

Using data to map & move mountains (of books and more).

Developing visualizations to right-size and locate collections



PURPOSE AND GOALS

Hillman Library, built in 1967, serves as the main library for the University Library System (ULS), and like many other libraries of its era, it prioritized the safe storage of books over reader comfort. In 2016, the ULS was given the opportunity to re-imagine the spaces and services in Hillman Library which at that time housed nearly 100K LF of collections. Goals for the renovated library were to:

- Provide more spaces and services for creativity, collaboration, active learning and showcase community achievements
- Increase footprint for user services and decrease footprint of physical collections to house primarily unique, high-demand, and topical collections.
- Move 80% of the collection to off-site high-density storage facility, while keeping items accessible on request.

The renovation was slated to proceed in stages, with the library remaining open throughout the work. This meant that collections had to be moved to and from swing spaces, while also selecting and pulling items to be sent to remote storage and keeping the collection accessible to our users. To achieve this, we needed to:

- Model future collection scenarios and test different ‘send to storage’ selection criteria
- Generate lists of items to be sent to storage
- Assist patrons in locating items in swing spaces and new locations
- Right-size collections in the renovated space while accounting for future growth and space needs

METHODS

Collection modelling was used to plan what to move where and when, and to make predictions for future growth and perform collection maintenance once items were moved to their permanent location. Collection mapping was used to plan shelf distribution of remaining material in Hillman in its permanent location. We also developed interactive map visualizations to help users locate items as collections were on the move.

Collection Modelling

- Data from LMS was used as basis for visualizations in Tableau
 - Apply different selection criteria to see impact on collection Filters for publication date, number of loans, date of last loan, LC class, etc. Criteria could be applied individually or in Boolean combinations (e.g., items published after 2014 OR >2 loans AND last loan date >2016)
 - Calculate linear footage
 - Project growth in LC classes based on recent acquisitions data
 - Estimate amount of material to be sent to Storage to assist logistics planning
 - Export ‘pull for storage’ lists with selected criteria (filters) applied

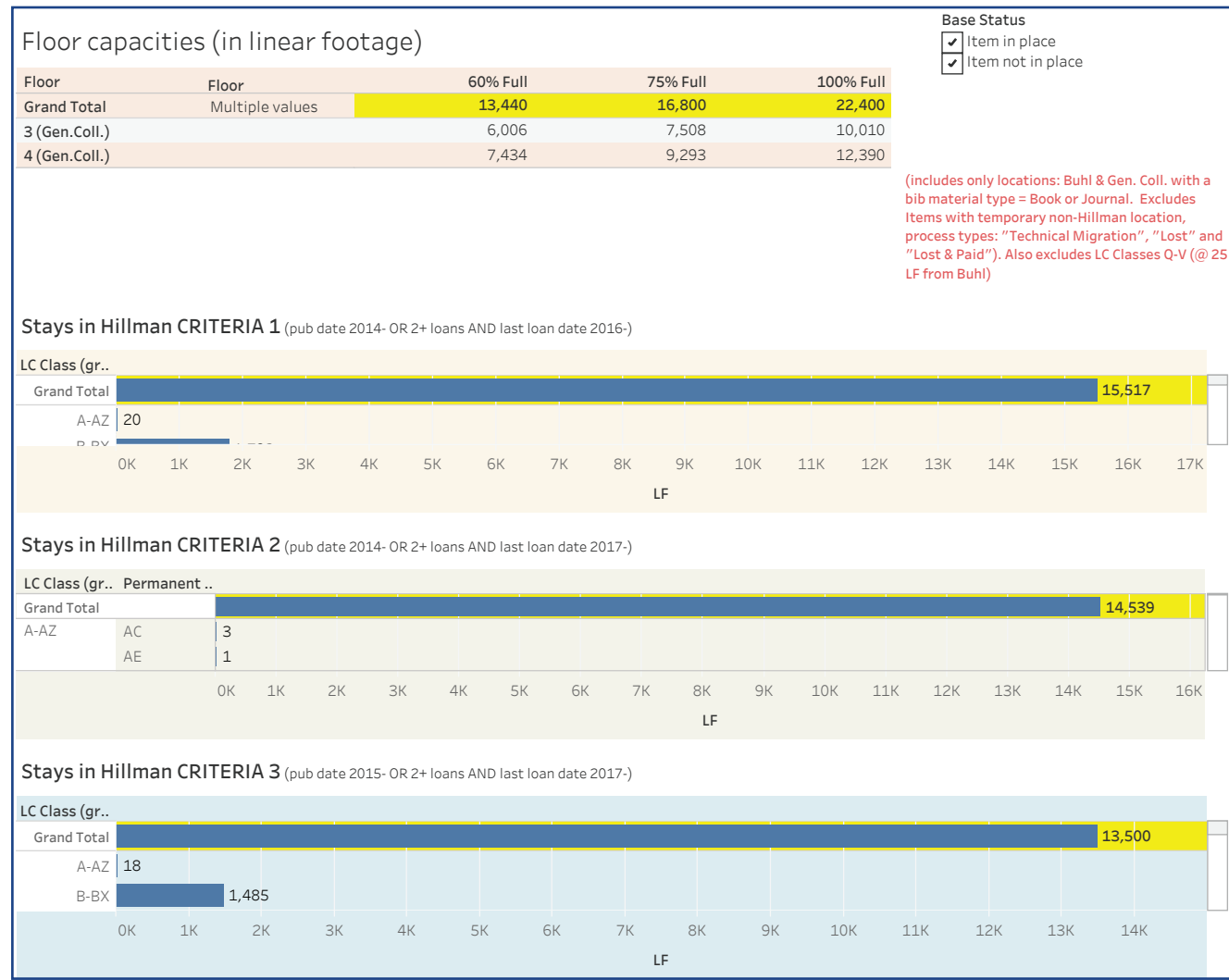


Figure 1: This visualization showed the available linear footage of shelving at different fill rates in the renovated spaces and the estimated linear footage that was used by applying different selection criteria.

Permanent Call Number	Barcode	Title	Publication Date
F2.3 S34 1996	31735037632522	National Geographic's driving guides to America.	c1996.
F4 W66 2002	31735049669058	The New England village /	2002.
F4.5 .W75 2001	31735042858716	Writing New England : an anthology from the Puritans to the present 2001.	
F4.6 .S7	317350110177164	Mysterious New England /	c1971.
F6 C85 1994	31735033097894	Cultural resource management : archaeological research, preserv	1994.
F7 B48	31735037774449	The Puritan origins of the American self /	1975.
F7 B77 1995	31735035868805	The Puritan experiment : New England society from Bradford to E	c1995.
F7 C3	31735020820100	Puritanism and the wilderness; the intellectual significance of the	1969.
F7 C36 1999	31735040827846	Ye heart of a man : the domestic life of men in colonial New Engla	1999.
F7 C6 1970	31735003198656	The eastern frontier; the settlement of Northern New England, 161	1970.
F7 C74 2006	31735054502897	Saints and strangers : New England in British North America /	2006.
F7 C93 1987	31735021279629	Coming over : migration and communication between England am	1987.
F7 F758 1991	31735025776174	The long argument : English Puritanism and the shaping of New E	c1991.

Figure 3: This is an example of a pull list for Storage. This list of items was generated in Tableau by applying specific filters (selection criteria) and exported to an Excel Spreadsheet for use by staff to pull and send to our high-density storage facility.

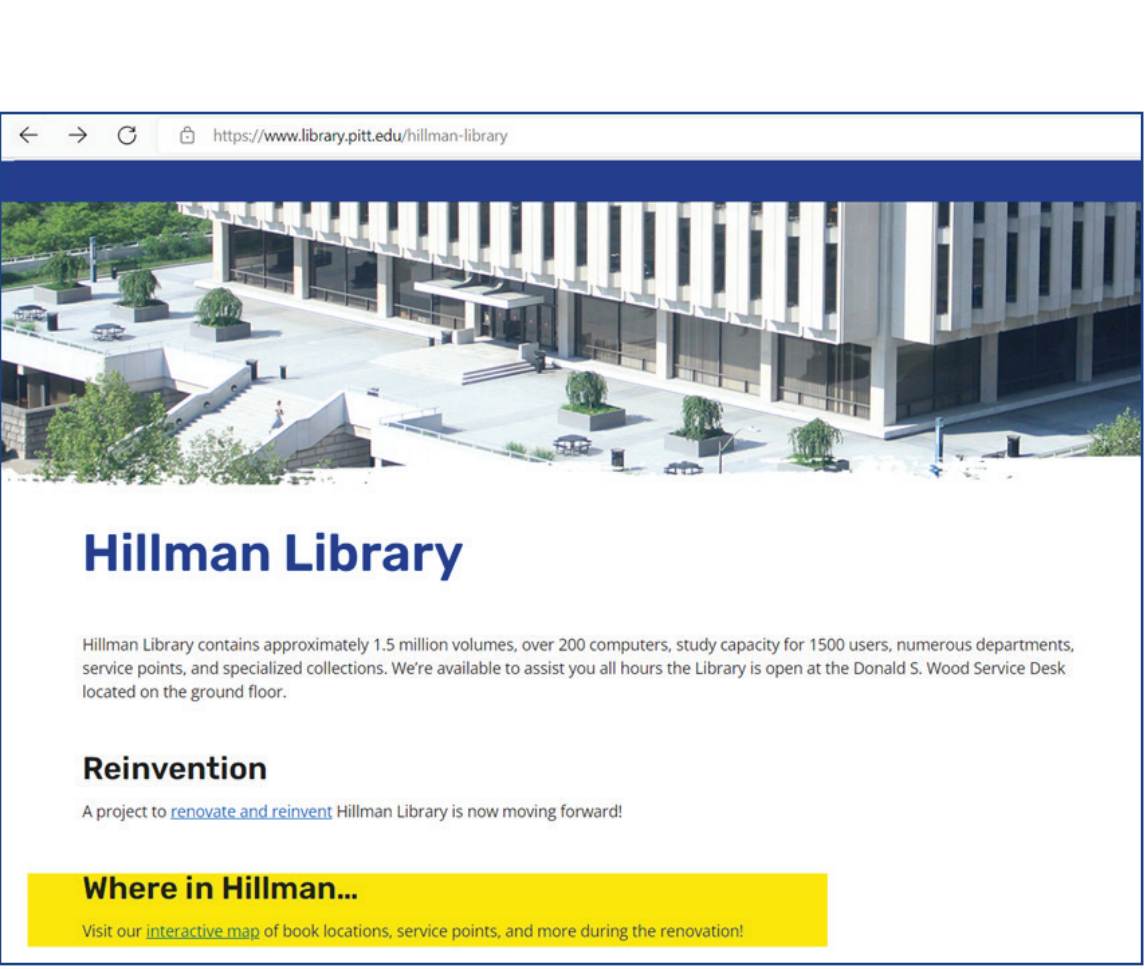


Figure 4: This image shows the link to the interactive map from the library's website.

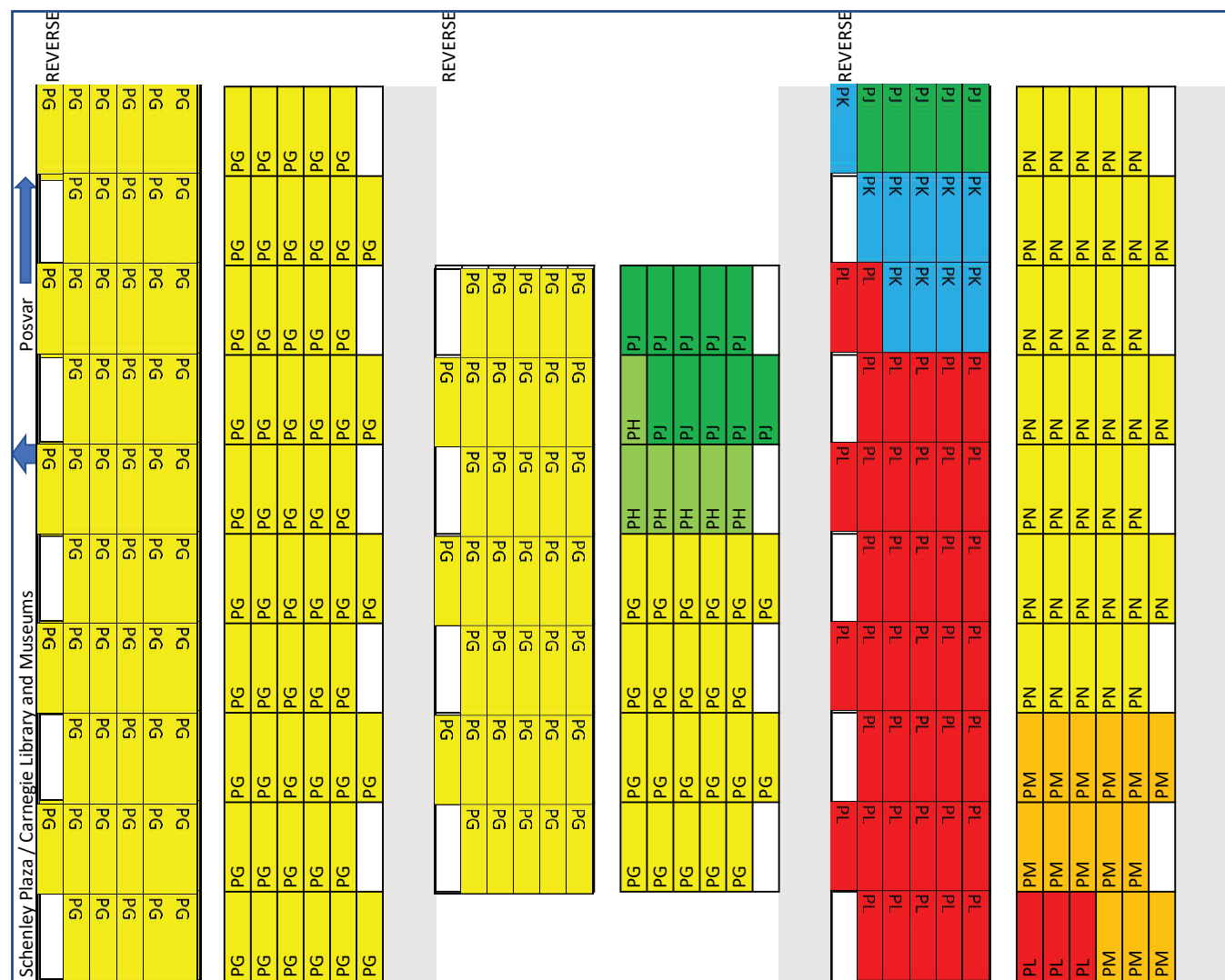


Figure 6: Image of future shelf mapping, showing estimated distribution of call numbers

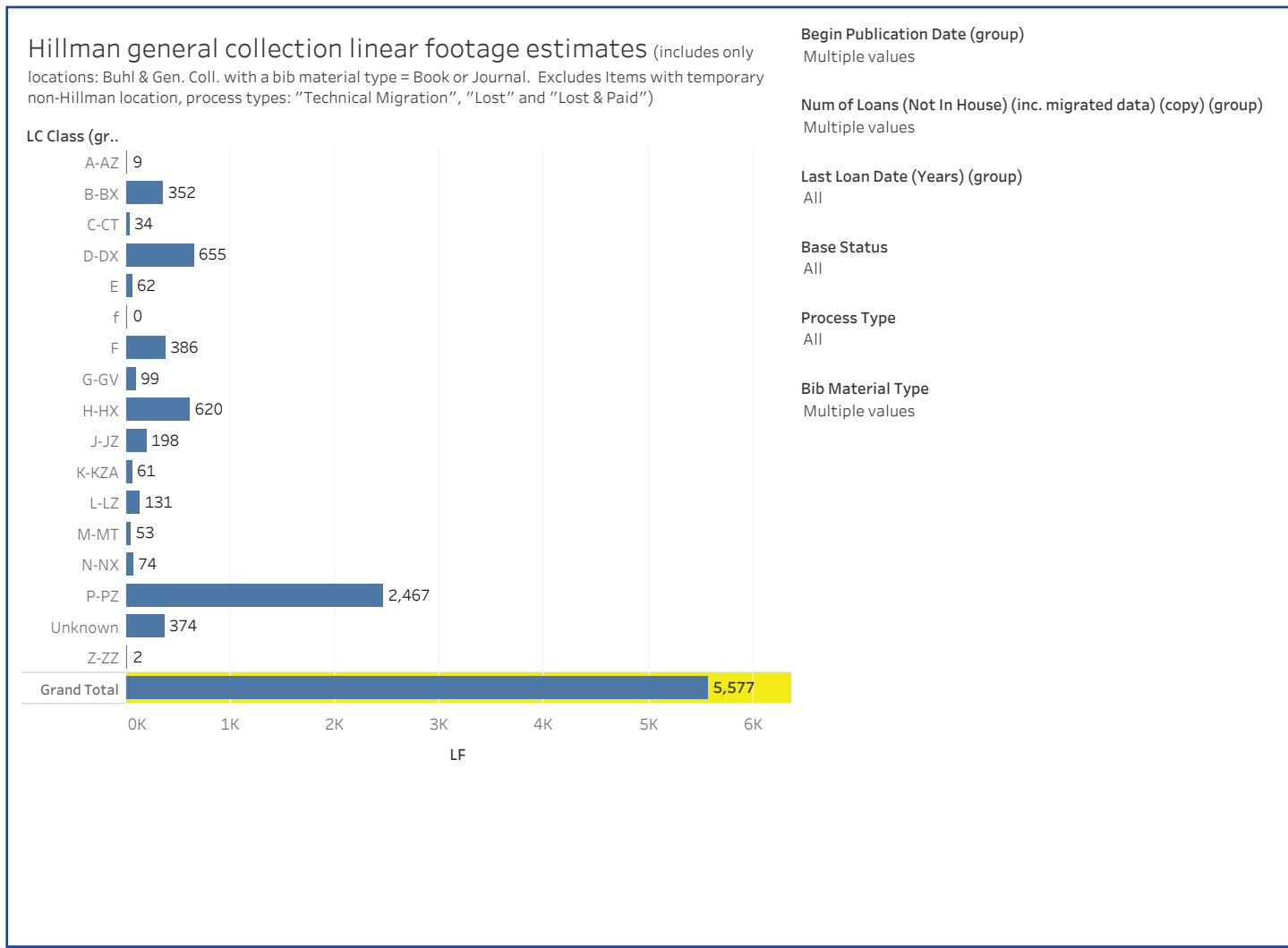


Figure 2: This visualization enabled users to test different selection criteria to see impact on linear footage of specific LC classes

Wayfinding

- Hillman floor plan and spreadsheet with location descriptions and coordinates was used to create interactive map in Tableau
 - Organized locations by type: collections, services, technology, closed for renovation
 - Interactive nested filters applied to Tableau map, so users could select location type, and then subcategory [e.g. Collections => B-BX (Philo.,Psych. Religion) or Services => Cup & Chaucer Café]
 - Embedded on the library website
 - Stand-alone kiosk in library
 - Easily updated and adaptable

Collection Mapping

- Excel spreadsheets were used to calculate shelves needed and visually distribute collection across available shelves and ranges.
 - Shelving calculations based on snapshot physical measurements of collection as well as data from Collection Modelling tool and estimates of future growth. Generated linear footage estimates of material remaining in Hillman by LC class, and added in expected 3-year growth (based on growth previous 18 months) and buffer space
 - Enabled us to ‘map’ collections virtually to ensure material would fit, accommodate growth, and follow logical order

RESULTS AND APPLICATIONS

- The tools were used.
 - Over 8,000 views of interactive map
 - Collection model enabled executive level views and granular operational views that informed planning and logistics.
- Hillman final collection distribution effectively right-sized (fit into available space, with sufficient growth space)
- Renovated spaces feature new, high-use, and boutique collections while low-use materials were shifted to high-density storage.
- Tools uncovered some data inconsistencies and will play a role in future clean-up plans.
- Collection modelling has been applied to other Pitt libraries to assist with library mergers and other renovation projects and will continue to be used for collection maintenance and routine ‘send to storage’ processes.
- All of these tools are easily replicable and applicable to other libraries for a variety of purposes.
 - Tableau public is an option for those who don't have Tableau desktop & an institutional Tableau server
- These tools could be useful for planning collections to spotlight, identifying duplicates across various locations and identifying areas of inventory clean-up.

LIMITATIONS

The tools have evolved with the renovation projects, and we continue to make improvements. However, there are some limitations to keep in mind.

- Some data cleaning may be required
 - This will vary depending upon the completeness, accuracy and consistency of the cataloging records and other underlying data
- Need some familiarity with Tableau or other data visualization tools
 - Especially critical when applying multiple filters and parameters
- Identifying and reviewing of multivolume sets still involves some ‘hands on’ evaluation

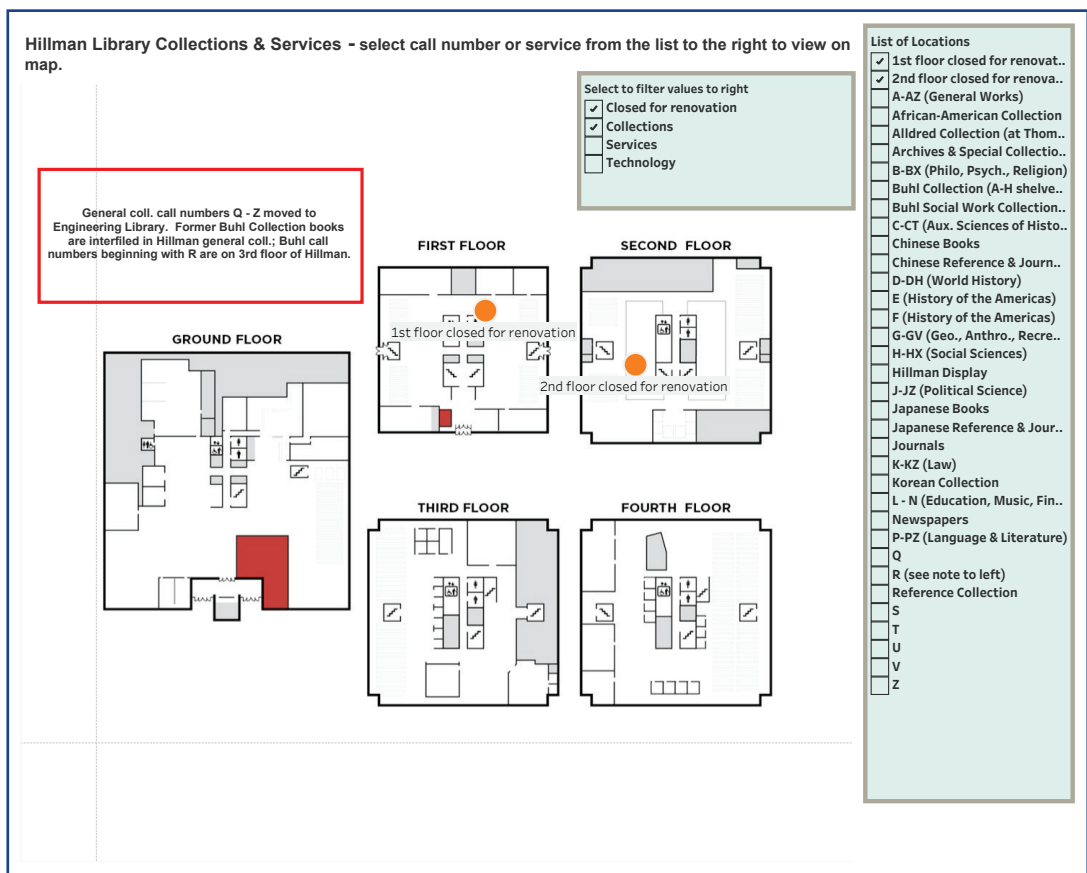


Figure 5: This is a detailed view of the Tableau visualization that is used for the interactive map on the library website and the onsite directional kiosk.

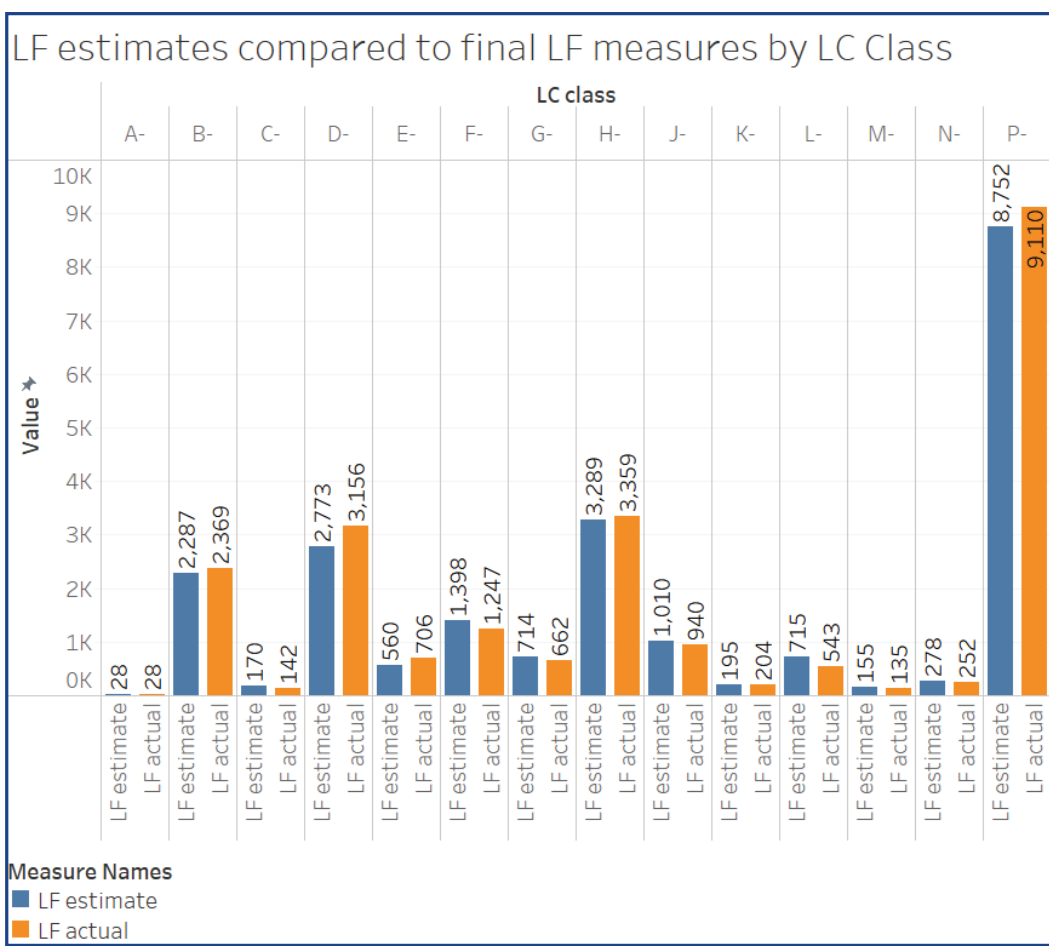


Figure 7: This graph shows the estimated linear footage needed including growth space for each LC class compared to the actual linear footage allotted to each call number range for the final shelving locations