door to door service 7pm-2:30am. The service area is bounded by Beacon St to the northeast, Huron Avenue to the northwest, Western Avenue to the south. The shuttles tend to run after accumulating a certain number of students. The on-call service sometimes has a wait period up to an hour. Some students complain that the shuttle service is slower than walking since it stops frequently and drives circuitously to pick up or drop up students.

Only 16% of students who participated in the survey have used the Harvard Shuttle Services more than twice in the past week. The free service could reach out and service more students if the service area is extended past Beacon Street to the northeast of Gund, and the wait time is limited to a maximum of 30 minutes or less.
List potential positive and negative impacts and use the table below to evaluate the severity and distribution of impact.

<table>
<thead>
<tr>
<th>Health Topic or issue (issue)</th>
<th>Positive or negative?</th>
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<th>Distribution of impact?</th>
<th>Measurable indicator?</th>
<th>Evidence base for knowing about the issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Way-finding</td>
<td>-</td>
<td>P</td>
<td>All</td>
<td>G</td>
<td>Number of signs</td>
<td>Observation</td>
</tr>
<tr>
<td>Traffic control</td>
<td>-</td>
<td>P</td>
<td>All</td>
<td>M</td>
<td>Number of students who have had accidents</td>
<td>Observation Survey</td>
</tr>
<tr>
<td>Bike Racks</td>
<td>-</td>
<td>S</td>
<td>All cyclists</td>
<td>H</td>
<td>Number of bicycles parked</td>
<td>Observation Survey</td>
</tr>
<tr>
<td>Bike Repair (shops + DIY)</td>
<td>U</td>
<td>S</td>
<td>All cyclists</td>
<td>H</td>
<td>Number of stations</td>
<td>Observation Survey</td>
</tr>
<tr>
<td>Bike Ramps</td>
<td>-</td>
<td>P</td>
<td>All cyclists</td>
<td>G</td>
<td>Number of students who have had accidents</td>
<td>Observation Survey</td>
</tr>
<tr>
<td>Hubway/ Bike-Share</td>
<td>++</td>
<td>S</td>
<td>All</td>
<td>M</td>
<td>Number of bicycles + stations</td>
<td>Observation Survey</td>
</tr>
<tr>
<td>Bike Safety Precaution</td>
<td>+</td>
<td>P</td>
<td>All Cyclists</td>
<td>H</td>
<td>Number of students who have had accidents</td>
<td>Observation Survey</td>
</tr>
</tbody>
</table>
## Identifying Potential Changes to GSD Campus

<table>
<thead>
<tr>
<th>Issue #1</th>
<th>Issue #2</th>
<th>Issue #3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commute on Foot</strong></td>
<td><strong>Commute on Bicycles</strong></td>
<td><strong>Commute on Public Transport</strong></td>
</tr>
<tr>
<td>Improve the traffic control at the Cambridge/Quincy Street and Quincy/Kirkland Street intersection</td>
<td>Increase the number of bike racks and disperse them in all corners of the GSD</td>
<td>Improve the condition of the bus stops, e.g. weather-shelter</td>
</tr>
<tr>
<td>Increase the number of attractions along the streets frequented by GSD students traveling to and from classes.</td>
<td>Improve the visibility and the condition of the bike ramps</td>
<td>Make transit passes more accessible to everyone. i.e. more subsidy and more choices on the type of passes.</td>
</tr>
<tr>
<td>Improve the lighting of the shortcuts to Sumner and Kirkland Street at night</td>
<td>Exercise control over the parking regulation of the bicycles and remove bicycles promptly after a 10-day period.</td>
<td>Widen the service area of the Evening Van and the decrease the wait time</td>
</tr>
<tr>
<td>Increase signage across GSD to assist with way-finding</td>
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</tbody>
</table>

*Identify potential changes to proposal to enhance each of the positive impacts or reduce negatives of issues identified above.*
Recommendations

Short Term
- Increase the number of bike racks and disperse them in all corners of the GSD.
- Improve the visibility and the condition of the bike ramps.
- Exercise control over the parking regulation of the bicycles and remove bicycles promptly after a 10-day period.
- Increase signage across GSD to assist with way-finding.

Medium Term
- Widen the service area of the Evening Van and the decrease the wait time.
- Improve the lighting of the shortcuts to Sumner and Kirkland Street at night

Long Term
- Improve the condition of the bus stops, e.g. weather-shelter.
- Widen the service area of the Evening Van and the decrease the wait time.
- Make transit passes more accessible to everyone. i.e. more subsidy and more choices on the type of passes.
- Increase the number of attractions along the streets frequented by GSD students traveling to and from classes.
- Improve the traffic control at the Cambridge/Quincy Street and Quincy/Kirkland Street intersection.

References


Food
By: Claire Albert and Anna Brewster

Background: Why this Topic Matters
Food environment characteristics often affect purchasing behaviors and attitudes related to food. In turn, these food attitudes and behaviors influence dietary choices (Wells et al. 2007, 24). Diet, especially caloric and fat intake, has been linked to many diseases, including cardiovascular disease, diabetes, birth outcomes, and even cancer (Willett 1994, 532). The effect of diet on cardiovascular disease is of particular concern, as heart disease is the number one killer of adults in the United States and disproportionately affects racial and ethnic minorities (Centers for Disease Control and Prevention). On the other hand, many foods, such as fruits and vegetables, can protect against disease (Willett 1994, 532). Due to these important health impacts, it is important to understand how people interact with different food environments. The food environment can include both the small-scale environment (portion sizes and packaging) and the large-scale environment (food availability and accessibility) (Wells et al. 2007, 12).

Scope and Data Sources
This portion of the HIA concentrates on both the small-scale food environment and the large-scale food environment of the GSD. To fully assess the food environment, we gathered data through participant observation, a focus group, and a survey. We also utilized information from a previous HIA of Gund Hall by Rachel Banay, Healthy Places 2012. Current food options for purchase at the GSD include: Chauhaus café and vending machines. Additionally, small kitchenettes are available for students who bring food from home.

Overview of Findings:
Chauhaus is small and often crowded, leading students to go elsewhere for food
Most students are satisfied with the quality of food offered at Chauhaus
Chauhaus hours of operation are limited
Students would like coffee and healthy snacks during evening hours and weekends
Vending machine options are unpopular and students would like healthier choices

Description: The Situation at the GSD

Chauhaus Café
The main source of food in Gund Hall is the Chauhaus café located on the ground floor (Exhibit 1). Chauhaus is operated by Harvard Dining Services and is open from 7:30am-7:00pm Monday-Thursday and 7:30am-4:00pm on Fridays. Breakfast and lunch are served each weekday, and there are extended hours with ready-to-go sandwiches, salads, and snacks during the evening. According to a survey of GSD students, 34% of respondents somewhat or strongly agreed that Chauhaus was their primary source of breakfast, while 66% agreed the cafe was their primary source of lunch. Focus group participants also described Chauhaus as their “go-to” or “default”
choice for food, mainly due to convenience and lack of time to go elsewhere.

While not large, Chauhaus does offer a sizeable variety of both healthy and unhealthy foods. On a typical day, the lunch offerings include a fairly extensive salad bar (Exhibit 2), hot and cold pasta, soup, chili, meat and vegetarian panini, and a hot entrée. Offerings also include a variety of breads, fruits, cookies, chips, soft drinks, coffee, tea, and juices. According to observation on a weekday at noon, the amount of starchy carbohydrates, including pastas, rice, rolls, cookies, muffins, bagels, and chips (Exhibit 3), greatly outweighed the amount of fruit and vegetable options. On this particular day, there were not offerings of hot vegetables with the entrée, though many students did supplement their panini or hot dish with a small salad. It is important to note that food in Chauhaus is competitively priced when compared to food other nearby establishments (Banay 2012).

From observing 50 patrons, the most popular choices were the hot entrée of rice and chicken curry and the hot panini station, though the salad bar was a close third. The salad bar was fairly robust, with cold vegetable and protein options, though the dressing selection was limited and only had one low-fat option. There was a selection of apples, oranges, and bananas on display, though they were placed above the customer’s line of vision on the top of the salad bar, and not many people choose fruit on this day. In a survey of 127 students, only 5.5% “strongly agreed” that Chauhaus offered a good selection of healthy foods, though approximately half (49.6%) “somewhat agreed.”

The serving sizes appeared reasonable for most patrons and the smaller size of the containers may help limit over-consumption. While caloric and nutritional information is available on the Harvard Dining Services website, there is no information within the Chauhaus itself and most students are not aware that they can access this information. In addition, it is difficult to calculate this information for an entire meal.

A major complaint identified in the health assessment is that the hours of operation for Chauhaus are too limited, and there are not many options in the evening time. Although Chauhaus offers “extended hours,” according to their website, the offerings past 4pm are very limited. Approximately half (46%) of surveyed students expressed unhappiness with the hours Chauhaus operates. In a focus group of students, evening food options were a major complaint, with many students saying that either do not eat or go home because there are few appealing options in Gund Hall. The availability of coffee was the main complaint in the focus group, and the availability of healthy snack options was also a concern.

Vending Machines
In addition to the Chauhaus, there are also a four vending machines throughout Gund Hall (example in Exhibit 4). These machines offer traditional, unhealthy “snack foods” that are energy dense and nutrient poor. These snacks include chips and candy bars, with a few vending machines also offering apples, sandwiches, and some healthy options on occasion. Prices range from $1.00 for snacks like chips and candy to $2.50 for sandwiches and soup. Only 1.57% of surveyed students “strongly agreed” that the vending machines in Gund Hall offered a good
selection of snack foods, with approximately 2/3rds of students expressing dissatisfaction with the vending machines. In a focus group of students, most participants said they had never used the vending machines and did not feel it was adequately serving their needs.

Kitchenettes
There are also kitchenettes for food preparation in the student lounges on floors 2-5 of Gund Hall. These are equipped with a small microwave, a sink, and a water dispenser. Although these may provide a healthy alternative to purchasing food in Gund or elsewhere, the lack of common refrigerators does inhibit full utilization of the kitchenettes. The previous HIA found that many students keep small refrigerators under their desks, but students without desks and many faculty do not have this option (Banay 2012).
List potential positive and negative impacts and use the table below to evaluate the severity and distribution of impact.

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Chauhaus Hours</td>
<td>- -</td>
<td>S</td>
<td>N/A</td>
<td>G, possibly H</td>
<td>possibly</td>
<td>Byrd-Bredbenner et al., 2012</td>
</tr>
<tr>
<td>Vending Machine options</td>
<td>- - -</td>
<td>P</td>
<td>N/A</td>
<td>G</td>
<td>yes</td>
<td>Hanks et. al., 2012</td>
</tr>
<tr>
<td>Chauhaus food options</td>
<td>-/+</td>
<td>S</td>
<td>N/A</td>
<td>G, possibly H</td>
<td>yes</td>
<td>Wells et al., 2007</td>
</tr>
<tr>
<td>Size and space of Chauhaus</td>
<td>-</td>
<td>S</td>
<td>persons with disabilities, lowers incomes</td>
<td>G, possibly H</td>
<td>possibly</td>
<td>Hanks et. al., 2012</td>
</tr>
<tr>
<td>Serving sizes and containers</td>
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<td>P</td>
<td>N/A</td>
<td>G, possibly H</td>
<td>yes</td>
<td>Sonnenberg et al., 2013</td>
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<tr>
<td>Lack of refrigerators</td>
<td>-</td>
<td>P</td>
<td>persons with food allergies, special diets</td>
<td>G</td>
<td>yes</td>
<td>Sonnenberg et al., 2013</td>
</tr>
<tr>
<td>Lack of health/nutritional info</td>
<td>- -</td>
<td>P</td>
<td>N/A</td>
<td>G, possibly H</td>
<td>yes</td>
<td>Sonnenberg et al., 2013</td>
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## Identifying Potential Changes to GSD Campus

<table>
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<tr>
<th>Issue #1 Hours</th>
<th>Issue #2 Vending Machines</th>
<th>Issues #3 Chauhaus options</th>
<th>Issues #4 Health information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify potential changes to proposal to enhance each of the positive impacts or reduce negatives of issues identified above.</td>
<td>Open small part of Chauhaus for later hours</td>
<td>Include healthier options in vending machines</td>
<td>Increase healthy options in the Chauhaus</td>
</tr>
<tr>
<td>Increase number and quality of vending machines, with coffee and more substantial foods</td>
<td>Subsidize healthy food by raising prices of unhealthy options</td>
<td>Offer discounts on healthy options</td>
<td>Implement a food labeling system (e.g. traffic light system)</td>
</tr>
<tr>
<td>Allow outside vendor to set up small stand for evenings and weekends</td>
<td>Replace unhealthy vending machines with healthy vending machines (Exhibit 5)</td>
<td>Eliminate SSBs</td>
<td>Provide general health information, including the Healthy Eating Plate (Exhibit 6)</td>
</tr>
<tr>
<td>Increase signage across GSD to assist with way-finding</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

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Recommendations

**Short term**
- Change vending machine options to include healthy choices:
  - Harvard University has a contract with Berkshire Natural vending machines (Exhibit 5), which includes healthy products with no trans-fat, high fructose corn syrup, or artificial flavors. Prices are only slightly more expensive than the current vending machines ($1.50 for chips to $3.25 for chickpea salad). The GSD should request from Harvard University that one or more of these vending machines replace the existing unhealthy vending machines.

- Clearly label foods in Chauhaus with caloric and nutritional information:
  - The GSD should provide calorie counts on food to provide students with information at the point of sale. In addition, it would be helpful to provide general nutritional information through the Healthy Eating Plate (developed by the Harvard School of Public Health, Exhibit 6), which provides specific and accurate information on following a healthy diet. The Healthy Eating Plate could be provided in several ways (e.g. pamphlets, posters on the wall, placemats).

**Medium term**
- Create guidelines for daily offerings in Chauhaus with nutritional standards:
  - The GSD should consider negotiating its contract with Harvard Dining Services to ensure that the Chauhaus provides a reasonable number of healthy options with specific nutritional standards. To meet this goal, the GSD could consider expanding the salad bar and offering more vegetables with hot entrees.

- Contract with farmers’ market or local healthy vendor to operate a food stand on campus, particularly during evening hours and weekends:
  - To provide additional food options beyond the Chauhaus, vending machines, and the kitchenettes, the GSD should look into seeing if a food truck or small farmer’s market could operate close to the GSD. This would provide students with access to healthier food when options are less readily available on campus.

**Long term**
- Expand food prep and eating space in Chauhaus:
  - The GSD should consider expanding the kitchenettes and adding refrigerators to these spaces. By adding refrigerators to the kitchenettes, students would be able to bring food from home to enjoy while they are at the GSD. This would be especially helpful for nights and weekends when the Chauhaus is closed.

- Expand dining options available, potentially adding a coffee shop with later hours that serves healthy snacks:
  - The GSD should consider adding a small coffee shop to the campus to provide students with food and drink options after the Chauhaus is closed. A coffee shop would not only provide food and drinks but also a gathering area for students.
Exhibit 1: Chauhaus

Exhibit 2: Salad bar in the Chauhaus

Exhibit 3: Starchy carbohydrates in the Chauhaus
Exhibit 4: Vending machine in Gund
Products include: Chips, Crackers, Candy, Cookies

Exhibit 5: Berkshire Natural Healthy
Vending machine products include: Granola bars, Nuts, Dried fruit, Chickpea and tabouli salads
Exhibit 6: Healthy Eating Plate

References


Physical Activity

By: Andrea Tentner

Overview of Findings
The picture that emerges is of a student body that is often wrapped up in an intense work environment, fairly sleep-deprived, and feels like the GSD culture is not very supportive of decisions to include more physical activity. Students tend to live close to campus and cycle or walk a short distance in to campus most days of the week, with many remaining there for the larger portion of their waking hours. While most students choose active transportation methods, commutes are often not long enough to accumulate a significant amount of physical activity. Students overwhelmingly want to include more physical activity but feel cramped for time, lack support for prioritizing physical activity from their environment, and also cite weather as a factor in discouraging physical activity (whether this is in regards to outdoor physical activity or transport to that physical activity). There is high awareness of participation in and support for existing GSD-sponsored opportunities for physical activity among students, as well as a strongly expressed desire for more of the same as well as a wider variety of options. Overall, the single best intervention that seems most likely to lead to greater uptake of PA with greatest short-term plausibility and most cost-effectiveness appears to be greater funding for student groups that focus on physical activity or incorporate physical activity in their events. A greater proliferation of these groups will naturally lead to more advertising for events incorporating PA, and for PA in general, and therefore to an environment more supportive of prioritizing PA. Other interventions to seriously consider include increasing the amount of storage space available for assignment to individuals as permanent storage, as well as certain infrastructural changes suggested by student group activity leaders, ranging from easy and cheap (adding hooks in bathrooms to store bags and clothes) to hard and expensive (adding bathroom facilities, water fountain).

Background: Why this Topic Matters
The CDC recommends getting at least 150 minutes of moderate physical activity per week, which calculates out to 30 minutes of physical activity most days of the week, in order to ward off weight gain that can lead to obesity and increased risk of a wide range of negative health outcomes such as diabetes, heart disease and cancer. Physical activity also has clear and proven benefits for improving mental acuity and allaying stress, anxiety and mental health issues.

Background: Current Physical Activity Options at the GSD

Subsidized GSAS Gym Membership
The GSD partially subsidized gym membership at campus gyms run by GSAS. A membership for the academic year costs GSD students $230, or less than $30 per month. While some larger schools fully subsidize gym membership, the GSD is not last in subsidy level. For example, full academic year membership costs $350 for students in both the Divinity School and the
Kennedy School (http://recreation.gocrimson.com/recreation/membership/graduate). Laura Snowdon, Dean of Students at the GSD on the gym membership subsidy at the GSD:

“It is true; quite a few of the larger Harvard schools subsidize their students’ memberships by 100%. We subsidize quite a bit of the cost but not the entire cost. As you can see, every school determines its own policy; ideally, we would be able to subsidize them 100% as well, but we aren’t there yet.”

Student Groups Focused on or Incorporating Physical Activity

There are at least 5 student groups funded by Student Forum that are focused on, or incidentally incorporate, physical activity: GSDance, Travel GSD, Yoga GSD, GSD Soccer Club and Wiffle GSD. Descriptions of each of these groups and their offerings as pulled from their self-descriptions on the GSD Student Activities website are listed below, along with additional information summarized from group leader survey responses, where available.

Yoga GSD is open to students of all abilities in an effort to promote physical and emotional wellness. Classes are taught by Elizabeth Brown on Mondays and Wednesdays at 7 PM. All classes are free to students. Loaner mats are available for newcomers, and beginners are always welcome. Elizabeth can be contacted at steepedingrace.com. Primary Contact: Annie Boehnke

Yoga GSD meets twice a week for an hour in Gund, either in Stubbins or the porticoes, usually Monday/Wednesday, 7-8pm. They have been around since 2009. Usually, 40-50 students attend each session, with participation dropping off to more like 25 students per session around midterms and finals. Participation is free for students and friends of students. They get funding from Student Forum, and largely use the money to hire a professional yoga instructor. Sessions are generally at a moderate intensity PA level but range from moderate to vigorous. Advertising is only within the GSD, including a session at orientation to introduce new students, and a reminder via email through Student Announce once on the day of each session. They would like reliable access to a large enough space to accommodate the large numbers of students they have participating (they cite the fact that there are nights where there are special events in the spaces they do use — Piper, or all three porticos — and on these nights, there is no other space that is large enough to accommodate the class, so it has to be canceled). Additionally, they would like to have rooms cleared of chairs when they have been reserved for yoga. They would also like water fountains near the porticoes and, ideally, additional restroom facilities on the first floor. Existing GSD bathrooms, where people currently change, should be cleaner, and it would be helpful to have hooks to hang backpacks and clothes. Access to additional changing facilities and/or showers would be helpful. Most people go home to shower.

GSDANCE connects the GSD community through the medium of dance. It is open to all members of the GSD and provides a space of inclusion free of competition or judgment— the only requirement for membership is the desire to move one’s
body. Group activities include, but are not limited to: a weekly open level, multi-
style dance class, specialized dance workshops throughout the year, and group
performances/recitals for those interested. GS (just) DANCE! Primary Contact:
Jacqueline Park, Secondary Contact: Kayla Lim

GSDance meets once a week for an hour in Gund, either in Stubbins or the porticoes, usually
Wednesday nights, 8-9pm. This is their first semester. They have a core group of 10 students
that consistently come, usually have 10-20 participants, and sometimes have as many as 25
students show up. Participation is free for students and their guests. They get funding from
Student Forum, and largely use the money to hire professional instructors to come in and teach.
Sessions start with stretching for 20 minutes (low intensity PA); the rest of the session is spent
learning a dance (low to moderate intensity PA). Advertising is only within the GSD, via email
(email through Student Announce once the day before and once day of) and word of mouth.
Some participants change, others dance in street clothes. Most participants go home to
shower. They would like more funding in order to be able to consistently bring in a professional
instructor once a week (the organizers currently fill in as teachers during several weeks to cover
gaps where funds fall short). They would like mirrors to facilitate teaching dances.

TravelGSD aims to foster a deeper understanding of architecture, landscape
architecture and urban design by providing first hand experiential opportunities
outside the gates of Harvard. In doing so, it aspires to enhance the quality of
student life at the GSD and provide a healthy outlet to the high stress
environment of Gund Hall. Primary Contact: Mazyar Kahali, Secondary Contact:
Iman Fayyad

Travel GSD organizes at least one off-campus event per month; sites are in and around
Cambridge and Boston. They took over from an existing, similar group in September of 2013.
Events have included anywhere from 13-26 participants. Participation is subsidized by funds
provided by Student Forum, but there is often a fee for students ranging from $10-$30 in order
to cover transportation and entrance fee costs. Students are often transported to the off-
campus site by rented bus/van/car; Once on-site, events are generally at a low intensity of PA
(walking around, etc.) Advertising is only within the GSD, including emails through Student
Announce, and sign-up sheets at events like Beer and Dogs, Student Group Fair, etc. They would
like more funding in order to subsidize a larger portion of transportation and entrance fee costs
for students. They would also like help planning and/or providing transportation to and from
distant sites, and suggest that if GSD were to provide a shuttle or bus for these events it would
be much easier to organize additional trips.

GSD Soccer Club aims to provide a space for all members of the GSD community to
engage in organized physical fitness and interact socially outside the context of
studio. GSD Soccer Club’s aim is to provide the financial resources and equipment
necessary for GSD members to both play recreationally and compete in graduate
school intramural leagues. Through a check-out system, any member of the GSD
community will be entitled to borrow equipment for their own recreation. Primary Contact: Natsuma Imai

**WiffleGSD** is a social group comprised of students interested in coming together to play or watch the sport of wiffleball. Its core mission is to provide a stress outlet to the student body through the hosting of wiffleball events once a month in Piper Auditorium. The sport of wiffleball provides a recreational outlet to students of all athletic backgrounds and abilities. Primary Contact: Tim Zeitler

**Outdoor Courtyard Area/Basketball Court**
There is a courtyard outside Gund Hall which can be viewed from the full-window walls of the Chauhaus. This space was not specifically studied in the current HIA. However, in the 2012 HIA the authors comment of the space:

“Behind Gund Hall, an open grassy area and basketball court provide additional opportunities for recreation. In fair weather, the lawn is often occupied by people having lunch and studying, but it is occasionally used for Frisbee or soccer. People use the basketball hoop infrequently. A student group, M.Arch Madness plays games twice a week and has approximately 25 participants. The AsiaGSD student group also uses the basketball hoops approximately one to two times per week. These outdoor activities are somewhat whether (sic) dependent, however.”

**Incidental/Work-related Physical Activity**
The amount of physical activity students and other occupants of the GSD campus get on an incidental basis (e.g. walking between facilities, stair-climbing) also was not specifically studied in the current HIA, mostly due to an assumption that regardless of how optimal the environment is made for incidental physical activity, it is unlikely to be a mechanism to accumulate significant physical activity. However, in the 2012 HIA, the authors comment:

“Physical activity within the GSD campus is also influenced by the arrangement of the built environment. Gund Hall has many heavily used staircases to travel between the five floors (plus basement) of the building. Some staircases, such as the open staircases in the trays seem to be regularly used, though observation and interviews would be needed to quantify how much they are used and who is using them. Since these stairs run through the student desks in the trays, it is possible that they are not used as much by faculty, staff, and visitors.

The remaining staircases are located at the outside edges of the building, near the elevators. These staircases are well lit and provide nice views from the upper floors, but they can be cold and difficult to locate. The staircases are sometimes tucked away behind doors, which makes the elevator a more obvious and
attractive choice. Photo 1 shows the main elevator on the first floor of Gund Hall, with the stairs tucked out of sight.”

Background: Do students at the GSD get enough physical activity? The good news is that nearly 50% of students somewhat or strongly agree with the statement that, between leisure activity and active transport, they get 30 minutes of physical activity most days of the week. The flipside of this is that a bit more than 50% somewhat or strongly disagree with this statement, and almost 90% of students somewhat or strongly disagree with the statement that they get as much physical activity as they want most weeks. There is clearly a lot of room for improvement here.

Background: Do GSD students spend much of their physical time on the GSD campus? About 70% of students strongly agreed with the statement that they spend more than 40hrs per week at the GSD campus, while only 22% strongly disagreed with the same statement. Because so many students spend such a large proportion of their waking hours on campus, interventions on the GSD campus to encourage and/or facilitate physical activity have the potential to strongly influence the amount of physical activity students get.
Description: The Situation at the GSD

Should we target level of subsidy for gym memberships as a way to increase physical activity among GSD students?

Design school students can get a partially subsidized gym membership. While many of the larger schools (e.g. GSAS, HMS, SPH) fully subsidize membership, most of the smaller schools (e.g. GSE, Div) only partially subsidize. Also, while one student in the focus group said that she would more likely go to the gym if it were included in tuition, another focus group attendee said they would be less likely to use it if it were free, because it would seem ‘less valuable’, and another student I spoke to explained that even though he had purchased a gym membership, he had not once used it, because he was too busy and was not prioritizing the gym.

Conclusion: No, because 1) it is financially difficult for the school at this time, 2) there is little to no evidence that further subsidization would increase gym usage.

<table>
<thead>
<tr>
<th>Design School - Full Year</th>
<th>$290</th>
<th>$580</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design School - Academic Year</td>
<td>$230</td>
<td>$460</td>
</tr>
<tr>
<td>Design School - Summer</td>
<td>$60</td>
<td>$120</td>
</tr>
<tr>
<td>Design School - Fall</td>
<td>$115</td>
<td>$230</td>
</tr>
<tr>
<td>Design School - Spring</td>
<td>$115</td>
<td>$230</td>
</tr>
</tbody>
</table>

Should we target the time students spend commuting as a way to increase physical activity among GSD students?

90% of students already use active transport (cycle or walk) to commute to and from the GSD, but the majority (more than 75%) either strongly or somewhat disagree with the statement that their daily commute is 20 minutes or more each way. The overall impression here is that the large majority of GSD students live quite close to the GSD campus, that they generally already walk or cycle in, and that, for most students, this active commuting time is not enough time/distance to get in the desired/desirable level of physical activity. There might still be some room to encourage the 9% that take public trans to consider active transport, but in general commuting does not seem to be an obvious opportunity area for increasing physical activity.

Conclusion: Maybe. Some small marginal gains might be made here, but the numbers suggest it is mostly saturated. Think about this getting numbers even further up as part of a larger physical activity promotional advertising campaign and/or facility improvements at the school.
Should we target improvements in showering or storage facilities as a way to increase physical activity among GSD students?

According to Kevin Cahill, there are 2 showers for men and 1 shower for women, along with at least 20 lockers, on the Cambridge side of the building. Lockers here are day lockers, not permanent storage spaces for individual students. In focus group responses, no students had used these showers. In informal conversational settings, several students talked about the need for more lockers or storage facilities, stating that students in some programs had no permanent assigned storage space on campus. Additionally, more than 60% of students surveyed somewhat or strongly agreed with the statement that improved showering or storage facilities would make it easier to participate in physical activities during the day or to cycle or walk in. It is unclear whether students who do not use the showers do not do so because 1) they don’t know about them, 2) they don’t want to use them because they are unappealing or inconvenient, or 3) they are not available when they want to use them because there are too few for the demand. The need for making permanent storage space available to more students seems clear.

Conclusion: Assess feasibility of adding additional locker space and/or converting day lockers to assigned permanent storage space for individual students. Assess shower facilities for cleanliness, appeal, convenience – think about ways to improve these aspects, as well as possible advertising of shower facilities. Do not consider adding new shower facilities at the moment – these are expensive and difficult infrastructural changes and there is no evidence as of yet that there is demand for additional facilities.
Figure: (Left) Students bring their own locks to use these small lockers in the basement of Gund, (Right) The single shower available for women in the basement of Gund

Should we target improvements in GSD sponsored opportunities for physical activity as a way to increase physical activity among GSD students?
More than 80% of surveyed students knew about some or all of the currently offered free or low-cost opportunities for physical activity sponsored by the GSD. In the focus group also, several students brought up some of these activities without being prompted, indicating that the current options are relatively well advertised, and students had good things to say about these activities (‘GSDance is good, it made me sweat’). Consistent with this awareness and positive perception of GSD sponsored physical activity opportunities, almost 90% of students somewhat or strongly agreed with the statement that there should be more free or low-cost opportunities for physical activity on campus. The organizers of Yoga GSD report that they usually draw 40-50 participants per session to each of two weekly sessions, suggesting there is a lot of demand for programming like this. Additionally, when surveyed, almost half of students agreed that they prefer to get their physical activity in a way that lets them socialize at the same time. In focus group conversation, one student brought up bicycling as an appealing option for a new group activity.
Conclusion: Yes, students want more free or low cost activity opportunities on campus, and they indicate that they will participate in them if they are offered. This intervention has the potential to be cost-effective as it does not have to require additional expensive infrastructure, and can use relatively little extra funding to reach a wider range and number of GSD students.
I know about free or low-cost opportunities for dance, yoga, soccer, wiffleball and off-campus field trips sponsored by the GSD [Physical Activity]

- **Strongly disagree**: 5 (5%)
- **Somewhat disagree**: 13 (12%)
- **Somewhat agree**: 46 (42%)
- **Strongly agree**: 46 (42%)
- **N/A**: 0 (0%)

There should be more free or low-cost opportunities for physical activity on campus [Physical Activity]

- **Strongly disagree**: 2 (2%)
- **Somewhat disagree**: 11 (10%)
- **Somewhat agree**: 24 (22%)
- **Strongly agree**: 71 (65%)
- **N/A**: 2 (2%)

I prefer to get my physical activity in a way that lets me socialize at the same time (e.g. team sports) [Physical Activity]

- **Strongly disagree**: 23 (21%)
- **Somewhat disagree**: 29 (26%)
- **Somewhat agree**: 41 (37%)
- **Strongly agree**: 10 (9%)
- **N/A**: 9 (8%)
List potential positive and negative impacts and use the table below to evaluate the severity and distribution of impact.

<table>
<thead>
<tr>
<th>Health Topic or issue (issue)</th>
<th>Positive or negative?</th>
<th>Likelihood of impact?</th>
<th>Differential impacts on groups</th>
<th>Distribution of impact?</th>
<th>Measurable indicator?</th>
<th>Evidence base for knowing about the issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote active commuting</td>
<td>+/0</td>
<td>S</td>
<td>Active commuting is more difficult for those with children, those who live far away, and those who have a physical disability. It might also be more difficult for income-constrained people (good outdoor wear for winter is expensive).</td>
<td>G</td>
<td></td>
<td>Student survey</td>
</tr>
<tr>
<td>Further subsidize gym membership fees</td>
<td>+/0</td>
<td>S</td>
<td>Would probably be best for single students, as these would likely be the most highly subsidized; gym memberships are more expensive for families and will likely remain so regardless of increased subsidy, additionally this would likely not help increase PA in faculty, staff or contract workers</td>
<td>G</td>
<td></td>
<td>Survey of students, informal interviews, focus group</td>
</tr>
</tbody>
</table>

Legend:
- +++ strongly positive
- ++ moderately positive
- + mildly positive
- 0 neutral
- - mildly negative
- -- moderately negative
- --- strongly negative
- U uncertain
<table>
<thead>
<tr>
<th>Promote a cultural environment supportive of prioritizing PA (e.g. promotional campaign)</th>
<th>++</th>
<th>S</th>
<th>Depending on how this is implemented, it could be very inclusive—people making posters, events, emails should be cognizant of their different potential audiences and try to target as wide a range as possible without diluting the message.</th>
<th>G</th>
<th>1) Survey students asking them whether they feel supported in prioritizing PA, 2) whether they get as much PA as they want (progress from baseline?), 3) whether they get 30min of PA most days of week (progress from baseline?)</th>
<th>Survey of students, focus group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote, support, and fund more on-campus, student-group sponsored opportunities for PA</td>
<td>+++</td>
<td>P</td>
<td>This would likely be the most inclusive of the options; most of the existing groups allow any GSD affiliates free access, including friends and, I assume, family if they want to join in. This would also include staff and faculty and contract workers, although it seems they are often on evening hours which might bias participation towards students and those without families. If further support was given, perhaps daytime events could take place. Most current opportunities are likely not disability friendly, might want to try to encourage group leaders to consider this where possible.</td>
<td>G</td>
<td>Survey activity leaders about 1) number of PA opportunities offered (progress from baseline?), 2) number of students participating <em>ALSO</em> 2) and 3) from above</td>
<td>Survey of students and activity leaders, focus group</td>
</tr>
</tbody>
</table>
| Increase / improve showering / storage / changing facilities | + | P | This might especially help people who have to look professional while on campus and students in programs that do not already have assigned storage space | G | 1) Measure locker uptake among added 2) survey activity leaders about ease of changing for participants, 3) survey students about adequacy of storage/ changing facilities (change from baseline), 4) survey students about shower use (change from baseline?) | Student survey, focus group, activity leader survey, Kevin Cahill,
## Identifying Potential Changes to GSD Campus

<table>
<thead>
<tr>
<th>Issue #1</th>
<th>Issue #2</th>
<th>Issue #3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Funding</strong></td>
<td><strong>Storage</strong></td>
<td><strong>Infrastructure</strong></td>
</tr>
</tbody>
</table>

Identify potential changes to proposal to enhance each of the positive impacts or reduce negatives of issues identified above.

- **Issue #1 (Funding):**
  - Increase funding for student activity groups focusing on physical activity or having a physical activity component;

- **Issue #2 (Storage):**
  - Increase number of lockers available for assignment to individuals as permanent storage

- **Issue #3 (Infrastructure):**
  - Hooks and better cleanliness in existing bathrooms
  - Increased funding for promotional campaigns by student groups for their specific activity and PA in general
  - Find existing appropriate larger spaces and reconfigure them to be available and easily used for physical activity purposes (easily movable furniture, mirrors, some privacy but not isolated.)

- **Issue #3 (Infrastructure):**
  - Allow outside vendor to set up small stand for evenings and weekends
Recommendations

*Short*
Increase funding for student groups (allocate some of each group’s funding for advertising campaigns to promote their activity and PA generally)
Make existing restrooms more conducive to changing (remove unnecessary features that clutter the space, add hooks and/or shelving/cubbies where possible, clean more frequently)
In rooms regularly used for PA (Porticoes, Stubbins, etc.) purchase light easily moveable furniture and/or ask janitors to check reservation schedule and move furniture when reserved for PA
Add a water cooler or several on the first floor and keep it stocked

*Medium*
Look into reconfiguring some larger space in Gund to serve as a more dedicated space for PA activities (would not have to work around other event types, don’t have to worry about moving furniture, can have mirrors (GSDance), hooks, etc.)
Encourage activity groups to organize events throughout the day instead of only in the evening,

*Long*
Add more bathroom and/or changing facilities
Add water fountains or permanent water filtration/cooler systems near areas where PA typically takes place
Permanent, large indoor space dedicated for PA, configured appropriately with input from Student Forum and Student Groups that focus on PA

References
Student activity group leaders survey Student survey
Student focus group
Informal interviews (Healthy Places class members) Kevin Cahill
Laura Snowdon
2012 HIA of Gund and GSD Campus, and references therein
Mental Health

By Sarah Simpson

Overview of Findings
Individual, interpersonal, and institutional level factors and the physical environment affect the mental health of graduate students (Byrd & McKinney, 2012). This chapter outlines findings from a survey and focus group conducted with students at the at the Harvard Graduate School of Design (GSD) in order to assess how these systematic and environmental factors affect the health of students. Notably, survey results show an overwhelming proportion of students have recently felt nervous, anxious or on edge; felt constantly under strain; and been unable to get 8 hours of sleep per night because of school demands. Participants in the focus group echoed similar concerns and provided recommendations about what the GSD could do to improve the mental health outcomes of its students. Short-, medium-, and long-term recommendations are outlined.

Background: Why this Topic Matters
Graduate students face immense intellectual demands, which notably place constraints on their time and may result in high levels of stress, inadequate sleep, and poor mental health. In addition, graduate students may be more stressed than their undergraduate counterparts because graduate studies provide less guidance, require more self-motivation, and include pressures related to research, teaching, publishing, finding employment, and the expectations of advisors. Studies suggest that there is a high prevalence of mental health needs among graduate students. In order to address these issues, it is necessary to gain a better understanding of the characteristics of higher education that lead to poor mental health among students (Hyun, Quinn, Madon, & Lustig, 2006).

According to the ecological model, mental health outcomes are determined by multiple factors working on multiple levels, including individual, interpersonal, and institutional levels. Byrd and McKinney (2012, p. 186) define the individual level as “a student’s physical, cognitive, and emotional health as well as intrapersonal functioning, including internal influences and individual capacities such as self-esteem, coping abilities, and self-perceptions of skills and competencies,” the interpersonal level as “how well students function in the social environment, including their involvement in social activities and their satisfaction with various social and academic aspects of their college experience,” and the institutional level as “the educational setting, including the academic requirements and curricula, teaching practices, and the social and institutional climate. The physical environment can also directly affect mental health through crowding, noise, indoor air quality, and light, among other factors (Evans, 2003). While it is important to consider the entire system in which individuals and populations live, this chapter will focus on institutional level and physical environment determinants of student mental health in order to assess the health impacts of the Harvard Graduate School of Design (GSD) on its students.
Mental health, stress, and sleep are inextricably linked and associated with health and academic performance of students. The sleep behaviors of college students have been characterized by sleep deprivation, poor sleep quality, and excessive daytime sleepiness. There is growing evidence suggesting that poor sleep patterns are related to 1) impaired academic performance, 2) physical health, and 3) psychological well-being. However, the temporal relationship between sleep and these outcomes is not clear (Wong et al., 2013). Institutional factors related to academic performance and workload can become chronic stressors that negatively impact mental and physical health. One study of graduate students reported that nearly 50 percent of respondents had experienced a stress related problem that significantly affected their well-being or academic performance (Byrd & McKinney, 2012). It is clear that a vast majority of students experience stress and sleep deprivation related to academic demands, and these factors can negatively affect mental health.

Moreover, mental health, stress, and sleep are also linked with topics outlined in other chapters of this HIA, including physical activity, social interaction, and social connectivity. Graduate student life can be socially isolating. Long hours doing research and working in studio in the case of GSD students can strain social relationships, prevent physical activity, and intensify mental health issues (Hyun et al., 2006). Taken as a whole, initiatives to improve stress levels, sleep, physical activity, and social interaction, among other sections offered in this HIA, will take steps toward improving student mental health at the GSD.

Survey Results
GSD students (N=144) spend a large portion of their time at school, evidenced by the fact that 77 percent of survey respondents somewhat or strongly agreed to the statement “I spend more than 40 hours per week on the GSD campus” (Figure 1). Notably, 66 percent of respondents stated that they spend the majority of their time at school in the trays. Given that students spend so much time on campus, it is important to understand institutional level factors and the physical environment of the GSD affect the sleep patterns, stress levels, and mental health of students. Specifically, the trays are an appropriate place to target interventions based on these findings.

![Figure 1: I spend more than 40 hours per week on the GSD campus](image)

An alarming proportion of students (85 percent) somewhat or strongly agreed that they have recently felt nervous, anxious, or on edge (Figure 2). Just over 50 percent of students somewhat
or strongly agreed that they have recently been able to concentrate on whatever they are doing. Furthermore, 90 percent of survey respondents strongly or somewhat agreed that they have recently felt constantly under strain (Figure 3). These results indicate that there is an urgent need to address mental health amongst GSD students. While individual and interpersonal factors play a role, it is likely that targeted changes to the culture of the institution and the physical environment could lead to better mental health outcomes GSD students.

While a smaller proportion (57 percent) of students surveyed somewhat or strongly agreed that they are usually able to see out a window while at the GSD, many comments arose about natural and indoor lighting issues. Students commented that the basement, some areas within the trays, and specifically room 109 lack natural lighting. Survey responses suggest that students would be more satisfied with the space overall if indoor lighting were improved throughout the school, but especially if lighting were improved in these areas.

Finally, survey results suggest that GSD students are afflicted by a “culture of sleeplessness” that is commonly believed to exist at schools of design (Nash, 2012). 93 percent of students somewhat or strongly agreed that they have recently been unable to sleep 8 hours per night because of school demands (Figure 4). In a previous HIA of the GSD, Nash (2012, pp. 2) stated, “Students may perpetuate this by taking pride in sleepless nights as a rite of passage into their profession or a mark of dedication to the craft. Faculty and even studio reviewers have the power to further this notion by assigning or expecting unrealistic or unevenly distributed workloads assuming that students will sleep an unhealthily small amount.” Many students
resort to sleeping at the GSD; however, 62 percent of students surveyed somewhat or strongly disagreed that they felt they could find a safe place to sleep at school (Figure 5).

![Figure 4: I have recently been unable to sleep 8 hours per night because of school demands](image)

![Figure 5: If I had to sleep at the GSD, I feel I could find a safe place to do so](image)

Focus Group Results
During one focus group held with GSD students, several trends surrounding sleep, stress, and mental health emerged, and students made recommendations about what the GSD could do as an institution to improve student mental health. The participants agreed that most students get less than 6 hours of sleep per night even though students need more than 6 hours of sleep to “feel normal” and “perform better.” One student stated, “If you have to contribute to your team and you are tired it looks bad.” Another student said that studio culture is to blame and “there is peer pressure to stay at studio instead of sleep.”

Lack of sleep was also attributed to class schedules and studio progress. One student stated that she consistently stayed up all night on Tuesdays because several reading responses were due on Wednesdays. Participants suggested that the GSD could spread out class times and consider assignment schedules to facilitate student sleep, especially during the first year when students are getting acquainted with the material and careful reading is essential. In addition, the GSD could offer learning strategy or time management workshops for students.
The participants also voiced that they would like more places to nap, although in contrast to the survey results, they felt that they would be able to find a safe place to sleep at the GSD. They suggested that the school provide more sofas to facilitate naps. Participants in the MDes program said that the lack of studios makes it so they have no place to keep their things or take a nap, so they find a common room or library instead. They suggested that the library should remain open longer, stating that if the GSD library is closed, they go to other libraries in order to sleep. In addition, participants stated that they would like dedicated spaces for physical activity like table tennis and increased access to yoga classes.

Participants also commented on areas within the school that do not get adequate sunlight. MDes students stated that since their department is in the interior, they do not get much light during the day. One student said that on days when she spends a lot of time there, she feels disoriented because she is unable to look out a window to see what the weather is like. In addition, some participants stated that they prefer to work in other libraries rather than the GSD library because it is in a basement with no windows. One participant suggested that the GSD environment in itself is stressful, stating, “Maybe it’s the openness, everyone can see you working, you feel exposed.” Participants suggested that the GSD could create outdoor programs so that students could get outside and take tours together.

Participants also spoke about the isolated culture of the GSD, saying that it is anti-social and does not mix with other schools. They suggested having programming that facilitates mixers where GSD students, alumni, professors, and students from other schools can meet each other. Additionally, one participant stated that the GSD should take advantage of technologies being used at other schools to maximize students’ time and reduce stress levels. For example, he stated that the MIT media lab has more efficient equipment, more flexible schedules, and a culture of working in groups to split tasks. Finally, participants suggested that the GSD’s observance of more holidays and provision of longer breaks would reduce student
List potential positive and negative impacts and use the table below to evaluate the severity and distribution of impact.

<table>
<thead>
<tr>
<th>Health Topic or issue (issue)</th>
<th>Positive or negative?</th>
<th>Likelihood of impact?</th>
<th>Differential impacts on groups (e.g. children, elderly, persons with disabilities, persons with lower incomes)</th>
<th>Distribution of impact?</th>
<th>Measurable indicator?</th>
<th>Evidence base for knowing about the issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change the culture of sleep from the top down (ex. professors change expectations about amount of time spent in studio)</td>
<td>+++</td>
<td>Speculative</td>
<td>Probable</td>
<td>G</td>
<td>Number of hours students sleep per night</td>
<td>Survey data and in class discussions</td>
</tr>
<tr>
<td>Update and provide additional furniture (especially couches) throughout the GSD</td>
<td>++</td>
<td>P</td>
<td>None foreseen</td>
<td>G</td>
<td>Number of students sleeping on couches</td>
<td>Focus group results</td>
</tr>
<tr>
<td>Organized programming to get students outside together</td>
<td>++</td>
<td>P</td>
<td>Persons with physical disabilities may be unable to participate</td>
<td>G</td>
<td>Number of students participating in program</td>
<td>Focus group results</td>
</tr>
<tr>
<td>Increased Yoga programming</td>
<td>+++</td>
<td>P</td>
<td>Persons with physical disabilities may be unable to participate</td>
<td>G</td>
<td>Number of students participating in program</td>
<td>Focus group results</td>
</tr>
<tr>
<td>Dedicated spaces for stress relief (table tennis, meditation)</td>
<td>+++</td>
<td>P</td>
<td>Persons with physical disabilities may be unable to participate</td>
<td>G</td>
<td>Number of students using spaces</td>
<td>Focus group results</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----</td>
<td>---</td>
<td>---------------------------------</td>
<td>---</td>
<td>--------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>More study space with windows</td>
<td>+++</td>
<td>P</td>
<td></td>
<td>G</td>
<td>Number of students using spaces</td>
<td>Focus group results</td>
</tr>
<tr>
<td>Student social gatherings</td>
<td>++</td>
<td>S</td>
<td></td>
<td>H</td>
<td>Number of students attending gathering</td>
<td>Focus group results</td>
</tr>
<tr>
<td>Learning strategy and/or time management workshops for GSD Students</td>
<td>++</td>
<td>P</td>
<td></td>
<td>G</td>
<td>Number of students attending workshops</td>
<td>Focus group results</td>
</tr>
<tr>
<td>Extending library hours</td>
<td>+++</td>
<td>S</td>
<td></td>
<td>H</td>
<td>Number of students using library during extended hours</td>
<td>Focus group results</td>
</tr>
<tr>
<td>More holidays and longer breaks</td>
<td>+++</td>
<td>S</td>
<td></td>
<td>G</td>
<td></td>
<td>Focus group results</td>
</tr>
</tbody>
</table>
Identifying Potential Changes to GSD Campus

<table>
<thead>
<tr>
<th>Issue #1</th>
<th>Issue #2</th>
<th>Issues #3</th>
<th>Issues #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of napping and sleep space*</td>
<td>Natural and indoor lighting*</td>
<td>Reallocate the arrangement of desks in trays</td>
<td>Changing the culture of sleep at the GSD from the top down</td>
</tr>
</tbody>
</table>

Identify potential changes to proposal to enhance each of the positive impacts or reduce negatives of issues identified above.

<table>
<thead>
<tr>
<th>Increase the quantity of couches throughout the GSD</th>
<th>Provide larger windows in west-facing classrooms and offices*</th>
<th>Arrange desks in a way that fosters social interaction</th>
<th>Professors reduce expectations about the number of hours students spend in studio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve the quality of lounge and auditorium couches*</td>
<td>Increased amount of study space with windows</td>
<td>Provide more spaces for students to store personal belongings</td>
<td>Reallocate assignments and class schedules based on student concerns about time</td>
</tr>
<tr>
<td>Formalize napping areas for students during the late evenings through a quiet lounge policy*</td>
<td>Intensify daytime indoor lighting during the winter*</td>
<td>Arrange desks in a way that reduces the feeling of surveillance</td>
<td>Discourage students’ pride in sleepless nights</td>
</tr>
<tr>
<td>Signage for quiet nap areas such as the winter garden in the CGIS building*</td>
<td>Dim lights after dark to encourage students to get more sleep</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address student concerns about finding a safe place to nap through increased security</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Recommended in previous year’s HIA on sleep (Nash, 2012).
Recommendations
Survey and focus group results indicate that GSD students have extensive concerns related to their mental health. By focusing on interventions that address sleep and stress, the GSD may be able to alleviate mental health issues among students. In the short term, professors can begin to change the culture of sleep from the top down by reducing their expectations about the amount of time students spend in studio. The GSD can also update existing couches and purchase additional couches to facilitate napping. The GSD can also install higher intensity daytime indoor lighting for the winter months. In the medium term, GSD can begin planning programming that addresses student concerns about physical activity and social interconnectedness discussed in the focus group results. Space can also be allocated to activities that alleviate stress, such as table tennis and meditation. Finally, in the long term, spaces can be reallocated and redesigned to increase the amount of study spaces with natural lighting and that facilitate social interaction.
References


Safety
By: Conner Maher

Introduction
The intention of this Health Impact Assessment (HIA) is to evaluate the perception of safety and security in and around Gund Hall. Does the perception of security coincide with the reported incidents of crime? In addition, are there structural changes that could increase the safety of students while decreasing their stress?

Crime and individual safety are important factors that should be considered when evaluating the built environment. Not only is there an immediate risk of injury during a criminal act, but are also the additional traumas that may follow. “Stress may exacerbate hypertension and other stress-related behaviors, and may lead people to engage in smoking and other unhealthy behavior strategies of stress reduction” (Ellen, et al, 2001). If an individual fears their environment, regardless if empirically based, this can negatively influence their health. In this regard, perception is reality.

Methodology
The HIA relied on multiple methods of data collection. An anonymous survey was conducted via email to the student listserve. Of the hundred plus students responding, most everyone answered all of the questions. The survey inquired perceived levels of safety after normal working hours in and around Gund Hall, and if students felt comfortable leaving valuables on their desk unattended. This survey provided a necessary baseline to initially gauge student’s opinion of personal security.

A desk study was conducted of Harvard University’s Public Police Log. The police blotter is a daily list of events in which the public contacts law enforcement for assistance. All the incidents surrounding a two-block radius of Gund Hall were annotated. While this does not represent every incident that could lead to increased stress from the surrounding area, it does give a basic idea of the reported criminal and suspicious behavior.

Perceptions of safety:
GSD is open to students 24 hours a day and students working throughout the night or well into the evening could have increased feelings of vulnerability when the building closes. After hours, access is only granted to Gund Hall at the main entrance with a GSD affiliated id card. While only one door remains operational for entering, unwanted visitors could follow an authorized person in, or any of the doors could be propped open.
Even with the possibility of unauthorized access, a majority of students feel safe in Gund Hall after hours. In the table below, 92 percent of students felt safe and of those 79 percent strongly agree that they feel safe. This is an extremely positive indicator to student well-being and reduced stress from security concerns, as so much time is dedicated to study in the trays. Not having to think about safety while working allows students the opportunity to dedicate more attention to their coursework.

Since students work late hours, their commute home in the night or early in the morning could make them more vulnerable to incidents of crime. It was necessary to gauge the levels of insecurity for the surround area of Gund Hall. While students still feel relatively safe when leaving Gund Hall, this is not as the same level as inside the building. Fifty eight percent of students perceive their environment as fairly safe when they commute home. There was a drastic increase in those that slightly disagree that they feel safe, as 36 respondents felt safe inside Gund Hall but switched to increased vigilance upon exiting the building.

GSD students arguably spend more time in the trays than anywhere else in their lives. Due to the specialized studies and time spend in the trays, there are a range of valuables scattered throughout the studio desks. While theft is a non-violent crime, being a victim of such act can cause an individual to ultimately lose trust in their surroundings. Therefore, a question was raised how comfortable a student felt about unattended belongings within their “personal space.”
Most of the students do not trust leaving their belongings unattended within Gund Hall. Seventy percent of students do not feel they cannot safely leave their valuable possessions unattended, there is perception that theft could exist if given the right circumstances.

Interview with Kevin Cahill
After a brief interview with Kevin Cahill, the facilities manager, I was able to get a better understanding of the internal security of Gund Hall. When visitors and students alike enter the main doors of Gund Hall, they are greeted by the front desk, which is normally staffed by a contracted security guard. Mr. Cahill related that while there are a few hundred contracted guards conducting the security around Harvard University who regularly rotate assignments, Gund Hall has 4 regular guards to work the front desk with a small select pool of qualified guards to fill in. The small presence is out of a desire to have a recognizable face interacting with the population. Additionally, guards who are familiar with the nuances of the building will be more likely to recognize suspicious behavior and report it to the police.

Site analysis
There are multiple features that can be undertaken to improve the perceived security of the site. Increasing the difficulty of committing a crime and the limiting the perceived rewards, perpetrators are less likely to be compelled to conduct criminal behavior. Using a Crime Prevention Through Environmental Design checklist, a site analysis was conducted in and around Gund Hall under three main concepts (CPTED Checklist, 2011).

The natural surveillance of the site is the first aspect that a person will experience when entering a building. This largely deals with increased visibility and orientating building entrances towards high-traffic areas. Gund Hall is positioned between Cambridge St. and Kirkland St., both busy thoroughfares with high amounts of vehicle and pedestrian traffic.
Proper access control will physically guide people’s movement of space but also create a perception of risk for offenders. Gund Hall has ample ground floor windows looking outside the building and providing informal surveillance. There are additional features that also help provide informal surveillance around the building. The bus stop and bicycle share rack on the northwest section of the building allow people to cluster and provide mutual security.

The physical attributes that express ownership help extend the buildings sphere of influence over the property. Well-maintained foliage or properly defined lines by sidewalks or fencing create a unique ‘sense of place’. The grounds surrounding Gund Hall are free of foliage that could impede visibility and the sidewalks on the northeast side offer clearly delineated uses of space.
Northeast side of Gund Hall: sidewalks and low walls delineating uses of space

North side of Gund Hall: Foliage well-maintained
Limited visibility due to art wall in northeast portion of Gund Hall

Blind spot when exiting southern door

With any possible breaches in safety, security personnel regularly patrol the building. Occupying the front desk; Securitas personnel operate on 2nd and 3rd shift during the weekdays
from 5 pm to 8 am. During the weekend, security is provided 24 hours a day. Each security officer conducts regular rounds of the entire building, and the houses on Kirkland, by registering their personalized barcode at different security points throughout the sites.

Crime trends
There can be a large disparity between perceptions of crime and the actual trends in criminal activity. Monitoring all reported calls for assistance, Harvard Police Department (HPD) maintains an online daily record of events in their Public Police Log. Using the few blocks around Gund Hall as a boundary, I tallied the amount of times law enforcement was contacted for assistance. From September 16, 2013 to November 13, 2013 there were a total of 19 incidents that HPD responded to. All of these episodes were non-violent in nature and ranged from a late night noise complaint from Gund Hall to lost property.

Incidents reported to Harvard Police Department

<table>
<thead>
<tr>
<th>Date</th>
<th>Incident</th>
<th>Location</th>
<th>Date</th>
<th>Incident</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-Sep</td>
<td>Suspicious activity: individual w/out</td>
<td>48 Quincy St (Gund)</td>
<td>11-Oct</td>
<td>Suspicious activity: individual gone</td>
<td>48 Quincy St (Gund)</td>
</tr>
<tr>
<td></td>
<td>identification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23-Sep</td>
<td>Unwanted guest: Individual sent away</td>
<td>48 Quincy St (Gund)</td>
<td>14-Oct</td>
<td>Loud party</td>
<td>48 Quincy St (Gund)</td>
</tr>
<tr>
<td>23-Sep</td>
<td>Unwanted guest: not on Harvard property</td>
<td>48 Quincy St (Gund)</td>
<td>14-Oct</td>
<td>Suspicious activity: attempted bike theft</td>
<td>48 Quincy St (Gund)</td>
</tr>
<tr>
<td>29-Sep</td>
<td>Suspicious activity: two disconnected</td>
<td>48 Quincy St (Gund)</td>
<td>21-Oct</td>
<td>Lost Property</td>
<td>Anneberg Hall, 18</td>
</tr>
<tr>
<td></td>
<td>phone calls</td>
<td></td>
<td></td>
<td></td>
<td>Kirkland St</td>
</tr>
<tr>
<td>30-Sep</td>
<td>Theft: bicycle with cable</td>
<td>48 Quincy St (Gund)</td>
<td>4-Nov</td>
<td>Theft: bicycle</td>
<td>Haskins Hall 28</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Irving St</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Broadway</td>
<td></td>
<td></td>
<td>St.</td>
</tr>
<tr>
<td>2-Oct</td>
<td>Theft: bicycle with cable</td>
<td>48 Quincy St (Gund)</td>
<td>6-Nov</td>
<td>Disturbance</td>
<td>45 Quincy St (</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Queenshead)</td>
</tr>
<tr>
<td>3-Oct</td>
<td>Suspicious activity: car parked with engine</td>
<td>CGIS - South 1730</td>
<td>7-Nov</td>
<td>Unwanted guest: not on Harvard property</td>
<td>48 Quincy St (Gund)</td>
</tr>
<tr>
<td></td>
<td>running</td>
<td>Cambridge St.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Oct</td>
<td>Suspicious activity: tagging a vending</td>
<td>CGIS - South 1730</td>
<td>8-Nov</td>
<td>Suspicious activity: took custody of</td>
<td>48 Quincy St (Gund)</td>
</tr>
<tr>
<td></td>
<td>machine</td>
<td>Cambridge St.</td>
<td></td>
<td>unsecured bicycle</td>
<td></td>
</tr>
<tr>
<td>3-Oct</td>
<td>Theft: unattended wallet</td>
<td>Sanders Theatre: 18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kirkland St</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The most serious reports of crime were the bike thefts outside Gund Hall. In both instances, the locks were cut and the bikes stolen. It is unknown if the bikes were ever recovered, but as a result HPD did increase their patrols of Gund Hall. On more than one occasion, I witnessed officers inspecting the bike racks and was personally warned by one officer as to the dangers of using a cable lock with the recent thefts.
List potential positive and negative impacts and use the table below to evaluate the severity and distribution of impact.

<table>
<thead>
<tr>
<th>Health Topic or issue (issue)</th>
<th>Positive or negative?</th>
<th>Likelyhood of impact?</th>
<th>Differential impacts on groups (e.g. children, elderly, persons with disabilities, persons with lower incomes)</th>
<th>Distribution of impact?</th>
<th>Measurable indicator?</th>
<th>Evidence base for knowing about the issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased rounds conducted by security</td>
<td>+++</td>
<td>Speculative Probable</td>
<td>G = GSD H = Harvard M = Metro N = National</td>
<td>Count patrol frequency</td>
<td>Building manager, interview</td>
<td></td>
</tr>
<tr>
<td>Increased elevated lighting</td>
<td>++</td>
<td>P</td>
<td>Increased duty for security staff</td>
<td>H</td>
<td>Count elevated lights</td>
<td>Observation</td>
</tr>
<tr>
<td>Lighting supports visibility</td>
<td>+</td>
<td>P</td>
<td></td>
<td>H</td>
<td>Observation</td>
<td>Observation</td>
</tr>
<tr>
<td>Maintained foliage</td>
<td>+++</td>
<td>P</td>
<td></td>
<td>H</td>
<td>Observation</td>
<td>Building manager, interview</td>
</tr>
<tr>
<td>Blind corners</td>
<td>- - -</td>
<td>P</td>
<td>People could feel less safe</td>
<td>H</td>
<td>Observation</td>
<td>Observation</td>
</tr>
<tr>
<td>Other visual obstructions</td>
<td>-</td>
<td>P</td>
<td></td>
<td>H</td>
<td>Observation</td>
<td>Observation</td>
</tr>
<tr>
<td>More holidays and longer breaks</td>
<td>+++</td>
<td>S</td>
<td></td>
<td>G</td>
<td></td>
<td>Focus group results</td>
</tr>
</tbody>
</table>
Recommendations
All things considered, the direct threat level to GSD students is minimal. While this does not diminish perceived risk, it does indicate that students are not likely to be subject to a violent crime in and around Gund Hall. Granted, there are multiple steps that could be taken to increase the safety associated with the surrounding environment.

*Short term*
Open blinds along windows facing bicycle racks to increase informal surveillance

*Long term*
Install mirror on the southern entrance to mitigate blind spots
Remove art work in northeast lawn
Display Gund Hall’s address for accident response and pedestrian notification

References


Sanitation
By: Chuan Hao (Alex) Chen

OVERVIEW OF FINDINGS
There is a shortage of Women’s bathrooms
Overall Cleanliness appears to be adequate, though floor is often littered
Focus group seems to feel that the bathroom conditions are satisfactory
There seems to be sufficient bathroom supplies
There are overlooked areas such as light switch plates that should be cleaned
Odor is a significant problem in the private unisex bathrooms

BACKGROUND
“Sanitation and hygiene are critical to health, survival, and development.” (Center for Disease Control 2012) Basic sanitation facilities to allow proper disposal of waste can prevent the spread of many diseases conditions. (CDC 2012) In last year’s HIA, Negrete (2012) focused on fomites as an area of sanitation concerns. “Keeping hands clean through improved hand hygiene is ... important... to avoid getting sick and spreading germs to others. Many diseases and conditions are spread by not washing hands with soap and clean, running water ... if soap and water are unavailable, use an alcohol-based hand sanitizer that contains at least 60% alcohol.” (CDC, 2013) Reducing exposure to germs is a dimension of sanitation, and equipment and procedures that help facilitate such processes such as clean bathrooms and hand washing know-how is important in reducing exposure to harmful germs. In this Health Impact Assessment of Gund, sanitation facilities and practices for bathrooms are evaluated.

DATA COLLECTION METHODOLOGY
Several methods were used in the evaluation. An inventory and analysis of occupant number and bathroom facilities, including the availability of various bathroom equipment, was undertaken. A focus group was conducted to evaluate overall impressions of sanitation in Gund and to solicit suggestions. Some individual interviews were done to get an idea of individual behaviors and perceptions of bathroom sanitation. Black lights were also used as a quick qualitative measure to look for bodily fluids and stains on various surfaces. Personal observations round out the data collected. During the data collection process, a separate project that was tracking how occupants felt about Gund, called GUND CITY, was occurring as well. As the survey for the project was posted directly on the bathroom walls, a sample of the data collected from that process was looked at as well as the surveys were posted on the bathroom walls. Lastly, relevant insights gathered from the Health Impact Assessment workshop conducted in the Healthy Places Class were included as well.

RESULTS: The Situation at the GSD
Availability
There is a shortage of the bathroom at the GSD according to anecdotal evidence. Several women interviewed for the study, mostly students, reported that there is a severe lack of
women’s bathroom in the GSD. Below is an inventory of the bathrooms that are available on each floor at the GSD:

<table>
<thead>
<tr>
<th>Floor</th>
<th>private bathrooms</th>
<th>Men’s urinal</th>
<th>Men’s toilets</th>
<th>Women’s toilets</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As the table indicates, each floor has around 5 toilets, with men having twice the amount of access to bathroom equipment (toilets and urinals) than women, assuming equal access to unisex bathrooms. Focusing only on the “permanent” users of Gund Hall, i.e. students in studio that have a desk and staff and faculty that have offices, there are about 650 individuals from floors 2 to 5. With only 21 toilets on these floors, this translates to about 31 users per toilet. There are some 400 additional persons in the Masters in Design Studies, Doctor in Design Studies, PhD, and Loeb Fellow programs, not to mention staff in building services, the library, shops, as well as visitors and students from other schools. This large influx of people going through the building presents a huge strain on bathroom facilities. The lack of large bathrooms with multiple stalls – most bathrooms have only one toilet – presents challenges to maintenance, overall bathroom availability, and cleanliness. The participants of the focus groups and interviews, in particular the men, have not reported a shortage of bathrooms. The availability problem appears to run along gender divides. No data comparing staff and student perception of bathroom availability was collected, but looking at the plans, it appears that staff uses the same bathroom facilities as the students.

There have been efforts to improve bathroom availability, the single major capital improvement project this year was the addition and renewal of 5th floor bathrooms. There is a historical reason for the shortage of women’s restrooms. According to Mr. Cahill, Gund Hall’s bathrooms were planned in 1967, drawings finally completed in 1969, and construction completed in 1972. At the time, there were much fewer women in the school and not many facilities were planned. The school’s overall population also expanded rapidly in recent years, quickly outgrowing the original capacity of the building’s restrooms. The building was also not designed to be quickly adaptable, making the issue of bathroom availability a chronic one.

Cleanliness
Negrete (2012) has commented that Gund’s overall cleanliness appears to be excellent thanks to the efforts of the custodial staff. With regards to the bathroom in Gund, this statement could be qualified. During a thorough assessment of all the bathrooms in the building, many were
found to have bits of paper towel and trash on the floor. Overall cleanliness was adequate but definitely not spotless. The focus group seems to reveal a general consensus that the overall cleanliness was adequate. During specific interviews, however, it was revealed that evenings and weekends were times when bathroom cleanliness was problematic. There seems to be a perception that bathroom facilities are not cleaned during these times, which is an issue as the student schedule does not follow the normal working staff schedule. Students, especially those that have studio, are working through the evening and weekends. According to Kevin Cahill, the building manager, the bathrooms are given a daily cleaning Monday through Friday as well as a daily checkup for general maintenance. The lack of cleaning on the weekends is problematic. Urine is known to fluorescence when excited by light in the UV region (Leiner 1987). Thus, a black light was used to detect urine stains invisible to the naked eye. The results were not unexpected: most toilets were free from major spots, with most fluorescence concentrated around the inside rim of toilet seats and the front rim of the toilet bowl (see fig. 1). However, it was interesting to see that many light switch panel plates had strong fluorescence (see fig. 2), indicating some sort fluorescent material. It’s unlikely that such fluorescence comes from urine stains, but this area is a formite (Nagrete 2012) that should be carefully evaluated and cleaned regardless. Many hands will touch the light switch, and because this area is not generally thought to be unclean, it can be more of an issue.

It was previously calculated that there are 31 users per toilet. A more sophisticated calculation can be done, assuming that staff and faculty stay for about 40 hours a week, students stay for about 80 hours per week, and that one uses the bathroom every 4 hours. This amount of “permanent” users translates to about 85 uses per day per toilet. This is an averaged number: if one looks at women versus men, women’s bathrooms would experience higher (>100) number of uses before the daily cleaning. If the bathrooms are not cleaned over the weekend, this could mean some 200 uses of the toilet before the bathrooms are cleaned. However, it does seem like most of the student population are at least tolerant of the current bathroom cleanliness situation.

![Fig. 1. Fluorescent spots on toilet rim](image1) ![Fig. 2. Fluorescent spots on light switch panel](image2)

**Odor**

Odor has come up as an issue for several interview participants. It seems that odor is a significant component to perception of cleanliness, though it does not have an effect on disease
transmission. Some of the unisex bathrooms, in particular, do not seem to be adequately ventilated. In the GUND CITY surveys, many comments focused on ventilation (fig. 6). The room is described as smelling like a “wet dog” and most of the negative comments are focused on ventilation. It seems like people are imploring for improved ventilation. Air fresheners were suggested as a possible intervention on the survey, though the rebuttal response demanded a removal of the odor as opposed to a mere “cover-up” of the smell. It may be more efficacious to install active fans, which are currently not installed, in the bathrooms. It also seems like there are issues with people not flushing the toilets after use. There are also radiators that make the rooms excessively warm. This area probably warrants further research as improper ventilation can have unwanted and more dangerous side effects than lingering odor. There does seem to be significant negative effect on the mental health of the bathroom users, so this may be a priority area for infrastructure improvement.

**Equipment**
The GSD is currently switching to air hand driers to eliminated paper towel use. This has reportedly saved over 5,000 dollars for the school so far. The latest bathroom renovations on the 5th floor feature state of the art hand driers, with the unisex bathroom having a dual use faucet that houses running water and the hand drier. About half of the bathrooms in the GSD, however, do not have air hand driers. Most of the bathrooms on the trays from 2nd - 4th floors and in the basement still use traditional paper towels. In some, paper towel bits are littered on the floor and overflow the trash bins. Huang in 2012 has written that paper towels are actually more sanitary because they remove more germs from hands than air hand dryers. This is an interesting balance of issues between sustainability and sanitation. One individual interviewed mentioned preference of paper towels over hand driers.

No problem has been reported with the sinks or toilets. There was, however, one comment on GUND CITY that asked for a longer faucet. Most unisex bathrooms (fig. 3) have normal trashcans and boxes for feminine hygiene product disposal. There was one report of such a box being missing in one of the female bathrooms. In the survey that was sent out over the GSD listserv, students were asked if they believe the toilets should have a trash bin inside the stall. Half of the students agreed with this, 20 percent didn’t think it was relevant, and 30 percent of the respondents disagreed. According to the building manager, trash bins are readily available and these can be quickly placed in the stalls. While there isn’t an overwhelming demand for trash bins in the stalls, having more trash bins available can be helpful in reducing the amount of paper towels that are often found littered on the floor. It does present an additional task for custodians, and this implementation should be evaluated against the availability of cleaning staff hours. Overall, the bathroom equipment seems to function well and is relatively well maintained.

**Supplies**
In terms of paper towels, toilet paper, toilet seat liners, etc., the bathrooms appear to be well stocked even if the bathrooms are not maintained over the weekend. The focus group and interviewees did not express dissatisfaction with not having enough supplies on hand. Toilet seat liners, however, are not available in all of the restrooms. The tray bathrooms, in particular,
are missing this particular convenience that provides a barrier of protection against unclean toilet seats. In addition, a focus group participant suggested that cleaning supplies be available to the students so that if they wanted to, they can do a quick wipe down of surfaces or sanitize the equipment before use. Having vegetation and vacuum cleaners were suggested by an interview participant as possible strategies to improve the overall sanitation of Gund.

**Hand washing**

Negrete (2012) mentioned that about a third of male students do not appear to wash their hands after going to the bathroom. My own observation has revealed that this is the case. During the bathroom inventory process, one male individual was observed to not have washed their hands before exiting the restroom. In the GUND CITY survey, one male confessed to not washing his hands. Individual interviewees were asked what they thought was the best hand washing procedure. All mentioned soap and water with rubbing the hands together for 20+ seconds as being necessary parts of a proper hand washing procedure. However, they also reported not being able to wash their hands in this manner, usually washing their hands in a smaller time period. Some people also make frequent use of the hand sanitizer, sometimes in place of soap. The issue of hand sanitizer versus water and soap in terms of getting hands clean seems to be debated in popular news media (Doheny 2013). Apparently, hand sanitzers are not as effective in removing some types of germs compared to regular water and soap. Negrete in 2012 also mentioned the lack of hand sanitizers in certain kitchens and restrooms. These appear to have been installed in the year since then, but the number of freestanding hand sanitizer stations does not seem to have increased.

**Education**

There appears to be quite a large amount of literature (fig. 4) posted in the bathrooms instructing people to wash their hands and use proper bathroom etiquette. They are found in all of the bathrooms. No one in the focus group or interviewed expressed the need for more education on sanitation, unlike stress or mental health issues.

**Other Aspects**

In GUND CITY, some comments revealed that the private bathrooms were great as spaces for other private activities such as contemplation. Additional amenities, plants, or improved design
can help promote the feeling of the bathroom as an oasis. The in-class HIA session revealed great potential for design to improve mental health for students. While not directly relevant to hygiene, if the bathrooms appear to be clean with nice materials, soft lighting, plants, and air fresheners, people may be more likely to maintain the cleanliness of the bathrooms by picking up after themselves.

![Fig. 5. Typical hand washing equipment layout](image1)

![Fig. 6. GUND CITY survey posted on bathroom wall](image2)

**Water Fountains**

Water fountains, while not strictly a bathroom feature, are almost always placed next to the bathrooms in Gund. While the presence of water fountains does encourage hydration after using the restroom, if the bathrooms are unsanitary or if users did not wash their hands, the water fountain becomes very susceptible to unsanitary practices. Unclean hands touching the water fountain means the water consumed may be contaminated. However, usage of the fountains appear to be limited, especially on the first floor, where the placement of the fountain directly next to the women’s bathroom door, coupled with its low height, makes it uncomfortable for users. While the lack of hydration may be problematic, this does eliminate the sanitary issue of water fountains.
List potential positive and negative impacts and use the table below to evaluate the severity and distribution of impact.

<table>
<thead>
<tr>
<th>Health Topic or issue (issue)</th>
<th>Positive or negative?</th>
<th>Likelihood of impact?</th>
<th>Differential impacts on groups (e.g., children, elderly, persons with disabilities, persons with lower incomes)</th>
<th>Distribution of impact?</th>
<th>Measurable indicator?</th>
<th>Evidence base for knowing about the issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>cleaning frequency (increase)</td>
<td>+++</td>
<td>P</td>
<td>custodial staff burdens</td>
<td>G</td>
<td>count cleaning frequency</td>
<td>building manager, interviews</td>
</tr>
<tr>
<td>hand sanitizers (increase)</td>
<td>++</td>
<td>P</td>
<td></td>
<td>H</td>
<td>count number of sanitizers</td>
<td>inventory</td>
</tr>
<tr>
<td>bathroom availability (increase)</td>
<td>+++</td>
<td>P</td>
<td>women, who currently have less access</td>
<td>G</td>
<td>count number of toilets</td>
<td>inventory, maps</td>
</tr>
<tr>
<td>bathroom odor (decrease)</td>
<td>+</td>
<td>S</td>
<td></td>
<td>G</td>
<td>code interview responses</td>
<td>interviews, focus group</td>
</tr>
<tr>
<td>bathroom surfaces condition</td>
<td>-</td>
<td>P</td>
<td></td>
<td>G</td>
<td>germs per area</td>
<td>inventory, black light</td>
</tr>
<tr>
<td>hand washing (increase)</td>
<td>+++</td>
<td>P</td>
<td></td>
<td>N</td>
<td>frequency and length, soap use</td>
<td>interview, observation</td>
</tr>
</tbody>
</table>
Identifying Potential Changes to GSD Campus

<table>
<thead>
<tr>
<th>Issue #1</th>
<th>Issue #2</th>
<th>Issues #3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Availability of sanitation equipment</strong></td>
<td><strong>Availability of bathrooms</strong></td>
<td><strong>Perceptions of cleanliness</strong></td>
</tr>
<tr>
<td>Provide toilet seat liners in all bathrooms and sanitizers in more locations around the building</td>
<td>Capital improvement project to increase the number of bathrooms, especially women’s restrooms, in Gund. Perhaps a vertical section of offices may be converted into bathrooms as the school’s population expands.</td>
<td>Improve ventilation in the bathrooms, perhaps with stronger uptake fans.</td>
</tr>
<tr>
<td>Provide basic cleaning supplies in all bathrooms for those who wish to use it</td>
<td></td>
<td>Hire more people to clean bathrooms more frequently, especially on weekends and in the evening.</td>
</tr>
</tbody>
</table>

Identify potential changes to proposal to enhance each of the positive impacts or reduce negatives of issues identified above.
Recommendations
The results of the in-class HIA seem to indicate a greater need to improve social interactions, mental health, and stress reduction / sleep improvement. These seem to be the most important health issues for students. In the overall context of the HIA, bathroom sanitation appears to be adequately addressed presently. However, the situation is not perfect, and with some quite alarming indicators, the school would do well to plan bathroom improvements into future plans.

Short Term
Provide freestanding hand sanitizer stations in classrooms, lecture halls, floor lounges, and printers.
Provide toilet seat liners and basic cleaning supplies in bathrooms.

Medium Term
Increase bathroom cleaning frequency by increasing number of custodial staff.
Perform routine light infrastructure maintenance such as painting walls, replacing missing tiles, covering up exposed ventilation ducts.
Install fans to actively remove odor from the restrooms.
Improve overall design through lighting, plants, etc.

Long Term
Build more bathrooms.
References


Social Connections
By: Ryan Bouma

Overview of Findings
Through an online survey (which included 137 respondents of the nearly 900 GSD students i.e.15%) GSD students demonstrated that roughly 1/3 of the students feel partial or complete disconnection from the GSD community. 53% only felt somewhat connected. As social connections have been linked to enhanced health outcomes (see references in text below), it is in the GSD’ interest to change the physical space of Gund Hall in an effort to better support social interactions and enhance positive social capital.

Background: Why this Topic Matters

This topic is significant because feelings of social connection have been linked to improved health and reductions in psychological distress. As an example, investigations by the University of Minnesota’s Design For Health program state that “research finds that individuals with high levels of social support and those who report living in communities with high levels of social capital rate their health more positively (Poortinga 2006, 265).”\(^1\) In addition, Ellen, Mijanovich and Dillman describe research that shows “some neighborhoods offer more opportunities for social interaction, which has been shown to be a critical determinant of health status (House, Landis, & Umberson, 1988).\(^2\)

According to the GSD student survey, nearly 90% of respondents either somewhat or strongly agreed that they recently felt anxious, nervous or on edge. The same percentage either somewhat or strongly agreed that they felt constantly under strain. Ellen, Mijanovich and Dillman noted that “Stress may exacerbate hypertension and other stress related disorders, and may lead people to engage in smoking and other unhealthy behaviors as strategies of stress reduction. The accumulated effects of stress may also weaken the immune system and increase vulnerability to disease and disability (Geronimus, 1992).”\(^3\)

Augmenting feelings of social connection and opportunities for interaction through changes in the built environment could positively impact health outcomes.

Description: The Situation at the GSD
Based upon an online survey, 53% of the respondents somewhat agreed that they felt connected to the GSD community. Another 15% strongly agreed. The remaining third of respondents either somewhat or strongly disagreed; demonstrating a significant lack in perceived connection.

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\(^3\) Ibid.
Many have pointed to the houses on Kirkland and Sumner Streets as new possibilities for social interaction and collaboration. Unfortunately, survey respondents feel differently. 40% of respondents strongly disagree that the houses are social/collaborative spaces. Another 32% somewhat disagree. For a few, the houses play a role in social interaction but not for the vast majority of GSD students.

In a class interview with Kevin Cahill of Building Services, held November 13, 2013, it was mentioned that the kitchenettes and lounges within the trays were an attempt to provide un-programmed flexible gathering space for students. These spaces appear to be successful based upon the survey as 76% of respondents either strongly or somewhat agree that these spaces are well used.

However, results were roughly split between those who agreed that Gund Hall adequately supported impromptu discussions and meetings and those who disagreed. In addition, 52% strongly agreed that additional convenient collaborative spaces are needed to support social interaction and team productivity. An additional 33% somewhat agreed. This represents a significant desire for additional collaborative space.

The University of Minnesota’s Design for Health found that “Different kinds of environments foster different kinds of social capital. It is not clear which kinds of social capital are best in promoting health. As such it may be important to create a variety of environments so that people can fit their preferences for social connections to environments that support these activities.”4 They were mainly referring to neighborhood-scale physical environments, but perhaps their lesson that one size does not fit all can be applied at the GSD. As the GSD grows, different types of collaborative spaces for social interaction will be needed.

Specific factors should be considered when augmenting the built environment to support social connections. Gary W. Evans, a researcher at Cornell University, reviewed a number of studies linking increased social interaction to improved mental health saying, “Social interaction is...promoted inside buildings by proximity and by creating focal points. Successful focal points include neutral territory, visual prospect (i.e., one can see what is happening in the space prior to making a behavioral commitment to the space), inclusion of activity generators, (e.g., food), and furniture arrangements that encourage social interaction.”5 These findings can inform design responses that seek to augment social interaction.

Evans goes on to articulate another way in which the built environment can reduce psychological distress. “Laboratory and field studies have demonstrated that exposure to natural elements such as trees, water, and natural landscapes replenish cognitive energy. Self-report and cognitive performance data converge on this conclusion. Psychophysiological recovery from experimental and naturalistic stressor exposure is also facilitated by exposure to natural elements. In addition, views of nature and landscape paintings, as well as indoor plants, are all associated with increased positive affect and comfort.”6 These findings reinforce the

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6 Ibid. 545
*biophilia hypothesis* popularized by EO Wilson. Wilson defines biophilia generally as the urge to associate with other forms of life and he believes that this principle, derived from man’s evolution largely outdoors, accounts for the stress relief and recovery response experienced by human beings in the presence of plant life and water. Infusing Gund Hall with views to nature, indoor plants or nature inspired artwork can have a beneficial effect.

The 2012 Healthy Places class found that equipment for indoor social recreation could have a beneficial effect on social capital, stress relief and mental health. Equipment such as pool tables, foosball or shuffleboard was specifically mentioned.

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Diagram 1 Potential enhanced social spaces
List potential positive and negative impacts and use the table below to evaluate the severity and distribution of impact.

<table>
<thead>
<tr>
<th>Health Topic or issue (issue)</th>
<th>Positive or negative?</th>
<th>Likelyhood of impact? Speculative</th>
<th>Differential impacts on groups (e.g. children, elderly, persons with disabilities, persons with lower incomes)</th>
<th>Distribution of impact?</th>
<th>Measurable indicator?</th>
<th>Measurable indicator? Evidence base for knowing about the issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparent lack of convenient space and amenities supporting social interaction.</td>
<td>+++ strongly positive ++</td>
<td>Speculative Probable</td>
<td></td>
<td>G = GSD H = Harvard M = Metro N = National</td>
<td>Y</td>
<td>(amount of space + observation of its use)</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td>See above</td>
</tr>
<tr>
<td>Apparent lack of adequate convenient space for team collaboration</td>
<td>---</td>
<td>P</td>
<td></td>
<td>G</td>
<td>Y</td>
<td>(amount of space + observation of its use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td>See above</td>
</tr>
<tr>
<td>*Apparent lack of indoor recreation amenities for social stress relief</td>
<td>P</td>
<td>Y</td>
<td></td>
<td>G</td>
<td>Y</td>
<td></td>
</tr>
</tbody>
</table>

*Identified by the 2012 Health Places class as issue to address

Identifying Potential Changes to GSD Campus
<table>
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<th>Issues #3</th>
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</thead>
<tbody>
<tr>
<td><strong>Gathering Spaces</strong></td>
<td><strong>Flexible Use</strong></td>
<td><strong>Access to Nature</strong></td>
</tr>
</tbody>
</table>

*Identify potential changes to proposal to enhance each of the positive impacts or reduce negatives of issues identified above.*

- Increase accessible seating and gathering opportunities on the first floor of Gund Hall.
  - This will require coordination with exhibits and care not to constrict pedestrian flows.
- Increase the number of bike racks and disperse them in all corners of the GSD
- Improve the condition of the bus stops, e.g. weather-shelter
Recommendations

Short term
Look for ways to add flexible seating and gathering space in the gallery area on the first floor in the way a Hotel Lobby accommodates a variety of “third place” activities. The area immediately east of the Loeb Library entrance is a candidate location. In addition, the lobby/gallery area between the columns and Western wall of the Chauhaus kitchen is the appropriate dimension for café style seating, allowing the Chauhaus to “spill out” into the gallery without blocking the path of travel. These gathering spaces should introduce indoor plants and vibrant color in accent locations.

Medium term
Expand the successful kitchenette spaces southward. They can double in size with the displacement of only 5 desks each. Additional furnishings can be added, in a conversational pattern, to facilitate social exchange or collaborative work. Also, develop a rotating art exhibit where nature inspired artwork is placed at highly visible impact locations throughout the building.

Long term
Consider more substantive changes to provide flexible spaces such as conversion a portion of the eastern most tray on the second floor. This space, could act as a less congested extension of the Chauhaus, more than doubling the productive socially space. A ramp will be needed from the second floor level to the mezzanine. Reconfiguration of the library is also another option provided the onsite storage of books becomes less necessary. Reconfiguring the library at the lower level offers opportunities for modest indoor recreation space and the equipment identified by the 2012 class.

See diagram 1.0 on the following pages for clarification
References


Social Interaction
By: Derek Galey

Overview of Findings
As both designers and public health researchers are well aware, built spaces have a profound effect on lived experience and a range of health outcomes. The Graduate School of Design is housed in a striking piece of architecture. The design of Gund Hall fosters a unique social experience for students, faculty, staff, and other guests. Many aspects of the building are highly functional, while some alterable design decisions have outlived their usefulness. This assessment employs photographic and qualitative evidence to identify attainable alterations that could improve opportunities for social interaction among users of the space.

Background: Why Social Interaction Matters
There are many reasons why the Graduate School of Design would wish to facilitate social interaction among its students, faculty and staff, as well as the institution’s neighboring communities. Student learning is enhanced by peer-to-peer interactions outside of the structured classroom setting, particularly in a school largely devoted to creative production. Faculty research, too, benefits from sharing ideas. The studio-based learning environment of Gund Hall has increasingly emphasized collaborative work, which requires supportive spaces.

Outside of the core educational mission, creating opportunities for social interaction can improve morale of building occupants. Students who develop dense social networks while studying at the GSD are likely more inclined to donate after graduation, and faculty retention rates may similarly benefit.

Perhaps the most important reason to prioritize social interaction concerns the weight of the evidence linking social support to positive health outcomes. A Design for Health report from 2007 presents findings linking social support at the individual and community levels to subjects’ self-rated health. The same report documents a relationship between social networks and mortality, violence, and physical activity levels. Ellen, Mijanovich, and Dillman suggest that community-level social networks constitute one of the four central pathways through which neighborhoods affect health. (2001) Kawachi and Subramanian connect this literature yet more directly with the facilitation (and inhibition) of social interaction at Gund. The authors write that “social capital can influence health at several different levels of action,” including “schools” and “work places.” (2008, P.15) The GSD has a duty to care for the health of its constituents while they occupy Gund in furtherance of the school’s mission.

Gary Evans conducted an exhaustive review of the literature connecting the built environment to mental health. (2003) His findings stress the importance to mental health and socialization of issues including lighting, crowding, design, personal control, and connection with nature.
Maller, et al. goes into much greater depth on the importance of the last category. (2005)
Description: The Situation at the GSD
Following the existing literature on the opportunities for social interaction in Gund, this study evaluates existing spaces through observation. (Fung 2012) Additionally, photography was used to visually communicate the uses of existing spaces. Sites of observation were chosen based on the results of prior research (Fung 2012), an in-class interview with facilities manager Kevin Cahill, and the experiences and knowledge of the researcher. An anonymous survey of 144 GSD students was conducted, yielding substantial data about health at the GSD, generally, and a number of volunteered and thoughtful open-ended responses about the conduciveness of various spaces in the building to social interaction, in particular. These student observations narrate the visual evidence of the photographs.

The Trays
Student desks occupy the five-story open floorplan body of Gund Hall (collectively termed, “the trays”). Each student who is enrolled in a studio course is issued a desk, and many students spend well over forty hours each week at their assigned desk. On the other hand, students of several tracks (MDes, DDes, and PhD) are not issued desks at all, and many students in the fast-growing Master of Urban Planning program spend their second year desk-less. Nevertheless, this space is a central component of the school’s pedagogy and takes up much of its floor area. Its design greatly impacts the health of many students.

8 As a fourth year student at the GSD, and a former Student Forum Infrastructure Chair, the researcher has personal and professional knowledge of the building and its users’ needs. The researcher has had three different desks within Gund hall’s trays and has also been enrolled for two years at the GSD without desk space.
The balcony-corridor of the fifth level of Gund Hall provides access to student desks. Fluorescent lights hang between steel trusses above.

On each level, certain desks receive natural light during the day from the East-facing stepped glass wall of the building. Others are located under the desks above, in what is termed “the cave.” These desks rely on fluorescent lighting. Evans finds that daylight exposure enhances psychological well-being by reducing hospital recovery times, diminishing distractibility and promoting cooperative social behavior. (2003, P.541)

Although the survey contained no questions referencing lighting, many respondents expressed concern about this arrangement. One survey respondent observed, “The fluorescent lighting in the caves often makes me feel ill.” Another complained of the “horrible amount of harsh electric lightning” [sic]. Another respondent volunteered, “My desk is under the trays and the overhead lights are rough, especially during late nights. Can’t those be turned down?”
The trays underwent a renovation from 2010-2012 during which desks were made smaller so that more could be fit into Gund Hall. During this time, the Student Forum advocated for varied studio spaces, with opportunities for collaboration, but the decision was made to emphasize desk quantity, allowing for program expansion and greater tuition revenue. (Cahill 2013)

Evans presents research findings that the arrangement of furniture can promote social interaction, thereby decreasing isolated, passive behaviors. (2003, P.539) On the other hand, personal control over social interaction is associated with greater comfort. Evans recommends “the provision of a range of social interaction spaces from small intimate spaces for solitude, through small group spaces, to larger, more public interaction opportunities.” (P.544)

A student noted, “I can’t work at Gund too well because it is always so crowded and provides no resilience to noise and loss of privacy. i.e. I cannot control how much undisturbed I want to be.” Another succinctly stated, “the Trays, too many people stressing -> stressful.” Stress, in turn, “may exacerbate hypertension and other stress related disorders, and may lead people to engage in smoking and other unhealthy behaviors as strategies of stress reduction. The accumulated effects of stress may also weaken the immune system and increase vulnerability to disease and disability.” (Ellen, et al. 2001, P.394)

Just as college students with dormitories on long corridors manifest helplessness in comparison to those living in suites, with the intensity of the effect increasing with the duration of the living arrangement (Evans 2003, P.544), the corridor effect created by the alignment of the desks and
the recessed corridor onto which faculty offices open both foster unwanted social interaction and associated negative affect.

Senior faculty offices open onto a narrow, artificially-lit corridor.

Other notable aspects of the trays include a repetitious uniformity of design, the predominance of concrete as a building material, and the absence of either natural elements or views of nature. According to the Harvard Crimson’s 1972 review of Gund Hall, “its resemblance to a factory is unmistakable.” John Andres’ decision to unite the studio work spaces of the school’s various departments “under one roof without division” was partially a reaction to the “secretive nature of the old GSD of individual classrooms” and hidden work spaces.

The pursuit of an open, democratic learning environment is admirable, but—as predicted by the Crimson review—some students have become “homesick for a little visual and acoustical privacy.” Paradoxically, the reliance on the trays as an equalizing work space has undermined the unity of the school’s various programs by relegating desk-less students to a second-class status. Without undermining the GSD’s studio-based pedagogy, better design decisions could reduce stress by making the trays more socially comfortable and conducive to collaborative learning.
Kitchenettes feature a microwave, sink, and, on some levels, a vending machine and small seating area.

**Common Spaces**

Cahill cited the kitchenette areas of the trays as “in-between spaces” for social interaction. Student survey respondents were less enthusiastic, citing insufficient facilities and uncomfortable furnishings. One student described, “If I bring healthy food to eat for lunch, I have to go to the DDeS house to refrigerate it. And then if I use that space I feel unwelcome, and once again uncomfortable for being alone.”

The lounges were widely deplored as “dirty” and “underutilized”—even an embarrassment to invited critics. They also do not serve the needs of students without desks, one of whom wrote that the lounges “are terrible working environments.” But one student offered that a “cosmetic makeover and new furniture for the lounges...could create prime gathering space with incredibly close proximity to the trays where students spend all their time.”

Spruced up for an alumni reception, the pit temporarily served as a space that effectively facilitated social interaction.

“The pit” is another underutilized space at the school, located on the first floor. Although it has great lighting and prime access, it is rarely equipped with furniture sufficient to welcome comfortable social interaction. One survey respondent described the choice of the pit as the
most uncomfortable space in the GSD, “I either feel like I'm invading someone's space, they're invading mine, or if I'm there by myself I'm taking up too much room and will be judged for being alone.”

A recent temporary intervention demonstrated the potential for the space. Provided with comfortable furniture oriented around shared tables, the pit was transformed into an opportunity for social interaction.

**Chauhaus**

It is no secret that eating is a prime opportunity for social interaction. Indeed, the school’s cafeteria, “the Chauhaus,” is at the functional center of GSD life. It is not surprising that students had concerns, including limited selection, truncated hours, and high prices. Two widespread concerns are particularly relevant for social interaction and health, namely, the cafeteria’s uncomfortable seating and crowding problem.

Many students take food back to their desks, eating alone, as the limited seating at the Chauhaus quickly fills on a weekday at lunchtime. The line for food and check out wraps around a salad bar, making navigation difficult and unpleasant. Health research has demonstrated that even “short-term crowding in the laboratory” produces “negative affect as well as physiological stress.” (Evans 2003, P.540)

Students crowd around the cafeteria during lunch time. To-go containers predominate.

Meanwhile, the adjacent outdoor patio is accessible only via a circuitous interior bypass. The unactivated patio often sits empty. A simple direct connection could greatly improve both spaces.
handful of GSD constituents eat outside at lunchtime on a beautiful weekday.
List potential positive and negative impacts and use the table below to evaluate the severity and distribution of impact.

<table>
<thead>
<tr>
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<th>Measurable indicator?</th>
<th>Evidence base for knowing about the issue</th>
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<tbody>
<tr>
<td>Daylighting in the trays</td>
<td>+++</td>
<td>P</td>
<td>Y</td>
<td>G</td>
<td>Y</td>
<td>See above</td>
</tr>
<tr>
<td>Fluorescent lighting in “the cave”</td>
<td>--</td>
<td>P</td>
<td>Y</td>
<td>G</td>
<td>Y</td>
<td>“</td>
</tr>
<tr>
<td>Desk arrangement</td>
<td>-</td>
<td>S</td>
<td>Y</td>
<td>G</td>
<td>Y</td>
<td>“</td>
</tr>
<tr>
<td>Corridor access to faculty offices</td>
<td>-</td>
<td>S</td>
<td>Y</td>
<td>G</td>
<td>Y</td>
<td>“</td>
</tr>
<tr>
<td>Kitchenette facilities</td>
<td>-</td>
<td>S</td>
<td>Y</td>
<td>G</td>
<td>Y</td>
<td>“</td>
</tr>
<tr>
<td>Kitchenette furniture</td>
<td>-</td>
<td>S</td>
<td>Y</td>
<td>G</td>
<td>Y</td>
<td>“</td>
</tr>
<tr>
<td>Lounge furniture</td>
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<td>N</td>
<td>G</td>
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<td>“</td>
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<tr>
<td>Chauhaus furniture</td>
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<td>S</td>
<td>Y</td>
<td>H</td>
<td>Y</td>
<td>“</td>
</tr>
<tr>
<td>Chauhaus crowding</td>
<td>---</td>
<td>P</td>
<td>Y</td>
<td>H</td>
<td>Y</td>
<td>“</td>
</tr>
</tbody>
</table>
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<th>Issue #2</th>
<th>Issues #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Trays</td>
<td>Common Spaces</td>
<td>Chauhaus</td>
</tr>
</tbody>
</table>

Identify potential changes to proposal to enhance each of the positive impacts or reduce negatives of issues identified above.

- User control of light intensity
- Fridge and oven in kitchenette
- Direct connection with adjacent patio
- Collaborative work spaces
- Comfortable furniture
- Comfortable seating
- Presence of natural elements
- Provide work spaces for students without desks
- Longer hours and reduced prices
- Seating space in the lounge/gallery
Recommendations

The Trays

Short term
Deploy plants and other natural elements throughout the trays, paying particular attention to offset the lack of daylight in the “cave” areas.

Medium term
Allow users of the desk space to control the level of fluorescent lighting, offering the potential for savings, improved work environments, and greater personal agency.

Long term
Break up the monotony of the trays by providing spaces for group work. This strategy could make the trays more inclusive: even as the overall number of desks is reduced, more students can be flexibly accommodated.

Common Spaces

Short term
Provide comfortable and socially-oriented furnishings in “the pit” for day-to-day student use. The space can be re-programmed as needed for studio production space.

Medium term
Initiate a “cosmetic makeover” of the lounge spaces, including replacement furniture, up-to-date technology, natural elements, and improved lighting.

Long term
Install common use fridges, ovens, and coffee dispensers in the kitchenettes. Provide more comfortable and appealing furniture.

The Chauhaus

Short term
Extend Chauhaus hours with scaled-back selections at peak times. Increase the variety and reduce the prices of healthy options.

Medium term
Explore opportunities for spill out seating in the lobby or along the mezzanine and second floor balconies to relieve crowding.

Long term
Install a doorway to create a direct connection between the Chauhaus and outdoor patio. This strategy could help activate the GSD’s wood-frame houses by re-centering the campus around...
Gund’s backyard. The Chauhaus could also attract additional Harvard-wide patrons and raise the GSD’s profile.

References


Waste Management
By Eman Lasheen

Overview of Findings
Findings of this HIA indicate that waste management which includes collection and disposal of waste (hazardous and non-hazardous) is a highly organized, well maintained service throughout Gund Hall and has minimal impact on Health of students and staff. Efforts to promote a sustainable waste management practice in Gund hall are available in 3 forms: Waste reduction Campaigns - Single stream Recycling - On Campus Composting. Student Survey indicates that waste reduction campaigns are not effective in their current form and need to be reconsidered and redesigned.

Background
Waste management is a broad term that describes the different processes associated with collection, transport and disposal of waste items. It has evolved and has been reiterated in response to the sustainability movement over time to incorporate source reduction, reuse, recycling, composting and conversion. The US Environmental Protection Agency defines Municipal Solid waste as "trash or garbage" that consists of everyday items we use and then throw away, such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, paint, and batteries. This comes from our homes, schools, hospitals, and businesses "(Municipal Solid Waste, 2011).
ventilation and the level of cleanliness in general. The following diagram maps out these impacts with respect to waste types:

![Diagram showing impacts from waste on health]

Figure 2 Impacts from Waste on Health

Waste generation is directly related to human activities and patterns of consumption. As a design school, The GSD generates waste that varies in type, amount and complexity. Waste in Gund hall can be classified into Solid waste and Chemical ' Hazardous ' waste. 

**Solid waste** is a term that encompasses all sorts of disposable byproducts of consumption. The EPA defines it as "any solid, semi-solid, liquid, or contained gaseous materials discarded from industrial, commercial, mining, or agricultural operations, and from community activities. Solid waste includes the following: (1) garbage; (2) construction debris; (3) commercial refuse; (4) sludge from water supply or waste treatment plants; (5) air pollution control facilities; (6) other discarded materials." (US Environmental Protection Agency, 2011).

The disposal of non-hazardous solid waste takes one of the following streams: Landfill disposal - Composting - Recycling.

**Hazardous waste** is defined as "A waste with properties that make it dangerous, or capable of having a harmful effect on human health and the environment or wastes that meet a particular listing of description or that exhibit a characteristic of hazardous waste" (US Environmental Protection Agency, 2011). They are classified into: listed waste, characteristic wastes, universal wastes, and mixed wastes.

Description: The Situation at the GSD

Gund Hall opened in 1972. It has the capacity to house 500 students and more than 100 faculty and staff (Harvard Graduate school of Design, 2006). Waste generating activities lecture and seminar rooms; workshops and darkrooms; an audiovisual center; computer facilities; a cafeteria; a project room; Piper Auditorium; and the Frances Loeb Library. For the purpose of this HIA, this study will focus on Gund hall and its immediate surroundings. The findings have been formulated from observation, interviews, user survey and mapping.

Observation and Mapping

Waste Collection
Waste is collected daily from Gund Hall at from 3 main destinations, each serving a certain areas of the building to maximize efficiency and ease.

Waste Bin Distribution

Figure 3 Studio Trays
Gund hall meets and exceeds the requirements of its users in terms of providing waste bins. The studio trays which is has the highest user occupancy as a space in the building has 1 10 gallon bin / student. Also, bigger trash bins are located at the top and sides for larger amounts during peak hours and submissions. The big containers are color coded for separation purposes. Compostable waste is placed in yellow, recyclable containers in blue. Grey is generally for paper and other trash, is considered a single stream deposit, and should be separated after collection. Also, Chauhaus has designated labeling to facilitate separation at source.

Processes and Activities
The waste stream at Gund hall is generated due to a variety of activities. The end process depends on the nature of waste (hazardous / non-hazardous)

Non Hazardous Waste
Trash Collection
Through observation of all Gund hall locations, Waste collection is a very well organized process and their seems to be an abundance in waste bins throughout the entire building.

Composting
Gund Hall has the first restaurant on campus to incorporate composting. Single stream recycling introduced as well as compostable utensils, cups and plates.
Recycling
The Graduate School of Design on average recycles 65% of its waste stream including wood scraps from the Woodshop. Recycling has increased roughly 45% since 2004. (Based on data provided by the Harvard recycling office Spring 2012)

Waste Reduction
Chauhaus started a reusable mug program with a first free coffee as an incentive to reduce the use of paper cups.

Hazardous Waste
Hazardous waste is generated in the woodshop and the laser cutters room. It is mostly composed of burnt scraps of acrylic, Plexi and other modeling materials. They are disposed of in closed containers and are collected bi-annually by a specialized collection and disposal service to be disposed of remotely (Chemical Waste Fact sheet, 2012). The practice meets the regulations of the US Department of Energy and Safety. According to the Harvard's Chemical waste fact sheet released in 2012, Common hazardous wastes generated by University operations include:

Waste oils and lubricants generated by a variety of University operations including motor vehicles, elevators, plant maintenance, etc.

Unused chemicals and other hazardous substances, such as pesticides, strong acids & bases, paints, aerosol cans, etc. that are no longer needed, do not meet specifications, are contaminated, have exceeded their storage life, or are otherwise unusable.

Used ethylene glycol and other coolants.

Used solvents from cleaning, painting or other processes.

PCBs, batteries, lead paint and other miscellaneous materials including, contaminated rags and wipes, or broken mercury-containing lamps (i.e. fluorescent lamps).

Contractor hazardous wastes can include any of the above. Harvard University is ultimately responsible for the proper on-site management and off-site disposal of these hazardous wastes.
Also, Hazardous waste containers are subject to the following requirements:

Storage
Containers may only be stored in a designated "satellite" accumulation areas or "main" accumulation areas.

Labeling
Labels must include the following information:
The words "Hazardous Waste."
The waste type in words (i.e. Spent Non-Halogenated Solvents, Waste Oil, etc.).
The associated hazards in words (i.e. ignitable, toxic, etc.).
The date when the container becomes full or otherwise ready for disposal.

Closure
Containers must be closed at all times, unless waste is being added or removed. Open-top funnels may not be left in container opening.

Condition & Compatibility
Containers must be in good condition. There may not be severe rusting, dents, or other conditions which could cause a leak, etc. Containers must be compatible with hazardous wastes stored within them.

Weekly Inspections
Containers must be inspected weekly to ensure that they are properly labeled, in good condition, and meet other criteria

Waste Minimization
Federal law requires generators of hazardous waste to implement measures to limit and reduce the volume and toxicity of hazardous waste. Waste minimization techniques include:
Process/equipment adjustment or modification. Toxic material substitution. Waste segregation and separation.

**Student Survey**
A student survey was conducted for All GSD student groups of all disciplines. The total number of respondents reached 144. The questions were focused on 2 main issues that came across during the observation as potentials for intervention: Waste reduction campaigns and waste bins in toilet booths. Survey results showed that student campaigns like trashless Tuesdays which aimed at raising awareness of the building’s users were not effective. The results indicate that 60% of respondents were not aware of the campaigns which were in the form of stickers around the building. Also, 63% of respondents agreed to the need of adding waste bins inside toilet booths.

![Figure 7 Survey Statistics](image-url)
List potential positive and negative impacts and use the table below to evaluate the severity and distribution of impact.

<table>
<thead>
<tr>
<th>Health Topic or issue (issue)</th>
<th>Positive or negative?</th>
<th>Likelihood of impact?</th>
<th>Differential impacts on groups</th>
<th>Distribution of impact?</th>
<th>Measurable indicator?</th>
<th>Evidence base for knowing about the issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abundance of waste bins throughout Gund hall</td>
<td>++</td>
<td>P</td>
<td>Students &amp; Faculty</td>
<td>G</td>
<td>Bins/Population</td>
<td>Observation</td>
</tr>
<tr>
<td>Abundance in waste bins In studio trays</td>
<td>+++</td>
<td>P</td>
<td>Students</td>
<td>G</td>
<td>Bins/desk</td>
<td>Observation /Interview</td>
</tr>
<tr>
<td>Cleanliness of Waste bins</td>
<td>++</td>
<td>S</td>
<td>Students &amp; Faculty</td>
<td>G</td>
<td>NA</td>
<td>Observation</td>
</tr>
<tr>
<td>Absence of waste bins in toilet booths</td>
<td>+++</td>
<td>P</td>
<td>Students &amp; Faculty</td>
<td>G</td>
<td>N/A</td>
<td>Observation/Survey</td>
</tr>
<tr>
<td>The use of colored bins to classify waste</td>
<td>++</td>
<td>S</td>
<td>Students</td>
<td>G</td>
<td>N/A</td>
<td>Interview</td>
</tr>
<tr>
<td>Waste reduction campaigns</td>
<td>+</td>
<td>S</td>
<td>Students &amp; Faculty</td>
<td>H</td>
<td>N/A</td>
<td>Survey</td>
</tr>
</tbody>
</table>

Identifying Potential Changes to GSD Campus
<table>
<thead>
<tr>
<th>Issue #1</th>
<th>Issue #2</th>
<th>Issues #3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Waste Reduction Campaigns</strong></td>
<td><strong>Toilet Booth Trash Bins</strong></td>
<td><strong>Promoting the Zero Waste Initiative</strong></td>
</tr>
</tbody>
</table>

Identify potential changes to proposal to enhance each of the positive impacts or reduce negatives of issues identified above.

| More focus should be directed towards raising awareness about the importance of lowering consumption and reducing waste generation potentially by incentivizing it as in the Chauhaus mug/free first coffee initiative. | Survey results showed that more than half of the participants agreed to adding a waste bin inside the toilet booth. The sign that says 'please don't throw paper towels in toilet' is quite useless without having a trash bin. | The GSD is part of a wider sustainability initiative promoted by Harvard University but students are not involved with it as in other campuses. Interaction between campuses on waste reduction should be fostered. |
Recommendations

Short term
More reinforcement of cleanliness of waste bins
Addition of Waste bins in toilet booth.

Medium term
Raising Awareness of Gund hall users on waste reduction
Educating students through interaction and active participation by incentivizing waste reduction

Long term
Develop an action network within campus to further promote cooperation on sustainability initiatives targeting waste reduction and recycling like the 'Zero Waste'
Study impacts of other health issues such as sleep deprivation and stress on consumption rates and waste generation to come up with effective waste reduction strategies.

References


Water Fountains
By: Kau‘i Baumhofer

Overview of Findings
Water access does not appear to be a major problem in Gund Hall. There were multiple types of water sources that were conveniently placed for student usage. Students had access to both hot and cold water via the Oasis water machines as well as a fountain for filling bottles on the 5th floor and kitchen faucets with deep sinks that can also be used for filling large bottles. Nearly all of the drinking fountains, water machines, and kitchen faucets were clean and appealing. Water sources were conveniently placed in the middle of each floor and water sources in the kitchenettes were close to student workspaces. However, water access can still be improved.

Background: Why this Topic Matters
Access to high-quality drinking water during work and school hours is essential for health. Inadequate water intake can inhibit learning, memory, and other vital physiologic processes and can also help with weight maintenance when substituted for high calorie beverages (Giles et al., 2012). However, water access is more than just the installation of water distribution equipment such as a bathroom sink or drinking fountain; water access needs to be free, convenient, and appealing (Patel et al., 2012). The purpose of this paper is to evaluate drinking water access in the Graduate School of Design’s Gund Hall.

Prior research literature includes several studies and policy evaluations aimed at increasing water availability and usage to children and adolescents, as well as the results from a water survey done with students from Vassar College (Cradock, Wilking, Olliges, Gortmaker, 2012; Patel, Bogart, Uyeda, Rabin, Schuster, 2010; Souto, 2010). The OSNAP intervention in Boston removed juice from afterschool snack menus and served water as the primary beverage, increasing average water consumption among children in the intervention group by 3.6 servings per day (95%CI: 1.3-5.9) (Giles et al., 2012). Kaushik, Mullee, Bryant, and Hill (2007) implemented an observational study focused on teacher attitude toward water in the classroom, classroom water policies, and consumption in elementary schools finding that schools with “free access” policies regarding classroom water consumption had higher rates of students reaching recommended water intake.

Given the high level of importance of easy access to high-quality drinking water to health and learning, it is essential to have a good understanding of the availability of drinking water in Gund Hall. A drinking water survey at Vassar College reported that students were concerned about the cleanliness, low flow, and poor taste of some of the drinking fountains available to them (Suoto, 2010). This paper will present a survey of the drinking fountains, kitchen sinks, and water machines available in Gund Hall. Next the convenience, appeal, and usage of the drinking water sources in Gund Hall will be presented. Finally, recommendations on how to improve drinking water access and utilization will be offered.
Description: The Situation at the GSD
Initially, an audit of water access adapted from a Harvard School of Public Health water access audit tool was taken in Gund Hall (Prevention Research Center, 2013). Table 1 shows the results of this audit and indicates that every floor in Gund Hall had at least one source of drinking water (aside from a bathroom faucet) except for the basement. In the basement, there was no source of drinking water located. However, staff offices occupy much of the basement and staff areas were not included in this audit. Drinking fountains were located between the men and women’s restrooms on floors 1 through 5 of the building. On floors 2 through 4, Oasis-brand hot and cold water dispensing machines and kitchen facets were available in the kitchenettes near the student studios. Water is also available in the Chauhaus from a hot water dispenser by the coffee or from the fountain machine. Figure 1 in the appendix shows a map of the drinking water sources in proximity to the studio spaces, classrooms, and offices.

While a physical survey most likely gave an accurate count of drinking water sources in Gund Hall, there are still limitations to this method. There may have been other water machines or kitchen faucets that were within faculty offices or staff spaces that a student outside the GSD would not have access to or knowledge of. Students who are also school employees or research assistants may also have a scope of access. Also, restroom faucets were not included in this census as they may not be considered desirable sources of drinking water.

<table>
<thead>
<tr>
<th>Floor</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None found in library or basement work space</td>
</tr>
<tr>
<td>1</td>
<td>Between men and women’s restrooms</td>
</tr>
</tbody>
</table>
| 2     | Water cooler in Rm204 (faculty resource room) 
Between men and women’s restrooms 
Oasis hot/cold machine in the kitchen by the studios 
Kitchen sink in the kitchen by the studios |
| 3     | Between men and women’s restrooms 
Oasis hot/cold machine in the kitchen by the studios 
Kitchen sink in the kitchen by the studios |
| 4     | Between men and women’s restrooms 
Oasis hot/cold machine in the kitchen by the studios 
Kitchen sink in the kitchen by the studios |
| 5     | Two fountains between the men and women’s rest rooms |

Table 1. Locations of drinking water sources in Gund Hall

Next, each water fountain was observed for 30 minutes to assess usage. Table 2 shows the results of the observations. Floors 1 and 2 were observed in the morning and it was hypothesized that the fountain on the first floor would receive a significant amount of usage since it is close to the entrance of the building and is in a high traffic area. However, only one person was observed using the fountain on the first floor and no observations were made at the fountain on the second floor. Low usage of these fountains may have due to the day of the week or the time of day. Usage may have been higher in the afternoon or in the evening. Floors 3 through 5 were observed later the same afternoon. These fountains had higher usage during
the observations times, possibly due to higher occupancy of the floors by students working in the afternoon compared to the morning observation times.

This method also had significant limitations. First, each fountain was only observed for 30 minutes. Finding an inconspicuous location to observe the fountain for 30 minutes was difficult. The water machines and kitchen faucets in the kitchenettes were not observed due to this difficulty. There was also no way of ascertaining whether students were obtaining water from other sources such as home, restroom faucets, other buildings throughout the university, or other, unknown sources.

<table>
<thead>
<tr>
<th>Floor</th>
<th>Date</th>
<th>Time</th>
<th>Usages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11/13/13</td>
<td>9:00-9:30am</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>11/13/13</td>
<td>9:30-10:00am</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>11/13/13</td>
<td>1:00-1:30pm</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>11/13/13</td>
<td>1:30-2:00pm</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>11/13/13</td>
<td>12:30-1:00pm</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2. Water fountain usage by floor

<table>
<thead>
<tr>
<th>Floor</th>
<th>Fountain</th>
<th>Flow rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>65 gal/min</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>41 gal/min</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>50 gal/min</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>31 gal/min</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>64 gal/min</td>
</tr>
<tr>
<td>2</td>
<td>54 gal/min</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Flow rate per drinking fountain

Lastly, water flow rate of each of the faucets was tested by recording the time necessary for an 8-ounce measuring cup to be filled. This measurement was taken three times for each faucet and then averaged, following the water audit tool from the Harvard School of Public Health’s Prevention Research Center (2013). Table 3 shows the results from this exercise. As these data show, most of the drinking fountains tested had reasonably close flow rates (note: this is not a measure of water pressure) except the fountain on the 4th floor. However, while these flow rates are adequate for drinking, it takes a long time to fill up the type of water bottle that students often carry.
Map of drinking water sources in Gund Hall

SYMBOL KEY:

- water fountain
- water machine
- kitchen sink
SYMBOL KEY:

- water fountain
- water machine
- kitchen sink
SYMBOL KEY:

- water fountain
- water machine
- kitchen sink
SYMBOL KEY:

- water fountain
- water machine
- kitchen sink
SYMBOL KEY:

- water fountain
- water machine
- kitchen sink
SYMBOL KEY:

- water fountain
- water machine
- kitchen sink
List potential positive and negative impacts and use the table below to evaluate the severity and distribution of impact.

<table>
<thead>
<tr>
<th>Health Topic or issue (issue)</th>
<th>Positive or negative?</th>
<th>Likelihood of impact?</th>
<th>Differential impacts on groups (e.g. children, elderly, persons with disabilities, persons with lower incomes)</th>
<th>Distribution of impact?</th>
<th>Measurable indicator?</th>
<th>Evidence base for knowing about the issue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+++ strongly positive</td>
<td>Speculative</td>
<td>G = GSD  H = Harvard  M = Metro  N = National</td>
<td>GSD</td>
<td>Yes</td>
<td>Water audit</td>
</tr>
<tr>
<td></td>
<td>++ moderately positive</td>
<td>Probable</td>
<td>Degree programs with more work time spent in basement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ mildly positive</td>
<td></td>
<td>Degree programs with more work time spent in library</td>
<td>Harvard</td>
<td>Yes</td>
<td>Water audit</td>
</tr>
<tr>
<td></td>
<td>neutral</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- mildly negative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-- moderately negative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>--- strongly negative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>U uncertain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No water in basement

---

No water in library

---

One fountain on 1F

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Water dispenser in Chauhaus

---

2F Fountain, water machine, faucet

---

3F Fountain, water machine, faucet

---

4F Fountain, water machine, faucet

---

5F Fountain and bottle dispenser

---

Identifying Potential Changes to GSD Campus
<table>
<thead>
<tr>
<th>Issue #1</th>
<th>Issue #2</th>
<th>Issues #3</th>
<th>Issues #4</th>
<th>Issues #5</th>
<th>Issues #6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water access in Chauhaus</td>
<td>Fountain, dispenser, and faucet on 2nd-4th floors</td>
<td>Fountain and bottle dispenser on 5th floor</td>
<td>Increased water access in basement</td>
<td>Increased water access in library</td>
<td>Increased water access on 1st floor</td>
</tr>
</tbody>
</table>

Identify potential changes to proposal to enhance each of the positive impacts or reduce negatives of issues identified above.

<table>
<thead>
<tr>
<th>Place water dispensers in Chauhaus in an uncongested area</th>
<th>Regular maintenance and monitoring of temperature and water flow</th>
<th>Regular maintenance and monitoring of temperature and water flow</th>
<th>Add bottle dispenser in basement workspace</th>
<th>Add bottle dispenser in basement</th>
<th>Add bottle dispenser to lobby area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular cleaning for sanitation</td>
<td>Regular cleaning for sanitation</td>
<td>Add fountain in basement workspace</td>
<td>Add water dispensing machine in basement</td>
<td>Add bottle dispenser to Room 110</td>
<td>Add filtered fountain in basement bathroom</td>
</tr>
</tbody>
</table>
Recommendations

Short term
Improve drainage of 4th floor drinking fountain
During the flow rate tests the drain of the drinking fountain on the 4th floor was very slow. This may make using the fountain unappealing and could contribute to the growth of bacteria. A recent report from Kimberly-Clark (2012) indicated that 75% of break room faucet handles and 23% of water fountain buttons tested had high levels of bacteria, defined as an ATP count of 300 or higher (a measure of bacterial activity).

Medium term
Provide drinking water access in the basement workspace and the library;
Rearrange water dispensers in Chauhaus to relieve congestion during meals.
The water audit revealed that there was no access to drinking water in the basement workshop areas and in the library. This is detrimental to students’ hydration while studying or working. Using the bathroom faucet may not be appealing for students and leaving computers and bags unattended to obtain water from the first floor may pose a security risk. A water dispensing machine similar to the ones located on the 2nd through 4th floors may attenuate some of the concern of water damage to books or workshop equipment. Personal communications with students have revealed a desire for more water on the 1st floor. The drinking fountain between the restrooms is too slow to fill a water bottle quickly and the area around the dispensers in the Chauhaus are too congested to use during meal times unless one is also entering the area to purchase food. Moving the water dispensers to the area near the cutlery may relieve some of this congestion. Cups should also be moved to a less congested area for those students who do not have their own cups or bottles.

Long term
Increase drinking water access on the 1st floor in room 110;
upgrade some fountains to bottle dispensers similar to the one located on the 5th floor
Considering the high volume of traffic on the 1st floor, increased water access would be beneficial. A good option may be the installation of a water dispenser as part of improvements to Room 110, which are referenced elsewhere in this HIA. The fountains on the 2nd through 4th floors would benefit from upgrade to the double fountain/dispenser style already installed on the 5th floor to accommodate students who need rapid-filling for bottles and others who do not have a bottle or cup on hand.

Overall, drinking water access in Gund Hall is good and appears to be convenient and appealing enough for students to use the available resources. An additional layer to improve student water consumption may be to use the lobby of Gund Hall to feature a water consumption campaign. Health messages about the importance of adequate water consumption could surround a pictographic history of water dispensation. This assessment, however, only gives a small picture of the state of water access and consumption in Gund Hall. While this assessment only focused on access to drinking water, interviews with students or focus groups allow a greater understanding of water consumption patterns.
References


Consolidated References


2012 HIA of Gund and GSD Campus, and references therein 4: 545.


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47(3), 247–266. doi:10.1353/csd.2006.003


Laura Snowdon


http://www.hupd.harvard.edu/public_log.php


Student activity group leaders survey Student survey.

Student focus group.


Ying Xu, Suresh Raja, Andrea R. Ferro, Peter A. Jaques, Philip K. Hopke, Cheryl Gressani, Larry E.