Library Space Utilization Study:
First Year in the New Building
Final Report

July 2014
Introduction

During the 2013-14 academic year, the Library undertook a library space utilization study to assess how patrons used particular public spaces in the new library building during its first year of operation. This report will outline the study’s data gathering methodology and data sources before presenting a summary of key findings and recommendations.

Study Focus
It may be useful to describe the parameters of the Library Space Utilization Study. This project focused on patron use and perceptions of public spaces in the new library building—which spaces are used and what activities patrons engage in while occupying those spaces.

Related Issues
This study does not cover two separate but related issues:

1. Use and perceptions of non-public spaces in the new building. This report focuses on patron (faculty, student, visitors) use and perceptions about the publicly accessible spaces in the new library building—that is, those spaces specifically designed for patron access and use. Not addressed in this survey, but of important value in considering longer term space management, is library staff use and perceptions about the building as a functional workspace—that is, restricted staff office and work processing areas. Challenges such as lack of adequate storage spaces of various kinds (collection related and non-collection related storage) and difficulties in finding meeting spaces during periods of heavy use (lack of designated library staff meeting rooms) remain issues for library staff. Ideally, another study would examine library space from an operational perspective.

2. Library hours in detail. Though some basic library hours data is cited in the Library Space Utilization Study to indicate broad patterns of use by time, day, and month, this study does not explore hours in detail. A separate Library Hours Study was conducted during the AY 2013-14, which gathered data that can be used to inform decision-making about library hours—and the resources needed to support them—going forward. Using a variety of quantitative and qualitative data gathering methodologies, the Library collected data to assess library hours in relation to demonstrable use data, patron needs and perceptions about hours, research library hours norms, and current resource limitations. Please see that study for a detailed examination of library hours.
Methodology and Data Sources

Throughout the 2013-14 academic year, the library used a variety of data gathering methodologies and tools to collect quantitative and qualitative data about the way patrons use space in the new building. At the end of the academic year, the Library collated and analyzed the data to identify how the results can be used concretely to improve decisions, policies, and plans about library space. Data analyzed included:

- **Quantitative**
  - Observational data using the SUMA\(^1\) iPad app (random sampling, three times a day)
  - Gate counts/people counter at library lobby entrance
  - Door swipe counts for secured areas: Faculty Room, Ph.D. Suite
  - Room reservations counts: reserved meeting rooms and classroom spaces
  - Computing spaces data

- **Qualitative**
  - “Library as Place” question from the 2013 Annual Library Survey of Students and Faculty
  - Focus group feedback
  - Online feedback via web form and social media outlets

The study encountered several data challenges during the year:

1. Perhaps most impactful is the weakness of the current 3M gate counter in providing accurate patron counts. The 3M gate counter has proven to be repeatedly inaccurate in its counts and incapable of providing real-time, hourly counts for better analysis. A formal proposal suggesting that the Library explore more accurate and widespread patron sensor technology throughout the building was offered to the James Lenox Librarian in June 2014 (Appendix A).

2. A second challenge was the absence of any other real-time patron data collectors at any other space in the building beyond the lobby entrance gate. The randomized observational study was undertaken to fill in this data gap, but future analysis would be greatly strengthened by the addition of sensors in key spaces in the building to more accurately track use.

3. A third challenge was that Library solicitation for patron feedback on library space via social media was not as engaging as originally hoped. For example, a patron photo elicitation project that has been successful by other libraries did not generate much activity. Thus, the majority of the qualitative data was garnered through the annual library survey and focus group discussion.

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\(^2\) In library restructuring, the Media Lab has been revised and renamed the Digital Scholarship Center as it moves to its permanent home in the North Wing in August 2014.
The appendices provide a series data summaries for a fuller, detailed picture of each data gathering methodologies’ results. All are worth review for a fuller picture of the library building during its first year of operation.

Appendix A: Library Patron Sensors – An Exploratory Study June 2014
Appendix B: Annual Library Survey of Students and Faculty
Appendix C: Observational Random Sampling (SUMA) Summary
Appendix D: Gate Count Data Summary
Appendix E: Door Swipe Data Summary
Appendix F: Room Reservation Data Summary
Key Findings

• The major overall finding is that the new library building has been extremely well received and is heavily used by the PTS community and visitors for a variety of research, study, collaborative, technological, class, and social activities.

• Steady growth in use from the Fall 2013 to the Spring 2014 semester is indicated by gate count, swipe card, and observational data.

• The four most popular and frequently used spaces in the building are the Reference Reading Room, South Gallery (second floor), Concourse (first floor open seating), and the Café.

• South Gallery use numbers and patron feedback data points all confirm the wisdom of transforming that area to open public seating.

• The five most common patron activities in the new building are reading/studying, using installed technologies, class, collaborating (informal meetings), and meetings (formal).

• "Impromptu use" is a (welcome) norm, alongside advance room reservation, and indicates maximized space use. Room reservations, even for formal meeting spaces like the Meeting Room and Theron Room, do not provide an accurate picture of actual use. Even dark, unreserved rooms which appear empty are very often are occupied by students studying, watching media on their laptops or iPads, and/or sleeping.

• Solitary quiet space continues to be at a premium. Solo students can very often be found occupying group meeting spaces like the multipurpose, seminar, and small group study rooms, as well as larger rooms like Meeting and Theron Rooms when those rooms are not otherwise in use.

• Patrons value the balance between technology-free and technology-rich spaces (rooms and carrels), particularly noted by students.

• The Café was enthusiastically used by patrons as a social space, small group and individual study space, and meeting space. It was not uncommon for the café to be fully or nearly fully occupied during the lunch hour and mid-afternoon (peak library use) hours during the semesters. The Summer 2014 cafe renovation to improve cafe aesthetics and expand food/drink offerings suggests that the popularity of this space will continue to grow, even as the Seminary introduces additional informal social spaces, such as the Pub.
Issues to Consider, Clarify, or Improve

• **Improved signage, wall maps, and area/section designators** requests were frequently received by library staff from students and visitors. Perhaps with the completion of the North Wing and library offices moving into their permanent homes in August 2014, expanded signage can be considered.

• **Faculty Room (3095).** Perhaps one of the most disappointing data points is evidence that the third floor Faculty Room has not been widely embraced by the faculty. Only 13 of 39 faculty members (33.3%) have even been in the Faculty Room; of those 13 faculty patrons, the majority entered the room less than five times throughout the AY 2013-14. Three faculty “super users” combined account for 92.9% of total visits to the Faculty Room.

• **Purpose of Scholar Commons (3028).** Some confusion exists amongst students and faculty about the use and accessibility of the third floor Scholar Commons. Some are not sure if they are welcome to use the space, perhaps due to the location of the entrance doors inside another set of exterior doors.

• **Affiliated Users and External Groups** are often seen in the library, using the building and rooms in ways more analogous to a public library—possibly a positive value in terms of community relations, but potentially challenging as PTS students look for open seats and rooms to do their research and PTS staff attempt to maintain complex technologies within rooms. For example, adult tutors and their junior/high school age tutees are often occupying the Concourse or a multipurpose room. Similarly, groups of Princeton University students (affiliated users) often occupy small group spaces. One regular group of university math students could often be found in the afternoon in the Meeting Room (1010), using the presenter station and Smartboard. Impacts on technology maintenance when in-room technologies are frequently used by untrained, unaffiliated users is another issue to consider.

• **Use of the Atrium** for social events generated repeated noise complaints from students and faculty throughout the year, with many faculty and students raising questions about why such events are occurring in a research library.

• **Specific smaller critiques** of the new building (data sources noted).
  o Air circulating vents in the seminar rooms are very loud and often disruptive to classes and meetings scheduled in these rooms (Annual Survey; multiple comments to library director);
  o Book scanner stations in the Copy Room and Third Floor are extremely popular, and students state they “need more” of these throughout the building (Annual Survey; multiple comments to library staff).
Recommendations

• **Develop a practical approach** to addressing the “Issues to Consider, Clarify, or Improve” identified by our patrons.

• **Plan for “regular” and “special focus” future library space assessment.**
  o “Regular” library space feedback mechanisms. These would include feedback points about library space from our patrons, incorporated in mechanisms/instruments already in place.
    ▪ Include at least one library space question in Annual Survey.
    ▪ Include at least one library space discussion topic in Annual Focus Groups.
    ▪ “Library as Place” question set from ARL’s LibQUAL+ survey also provides more extensive detail on a three-year cycle.
  o “Special focus” library space assessment projects. These would be wider scale special projects initiated for a particular purpose.
    ▪ It is recommended that the library undertake a second library space assessment project in the academic year 2015-2016. With the opening of the North Wing in August 2014, this timeframe would provide one+ year for the library offices to be operational in their permanent homes, Information Technology offices and service points to be moved into the Library building, and another full academic year of PTS classes and events to occur in library space.
    ▪ In the next space study, consider taking either a “macro” or “micro” view of library space for detailed assessment.
      Examples:
      • Macro: Future library space assessment may benefit from a wider campus approach (should one be developed) that analyzes student study, research, collaboration, and social spaces campus-wide. Several recent studies in the library professional literature suggest the value of this wider lens approach.  
      • Micro: Focus on key library spaces to explore in-depth how those spaces facilitate student learning and support faculty productivity. For example, the University of Tennessee and others have undertaken projects assessing their information commons spaces and services in relation to student success.

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Appendix A

Library Patron Sensors: A Preliminary Exploration
June 2014

History and Rationale:
Since the opening of the new library building in May 2013, there has been increased interest in library patron data—both the number of patrons that come into the building and how patrons move around various spaces once they are inside the building. At present, the only “patron counting” mechanism in the building is the 3M counter installed at the security gate, just inside the lobby. This has led to several challenges:

• The 3M counter performance has been unreliable and problematic in its data collection;
• The 3M counter is an older style model which requires daily manual resetting and does not allow for automated data collection and analysis;
• The front gate is the only place in the building with patron count data, though regular requests for patron count and patron movement data has been received over the last year for a variety of spaces in the new building, including the café, South Gallery, Concourse, Atrium, etc. There is currently no device in place that monitors patrons in these areas. There is only (unreliable) front gate count data available.

In short, these two reasons motivated the library to conduct preliminary research into the patron counter market:

1. Most importantly, the Library needs to automate (at minimum) entry/exit gate count data gathering to both ensure that it is capturing accurate data and to free up staff time from the tedious work of data gathering and daily physical device resetting at what will be two entry/exit gates, one of which may not be staffed;

2. The Library needs to be able to gather and analyze patron data information about other identified spaces in the building to continue to be responsive to patron use patterns and to provide information as requested to other entities about library space use. We anticipate the need for this data will only increase in the coming years because the new library building will continue to be a focus of attention with the renovation of the café and the completion of the North Wing.

Desired Functionality:

• Can provide accurate entry/exit data at front gate;
• Can handle the addition of a second, new "back entrance" with front gate data;
• Can provide online access to an interface that shows real-time (or at least hourly) automated data collection and a variety of use reports;
• Is cost-effective enough that the library could purchase many sensor points for important areas of the library it wants to track;
• Can possibly be "moved" with regularity, if the library wants to focus on a
particular area of the building during a particular time period (but may not need constant counting of that space);

- Ideally is wireless, as it is unlikely now that we are at the end of construction that additional extensive wiring will be possible.

Why can’t our current security gate vendor 3M provide this functionality?
We explored 3M first. 3M has confirmed the desired functionality is only available on 3M’s RFID systems, a technology the library does not employ.

Suggestions for Moving Forward:

1. Determine if this is something the Library wants to pursue through discussions with the Corporation Yard Group, Construction Team (Finance, Security, architects, etc.).
2. Visit with Princeton University Frist Center Manager to see one example of a system in action.
3. Issue an RFP to the vendors on the attached Excel spreadsheet.
   a. After speaking with several vendors, their unanimous opinion was that the library is probably looking for a package system:
      i. Two overhead thermal sensors (hardwired) at front and back entry/exit points. These fixed systems are highly accurate (95%) and of the latest technology that can easily track multi-directional movement—for example, if a group of three people enter at the same time, it sees all three.
      ii. Three to ten wireless mobile infrared sensors that can move around the building, depending on which spaces the library is interested in tracking. These sensors work off of the “broken beam” technology, which is slightly less accurate than thermal sensors in terms of multi-directional movement. Still, they are the most popular and widely used type of sensor due to the more modest price point.
      iii. An integrated and automated data collection and reporting interface.
Appendix B

Annual Library Student and Faculty Survey

Question 15: Which Physical Spaces in the New Building Have Been Most Conducive to Your Research and/or Teaching?

Faculty Response
11 of 39 (28.2%) total faculty responded to this question on the survey. It is perhaps logical that the smart classrooms/seminar rooms are the physical spaces that received the most positive response from faculty. More positive comments were received on general physical elements of the building include relatively equal mentions of furniture, open reading areas, the Café, and personal reading spaces.

The only negative critique received from faculty in the survey was a comment noting that the air circulating vents in the seminar rooms are very loud and often disruptive to classes and meetings scheduled in these rooms.

Student Response
76 of 502 (15.1%) total students responded to this question on the survey. Of particular note in these responses is the affirmation of the most popular used spaces as revealed in the Observational Random Sampling Survey data.
Further, in the open text field, many students submitted positive comments about general features of the new building—particularly and frequently mentioning the value of quiet spaces, the large tables, the open quality of the building, the windows and light, the seating facing Mercer Street on the second and third floors, and the ideal of balancing work carrels options both with and without computers.

The only explicit negative critique received from students in the survey was a comment that students “need more” of the extremely popular book scanner stations (currently in the Copy Room and Third Floor) throughout the building.
Appendix C

Observational Random Sampling (SUMA) Summary

Full building observation data by space and patron activity was collected three times a day (twice on weekends) from September 1, 2013 through June 30, 2014 using an open source iPad app developed by North Carolina State University Library when that library was assessing use of its own new building. The SUMA app was very efficient and effective in providing insight into which spaces of the building patrons gravitated to and what activities they engaged in while in those spaces. In lieu of space specific patron counters in various spaces beyond the Library’s front gate, this kind of observational random sampling over a year’s time gives unique insight into building use patterns.

Patron Activities in the New Building

Observed patron activities range widely, and the building can truly claim to house a variety of individual study/reading/reflecting activities, small and large group collaborations, informal and formal meetings, and event and display engagements. The chart below notes the most popular patron activities—what our patrons do in the new building, how they use the space.

Most Popular Spaces in the New Building

Observed patron data clearly shows the popularity of the Reference Reading Room, South Gallery, First Floor General Seating (Concourse), and the Café.
Building Use By Month and Time of Day

Monthly use patterns follow regular patterns of increased use around Reading Weeks and Exam Weeks at the middle and end of each semester.

Time use patterns clearly show the popularity of the library in the afternoons during the week, with relatively modest evening and weekend building use. (Note that a separate Library Hours Study was also conducted during the AY 2013-14; please see that study for a detailed examination of library use patterns by time and day).
Appendix D

Gate Count Data Summary
Library entrance gate data, providing approximate “patron counts” by day

While noting the issues about the 3M Gate Count system mentioned in the front of this report, the current Gate Count does provide a very general snapshot of how many people entered the library building by date, week, and month.

September 1, 2013 to June 30, 2014
Total patron count: 285,762 visits
Average weekly patron count: 3,664 visits
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<th>Value</th>
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<td>Oct 27 - Nov 2, 2013</td>
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<td>June 29-July 5, 2014</td>
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Appendix E

Door Swipe Data Summary
“Swipe card” data on key secured areas of the building: Ph.D. Suite and Faculty Room

Similar to gate count data, card swipe data presents only one snapshot of space use that must be analyzed in context. Card swipes for this summary are described as discrete “visits” because there is no way to distinguish a unique visit from a student accessing the room several times during one conceptual “visit.”

Faculty Room
While not fully reflective of total faculty use of the entire building, the data on faculty use of the third floor Faculty Room demonstrates that the room has not been widely embraced by the faculty. According to door swipe card data, only 13 of the 39 faculty members (33.3%) have been in the Faculty Room; of those 13 faculty patrons, the majority have entered the room less than five times throughout the AY 2013-14.

Three faculty “super users” combined account for 92.9% of total visits to the Faculty Room.

<table>
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<th>Faculty</th>
<th>Visits</th>
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<td>Faculty D</td>
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<td>Faculty F</td>
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<tr>
<td>Faculty I</td>
<td>9</td>
</tr>
<tr>
<td>Faculty C</td>
<td>7</td>
</tr>
<tr>
<td>Faculty A</td>
<td>4</td>
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<tr>
<td>Faculty M</td>
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<td>Faculty B</td>
<td>3</td>
</tr>
<tr>
<td>Faculty E</td>
<td>3</td>
</tr>
<tr>
<td>Faculty G</td>
<td>3</td>
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<tr>
<td>Faculty L</td>
<td>2</td>
</tr>
<tr>
<td>Faculty J</td>
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</tr>
<tr>
<td>Faculty K</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>521</strong></td>
</tr>
</tbody>
</table>

Ph.D. Suite
In contrast, the Ph.D. Suite has been strongly embraced by students. Ph.D. Card swipe data for the Ph.D. Suite entry doors reveals that this room is heavily used throughout most of the Library’s operating hours, from early morning to late evening.

In the Fall 2013 semester, there were 4,630 card swipes to the Ph.D. Suite, made by 71 unique Ph.D. students. Of these, 19 Ph.D. students were “super users” logging over 100 visits each during the semester, with the most frequent visiting student logging 332 visits over the semester. 15 students visited the suite less than five times. The range of 332 visits to 1 visit creates an average total number of visits of 65.2 by students using
the room this semester.

In the Spring 2014 semester, there were 7,659 total card swipes to the Ph.D. Suite, made by 65 different students. Of these, 26 Ph.D. students logged over 100 visits during the semester, with the most frequent visiting student logging 644 card swipes. 9 students visited the suite less than five times. The range of 644 (high) to 1 (low) during creates an average number of visits of 117.8 by students using the room this semester.
Appendix F

Room Reservation Data Summary
Official room reservations made via the PTS Master Calendar for publicly available library spaces for meetings, events, outside events

Thirteen rooms (13) in the new building are available in the Master Calendar for scheduling by the PTS campus community and by reservation to outside groups through Conference Coordinator Amy Ehlin and the Housing Office.

It is important to note that this data reveals only formal, scheduled events via the Master Calendar and thus do not present a full picture of total room use. This data should be considered in context with observational and survey data about room use.

Scheduled PTS Classes
The Master Calendar shows 27 courses were assigned classroom space in the Library during Fall 2013. During the Spring 2014 semester, 24 courses met in the Library. The Seminar Rooms on the first and second floor were the most popular spaces for scheduled classes. The most popular schedule course times were 8:30/8:45 a.m. and 2:00 p.m.

Scheduled Events and Meetings in Library Space (excluding classes)
A total of 577 meetings and events (lectures, films, receptions, webinars, and others) were scheduled in the library building during its first year of use, hosted by a wide range of campus departments, offices, and groups, including outside (unaffiliated) groups, individual, and social event organizers who have made special arrangements to use the space.4

Perhaps not surprisingly, the Meeting Room (31%) and Theron Room (25%) account for well over half of all reservations. The second floor Alumni Room, the seminar rooms on all of the floors, as well as the two multipurpose rooms on the third floor, are also popular locations for scheduled meetings and events.

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4 Master Calendar reservations for room repairs, room setup, room testing, vendor work, and tech reviews have been removed from the full listing to provide an accurate view of patron use of rooms.