

Introduction and Overview

- The GIS and Data Services team, based out of McKeldin Library, provides a variety of GIS and statistical consultation services to the University of Maryland community.
- To better understand our patron base and the potential impact of location on the reach of our services, we performed an exploratory analysis of our transaction intake data (March of 2021 to present).
- We assumed that most users' daily activity on campus tends to congregate around the building where their academic department is based.
- For data preparation, all transactions with incomplete or missing department information were removed, as well as those that requested remote services such as access to the virtual GIS lab.

Methodology

- All academic buildings represented in the dataset were geocoded using ArcGIS Pro.
- A service area analysis, based on the network of footpaths on campus, was performed to sort all relevant academic buildings into 5-, 10-, 15-, and 20-minute walking thresholds.
- Kernel density estimation was used to find hotspots where the density of transactions (based on the building they originate from) is highest.

Fig. 1: Study Area

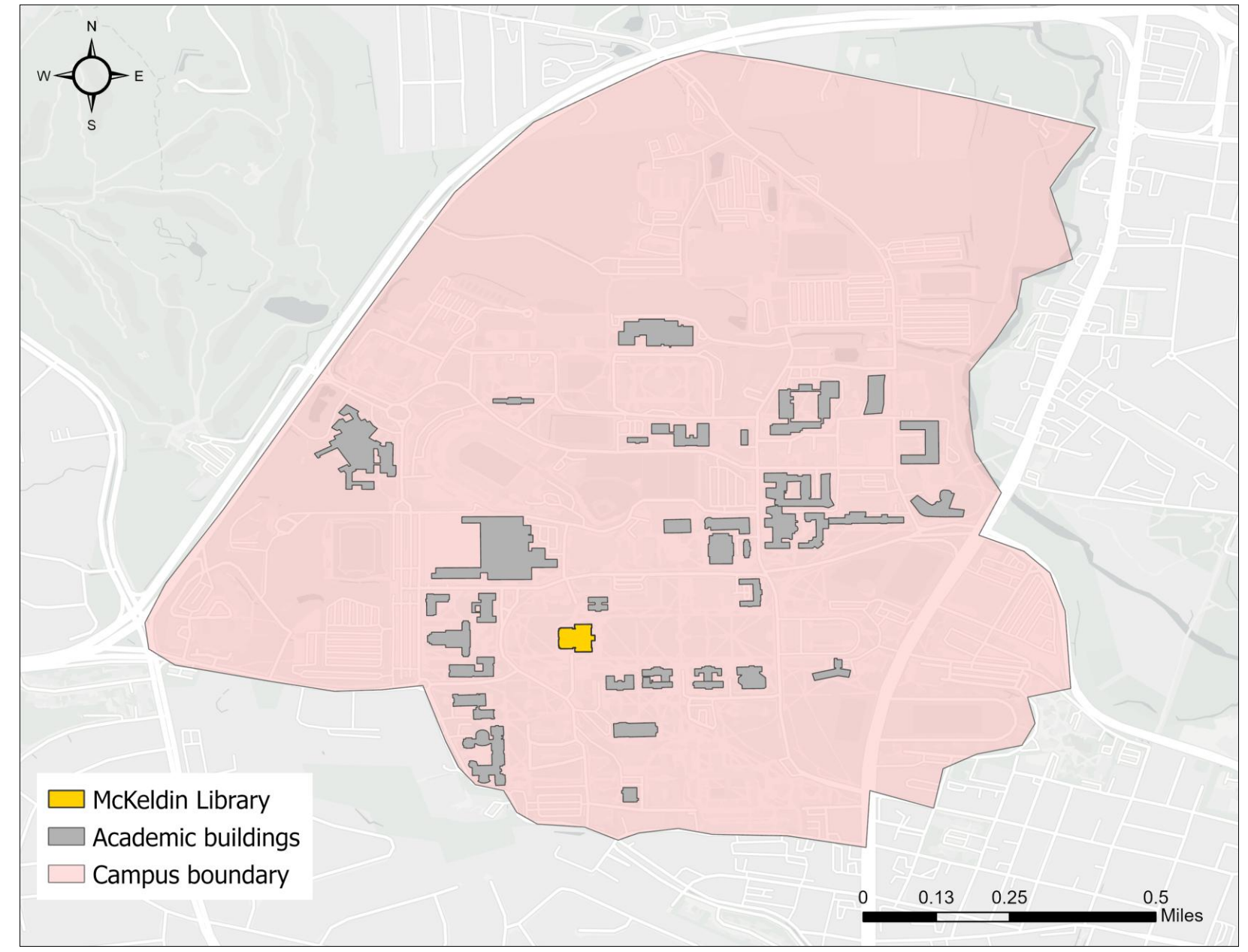


Fig. 3: Kernel Density Hotspots

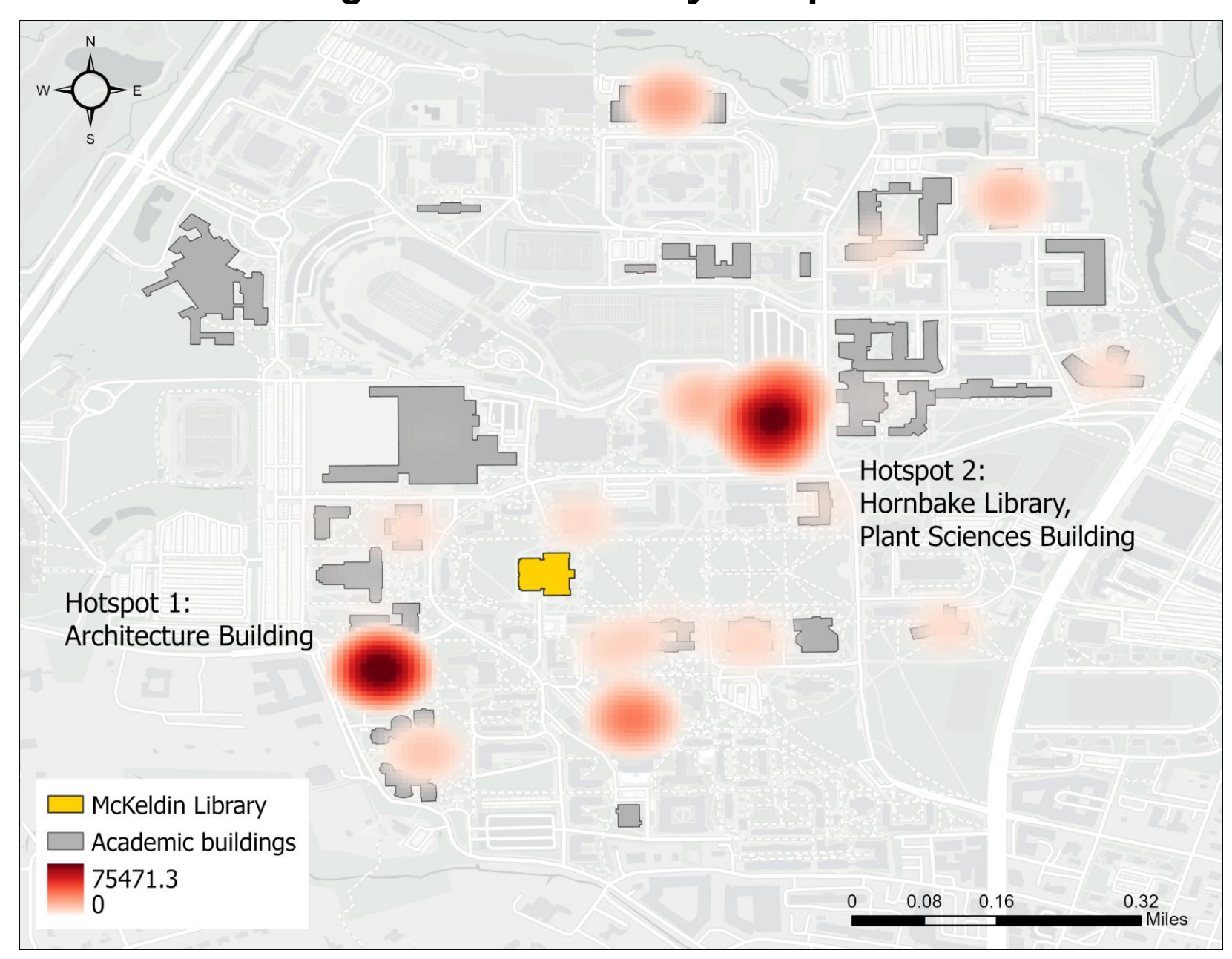


Fig. 2: Service Areas (Walking Dist.) and Transactions per Building

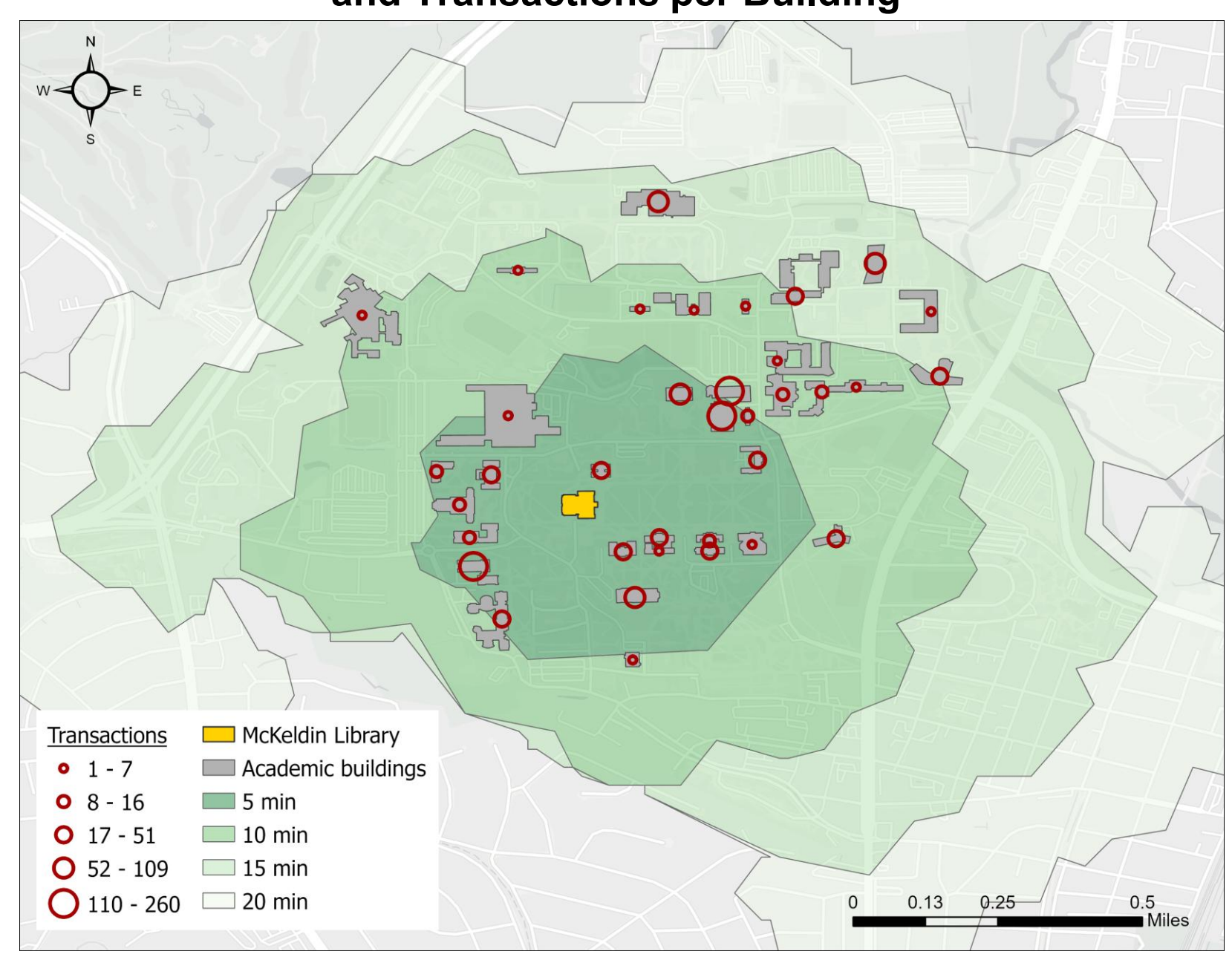


Fig. 4: Department Count by Walking Distance Threshold

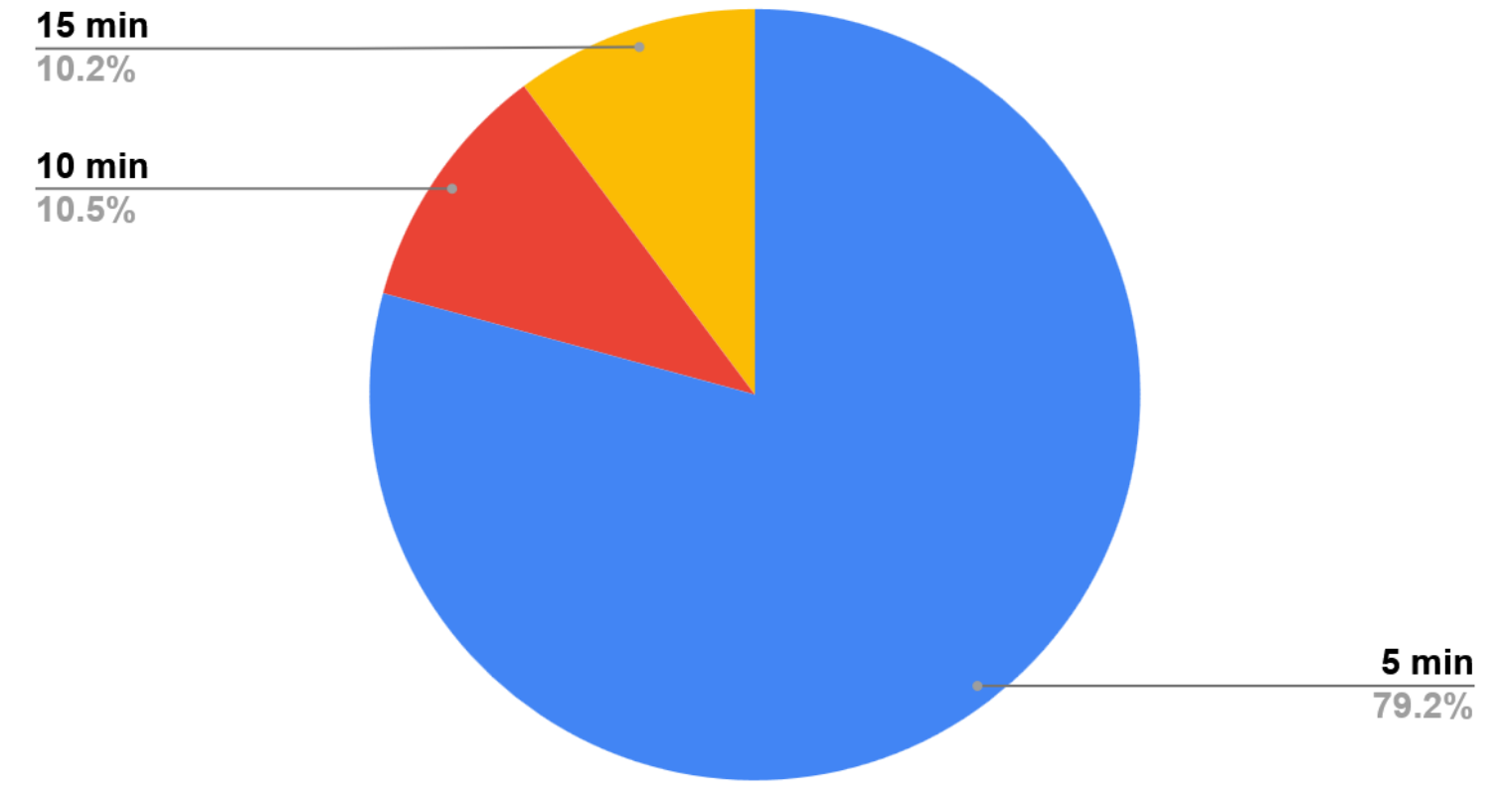


Fig. 5: Transaction Count by Department, 0-5 min. Walking Distance

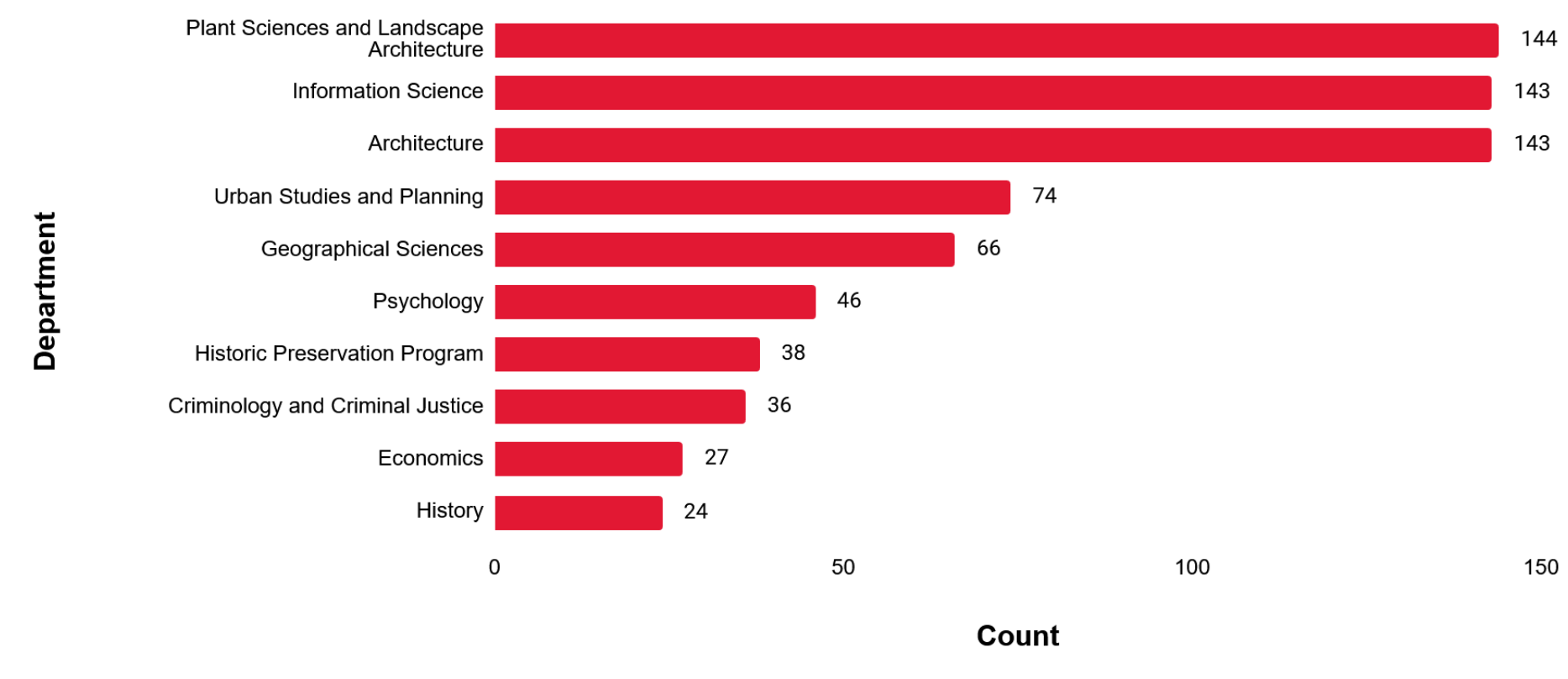


Fig. 6: Transaction Count by Department, 5-10 Min. Walking Distance

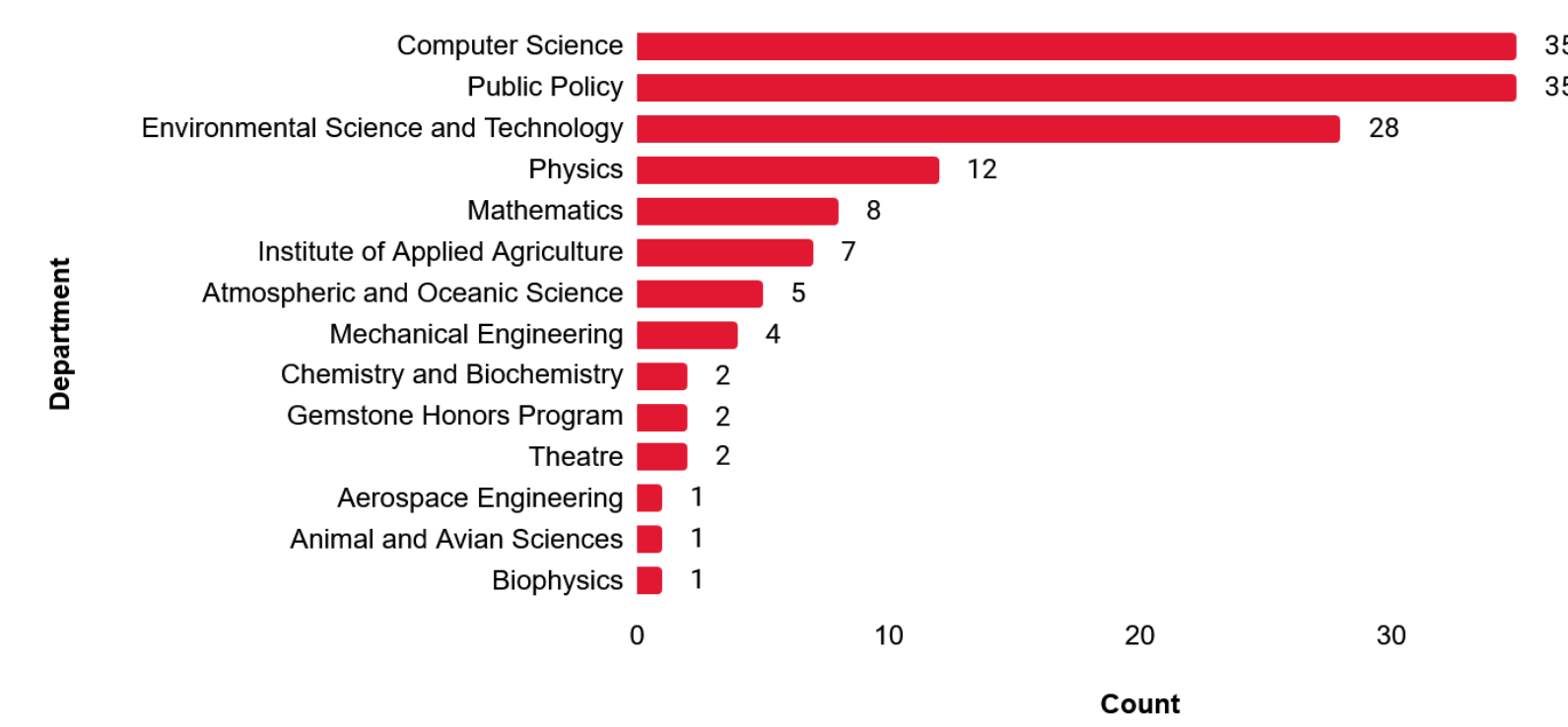


Fig. 7: Transaction Count by Department, 10-15 Min. Walking Distance

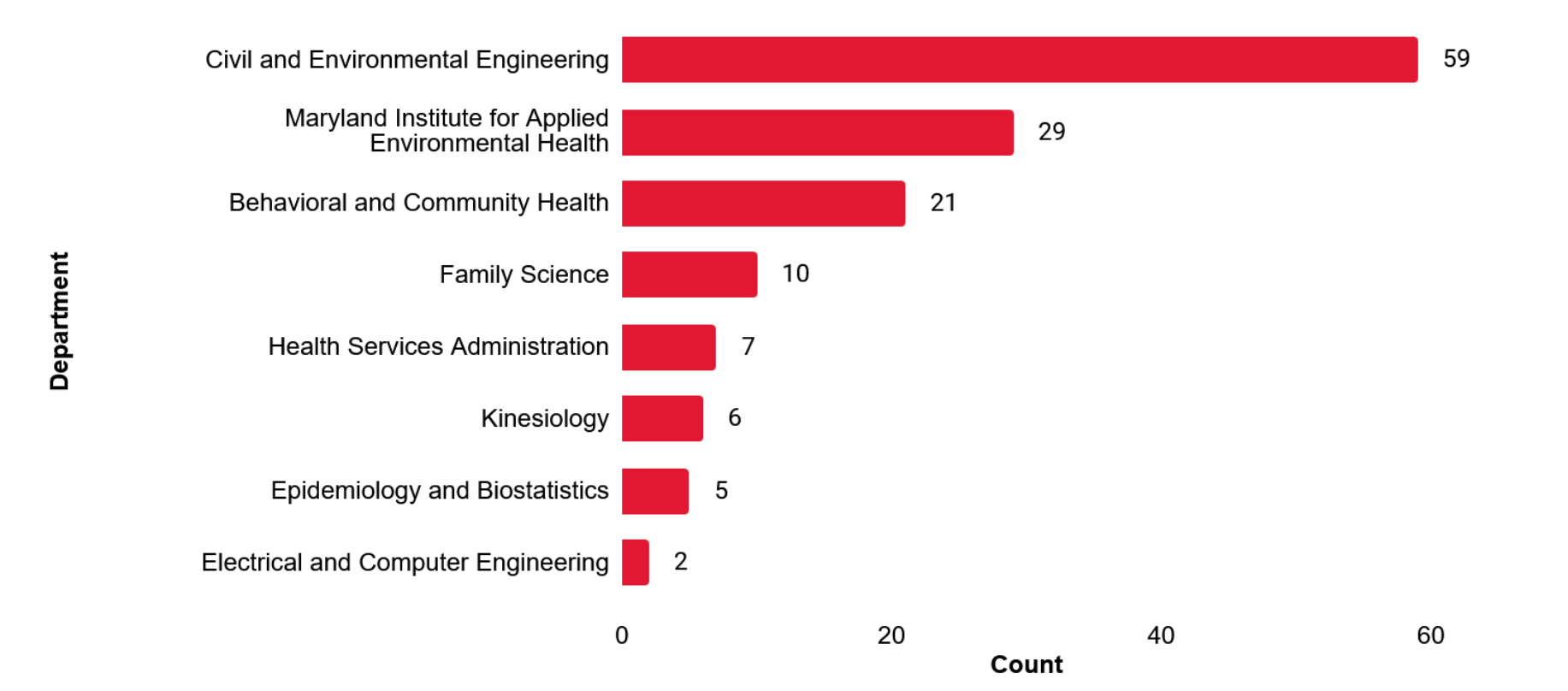
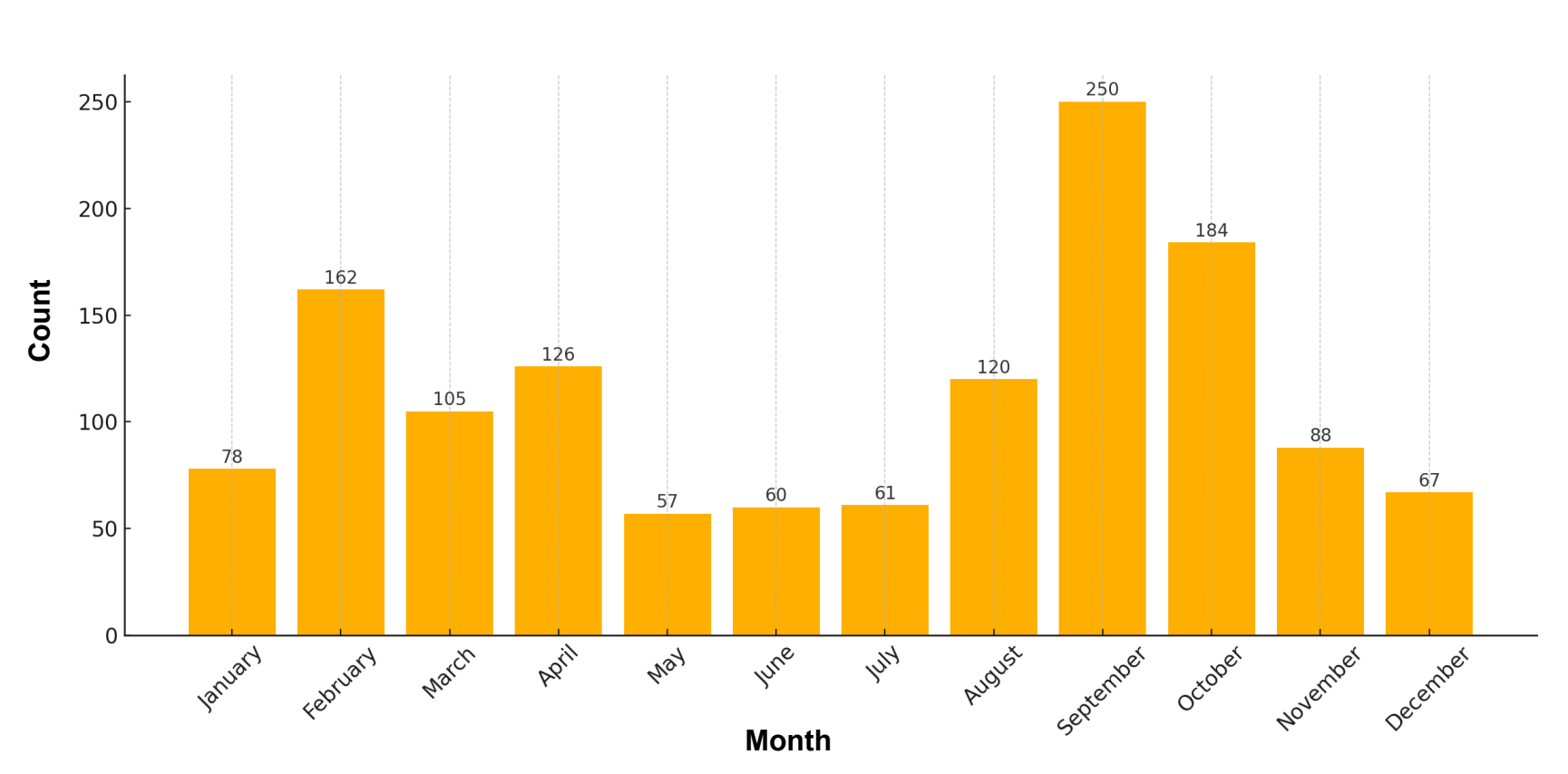


Fig. 8: Detected Hotspots

Hotspot 1: Architecture Building				
Department	Consultations	Grad	Undergrad	Faculty
Architecture	143 (55.0%)			
Urban Studies & Planning	74 (28.5%)	74.6%	11.2%	11.9%
Historic Preservation Program	38 (14.6%)			
Real Estate Development Program	5 (1.9%)			

Hotspot 2: Hornbake Library, Plant Sciences Building				
Department	Consultations	Grad	Undergrad	Faculty
Information Science	160 (48.8%)			
Plant Sciences and Landscape Architecture	144 (43%)	27.8%	60.6%	5.1%
Letters and Sciences	22 (6.6%)			
Entomology	8 (2.4%)			
Library and Information Science	8 (2.4%)			
Maryland Institute for Technology in the Humanities	5 (1.5%)			
Information Management	3 (0.9%)			
Human-Computer Interaction	1 (0.3%)			
Social Data Science	1 (0.3%)			

Fig. 9: Transactions by Month



Conclusions

- Most of our patrons' departments were reachable within a 5-min walking distance. A comparatively significant drop-off occurred at 10- and 15-min thresholds, with 20-min resulting redundant.
- Identification of two important request "hotspots": the Architecture Bldg. and the Hornbake Library/Plant Sciences Bldg. cluster. It is recommended to pursue increased outreach and targeted services to their departments.
- The colleges with the least requests were the Philip Merrill College of Journalism, Letters and Sciences, and the College of Education, respectively. A combination of factors, including a lack of need for GIS technology in coursework and research, may be responsible, and the net value of increasing outreach should be assessed on a holistic and qualitative basis.