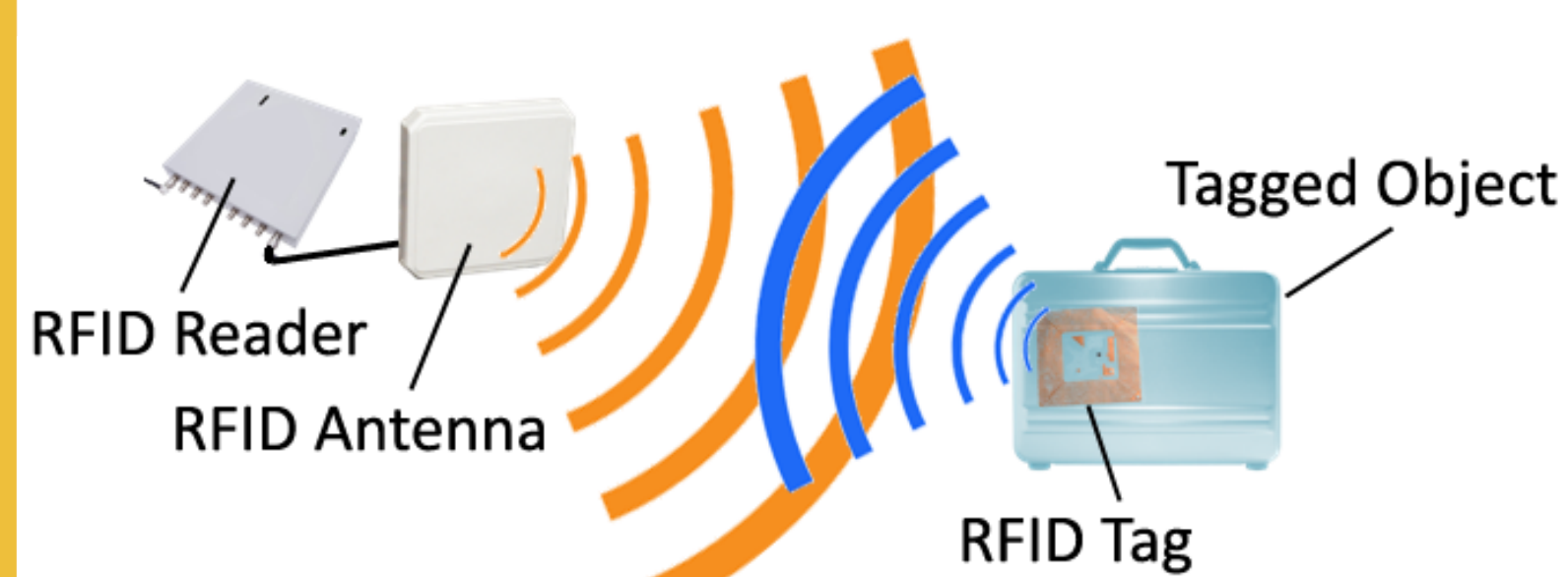# Longitudinal Study of a Building-Scale RFID Ecosystem
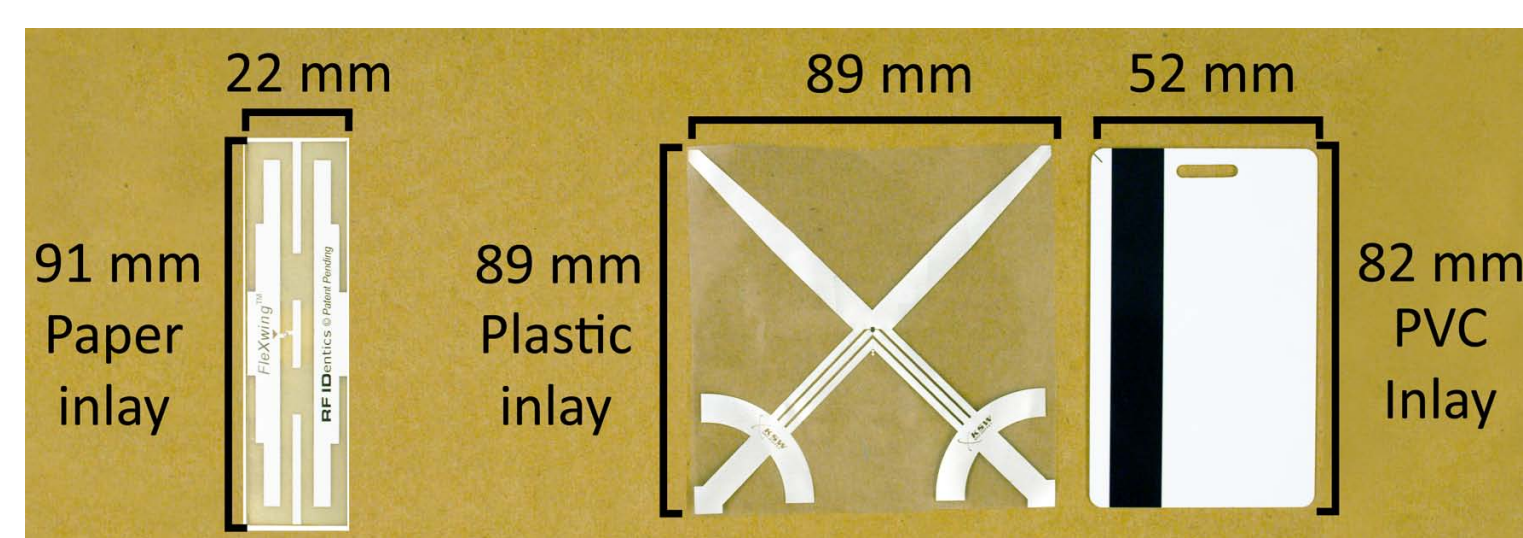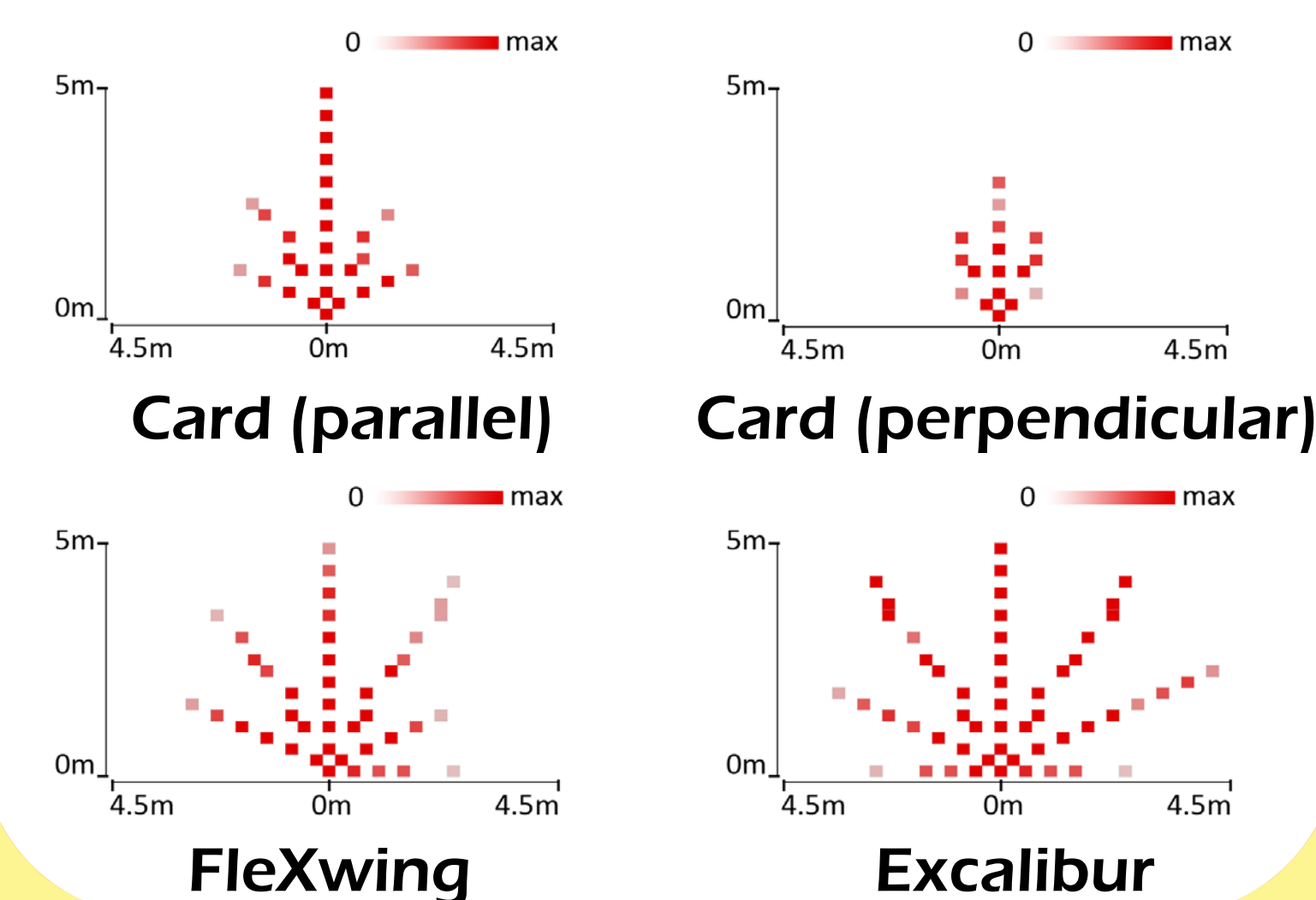
Study Parameters

- Passive EPC Gen 2 Tags
- 47 readers, 160 antennas
- 324 tags on people, objects
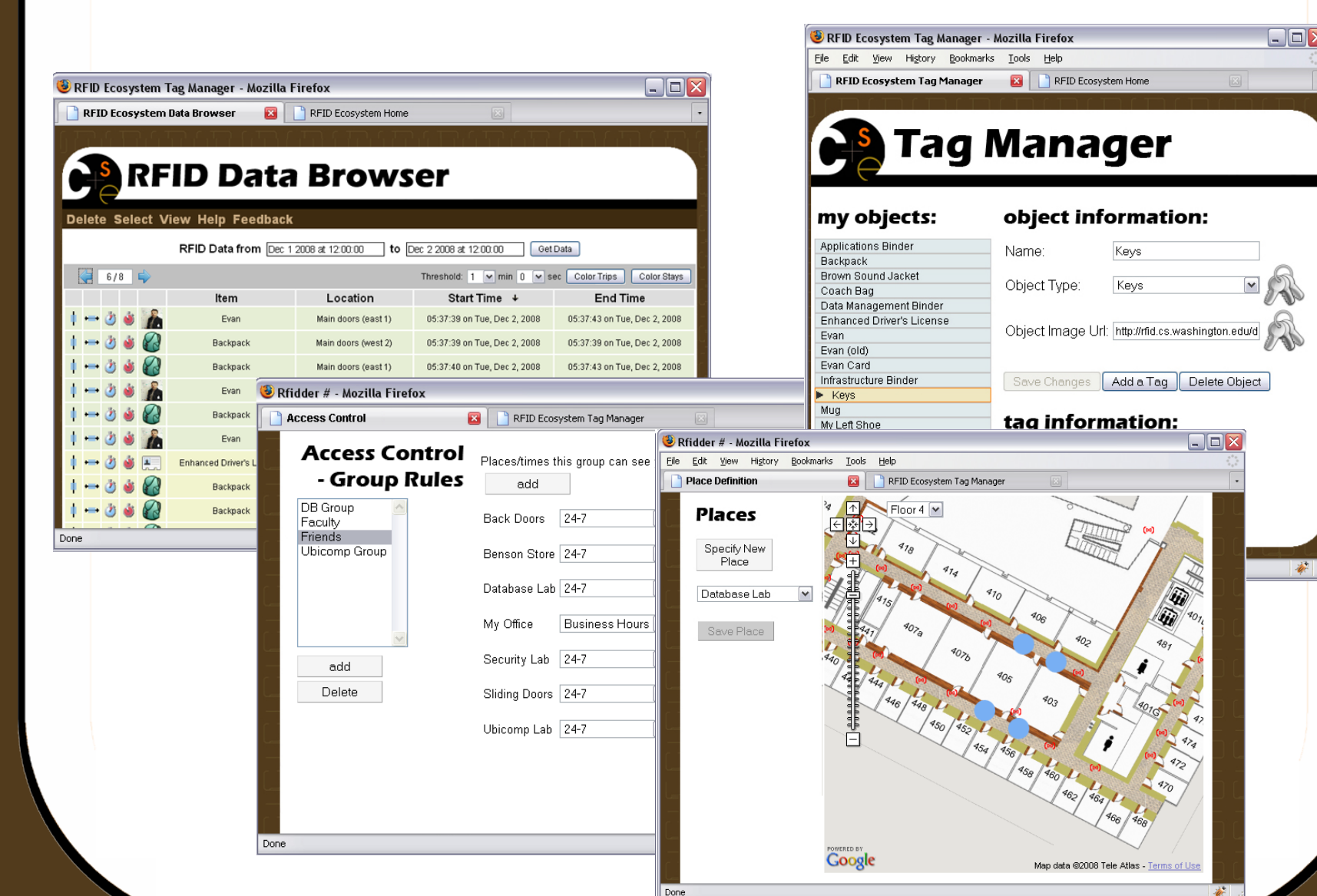- Search & social applications
- 67 Participants
- 4 weeks

Tagged Object
RFID Reader
RFID Antenna
RFID Tag

Tag Benchmarks

22 mm   89 mm   52 mm
91 mm Paper inlay   89 mm Plastic inlay   82 mm PVC Inlay

- FleXwing, Excalibur, Card
- Baseline lab benchmarks:

Card (parallel)   Card (perpendicular)
FleXwing   Excalibur

User Tools

- Tag management tool
- Place definition tool
- Privacy management tools

RFID Data Browser
Tag Manager
Access Control - Group Rules
Places

Data Collection

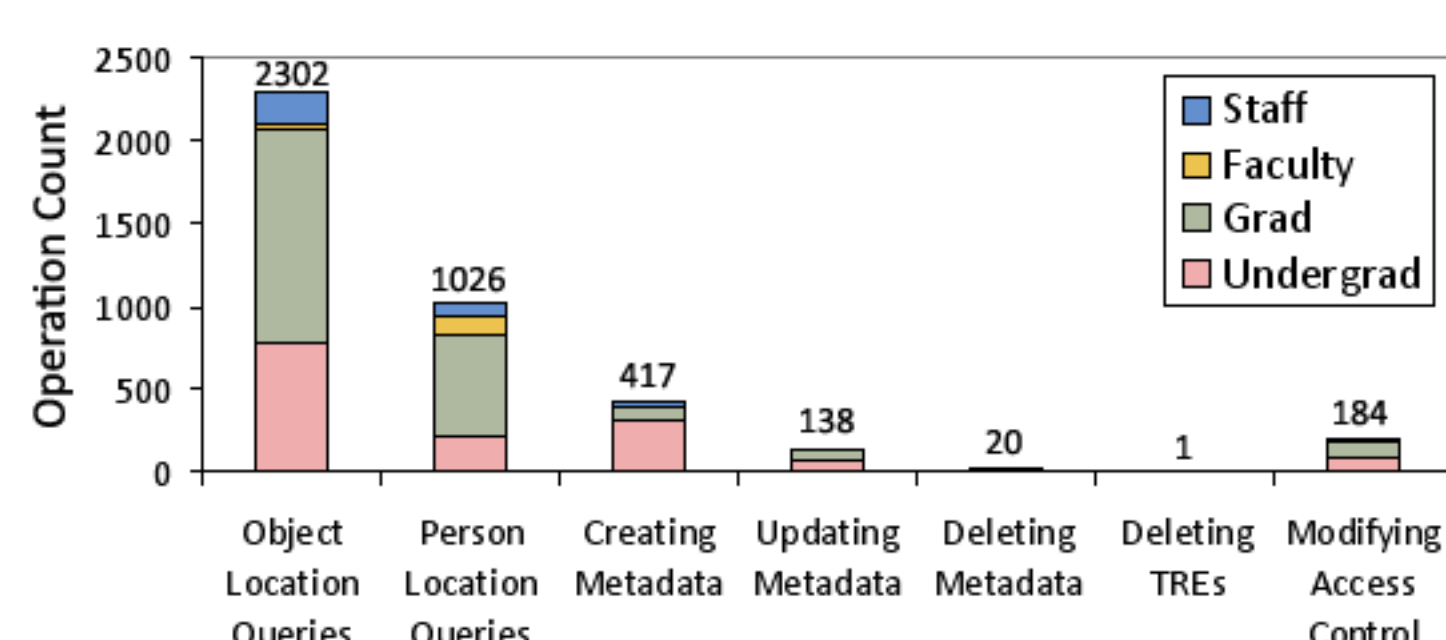- 1.5 reads total, 2200/hr avg, 8400/hr max

Day
Hour
Reader Antenna
# of STAYs
0m 5m
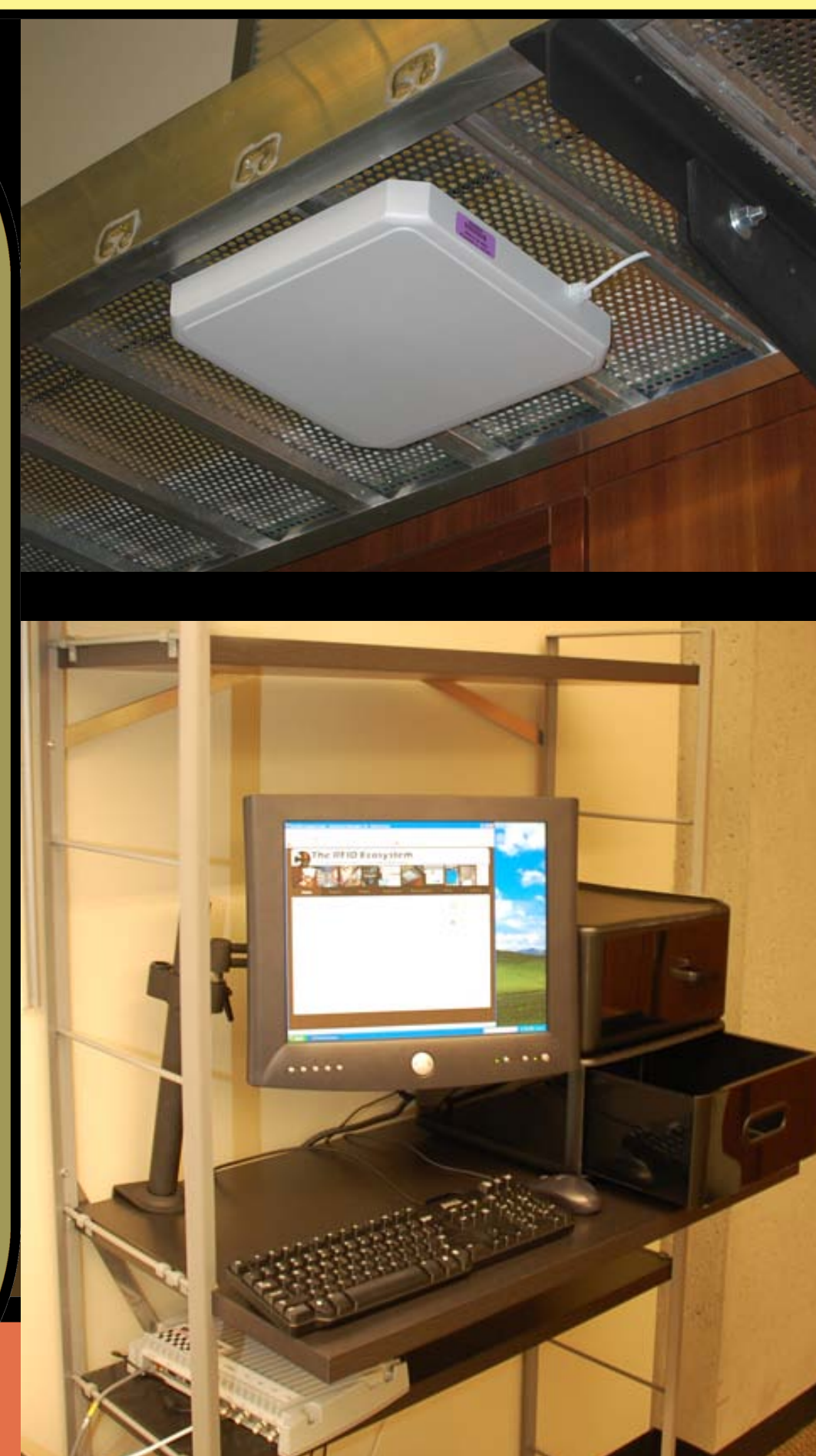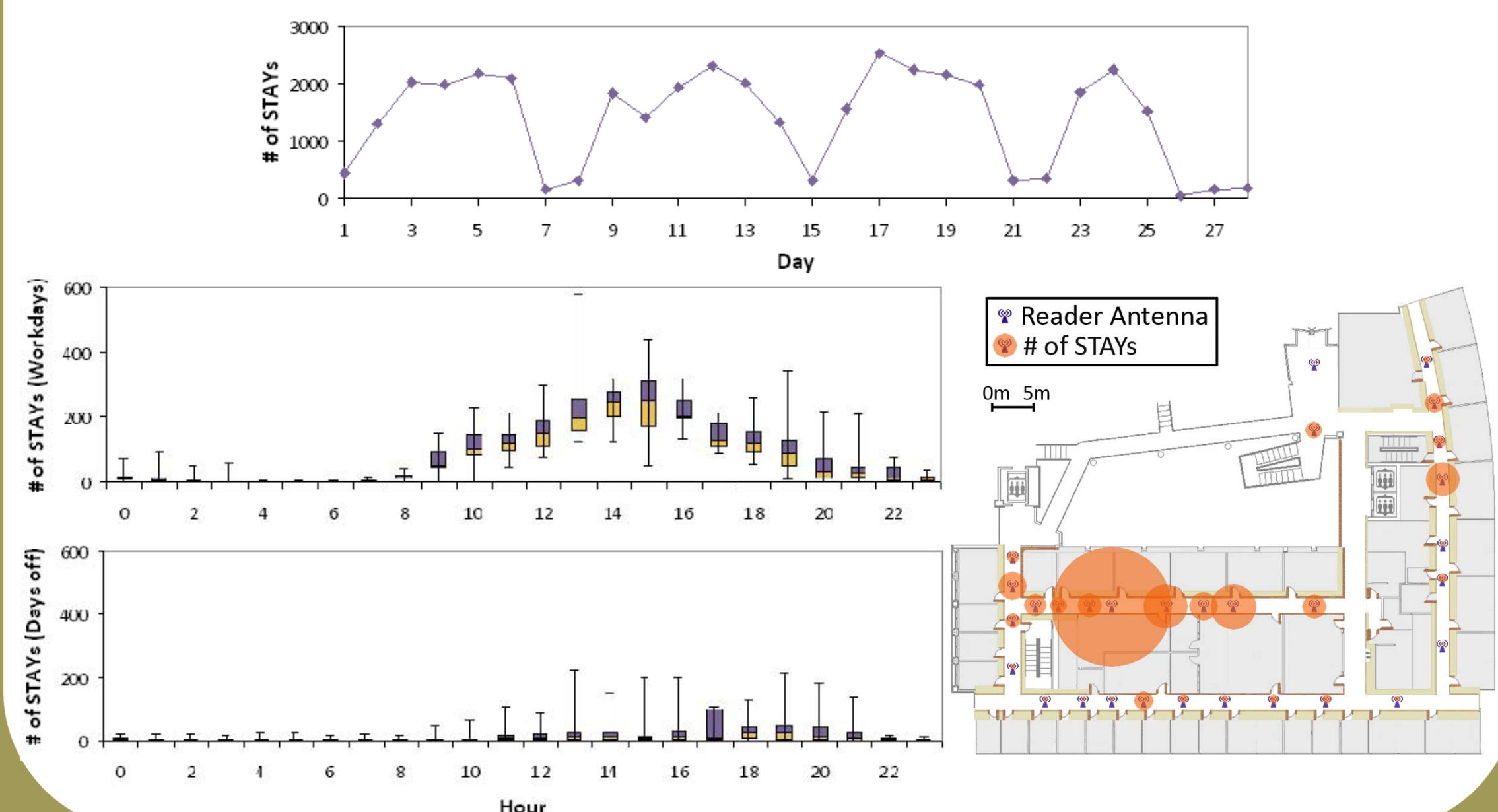
People and Objects

- Readability correlated with:
  - Tag type, mounting method, object material, user incentive

Detection Rate
Card FleXwing Excalibur
Security Badge Books Personal Clothing
Undergrads Grads Faculty
Badges Objects Participants
# of STAYs
Detection Rate After / Detection Rate Before
Total # STAYs After / Total # STAYs Before
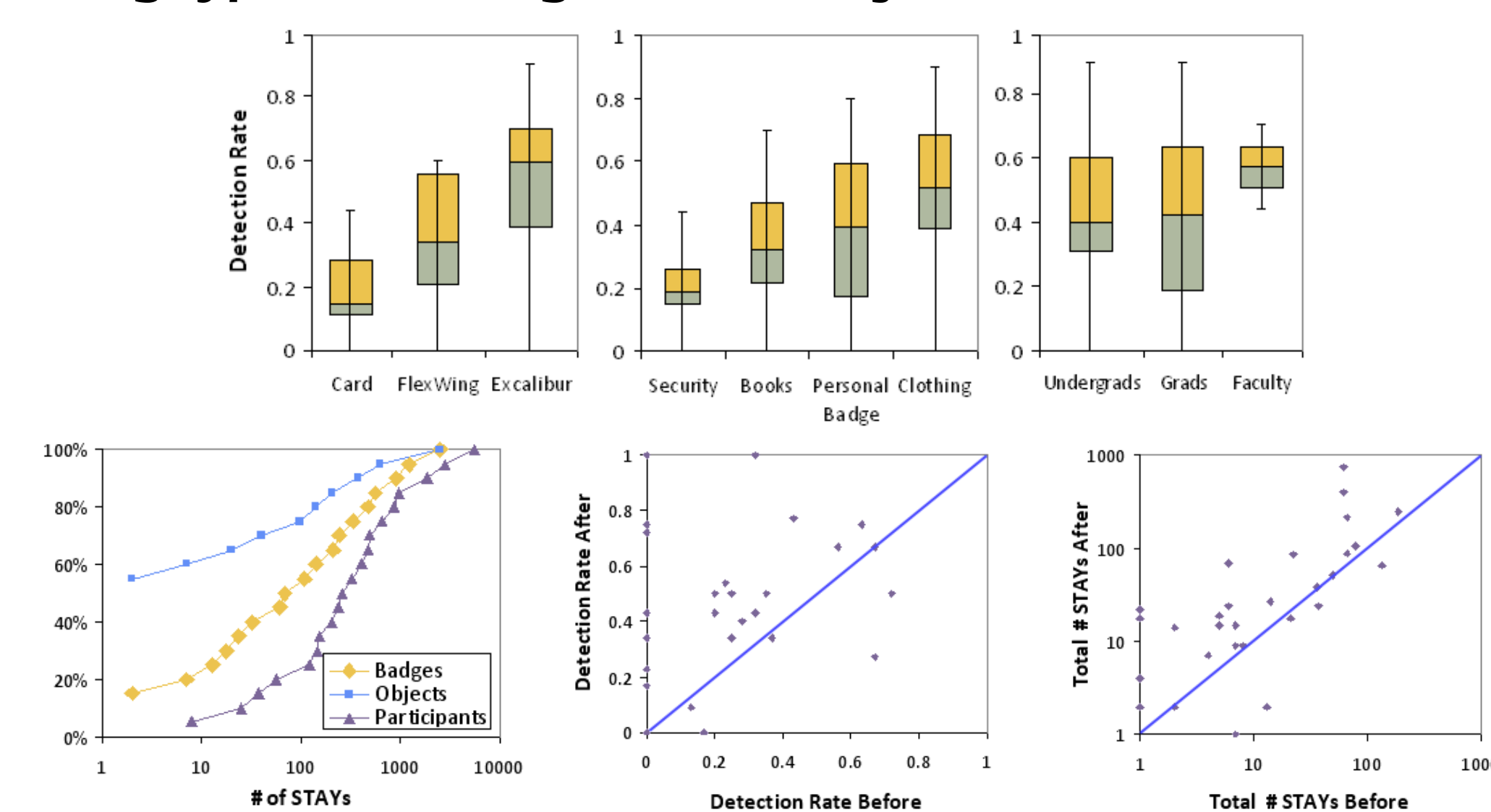
Applications

- Web-based & mobile apps
- Personal object search
- Friend-finder, Facebook apps
- Usage correlates with tag performance
- Spike in usage first week, then decline

Operation Count
Staff / Faculty / Grad / Undergrad
2302   1026   417   138   20   1   184
Object Location Queries Person Location Queries Creating Metadata Updating Metadata Deleting Metadata Deleting TREs Modifying Access Control

Rfidder
Feed
Evan
Working in CSE 405 since 9:13

You forgot your House Keys in your office

RFID Stats
Most Mobile
Most Read Objects Today
Distinct Antennas Visited Today

http://rfid.cs.washington.edu

Evan Welbourne, Emad Soroush, Magdalena Balazinska, Gaetano Borriello