

Bicycle Parking Plan UW Seattle Campus



BE BOUNDLESS



The following report was prepared in 2023 starting with research on bicycle parking practices on other US university campuses, review of city of Seattle regulations and recommendations, creating a governance structure for project review, and defining project goals. This was followed by an in-depth campus survey of facilities and their utilization in May 2023 (Bike Month) on three mid-week, dry days, during peak (midday) hours.

This report outlines the current conditions, future targets, design standards for facility types, and recommendations for next steps to further enhance the quality of bicycle parking on campus to encourage bicycle ridership.

Project Management Team, December 2023

Report Order



- Introduction
- Bike parking supply and demand conditions
- Implementation recommendations
- Bike parking siting criteria
- Design standards
- Existing bike lockers and bike houses

Introduction

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Why are we doing a bicycle parking plan?

- Transportation Management Plan (TMP) commitment in 2019 Seattle Campus Master Plan
- Increase demand for bicycle mode of travel to reduce single-occupancy vehicle (SOV) mode split
- Establish short-term and long-term bicycle design standards, based on campus utilization and latent demand

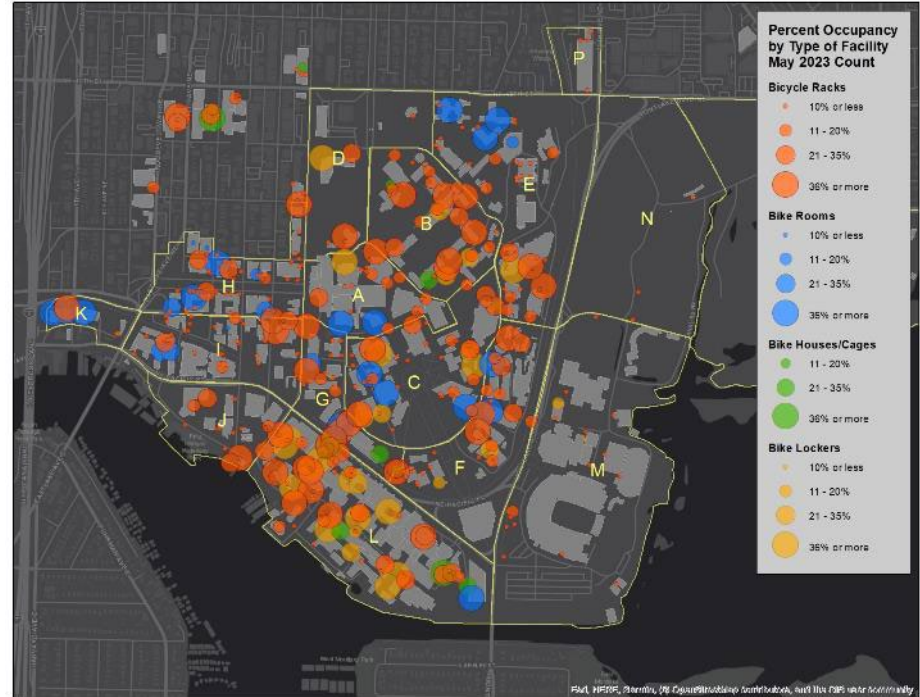
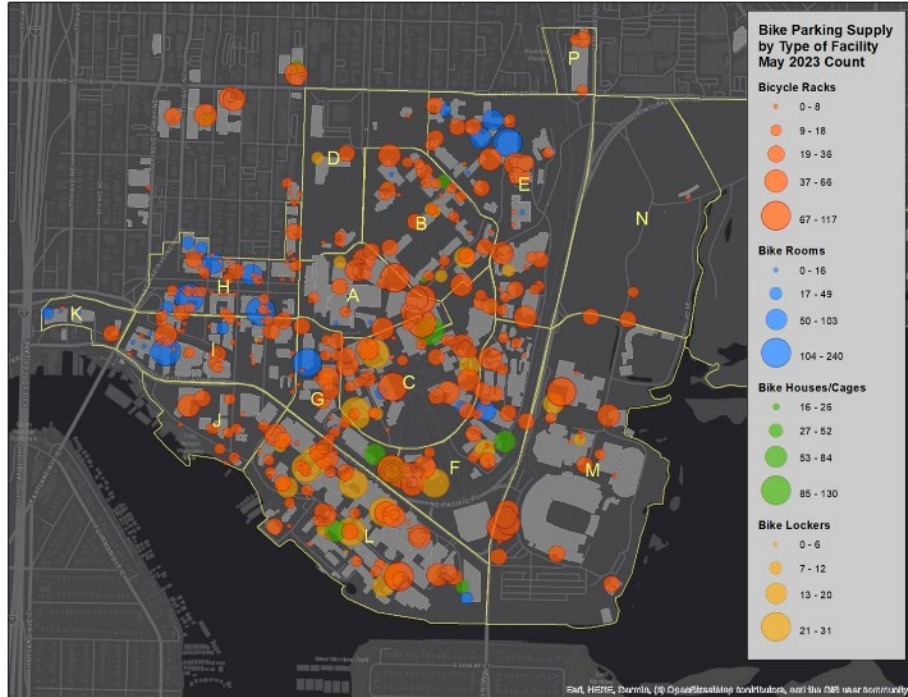
Project Goals



- **Parking Supply & Condition** – understand the existing campus bicycle parking inventory and working condition (racks, lockers, houses, cages, rooms) and identify management practices for managing infrastructure and operations.
- **Best Practices** – learn from other institution best practices and other city regulatory requirements compared to city of Seattle to inform the appropriate methodology for our campus.
- **Parking Demand & Estimating** – develop standards and methodology to establish an appropriate rate of short-term and long-term parking spaces needed by campus zone that serve existing and plans for new buildings.
- **Siting and Design** – develop facility siting and bike facility type selection criteria. Bicycle facility types include the following, at a minimum: short-term parking racks and long-term parking lockers, houses and cages. Support universal access and equity with recommendations.

Bike Parking Supply & Demand Conditions

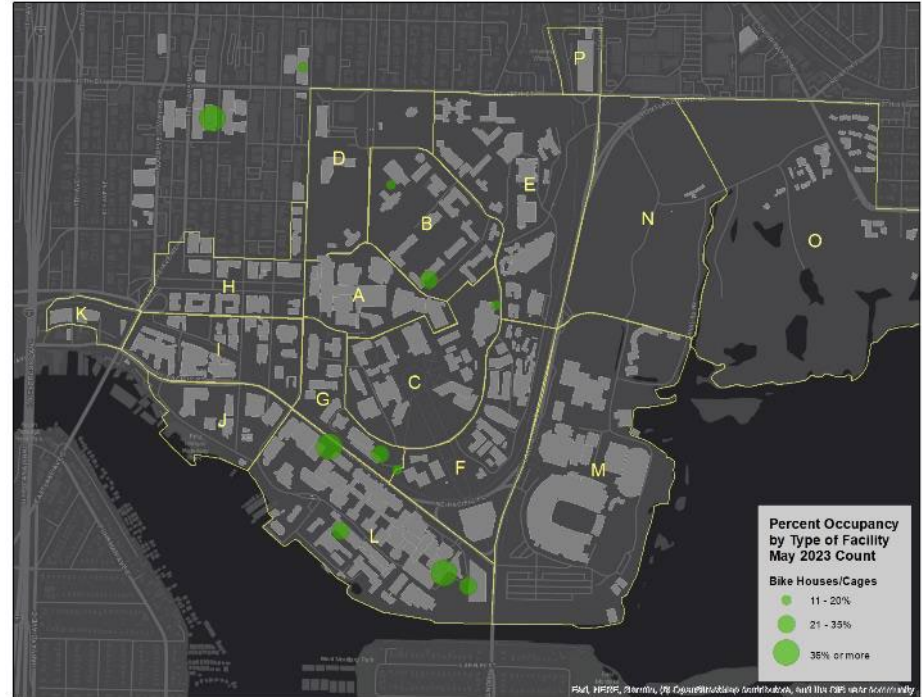
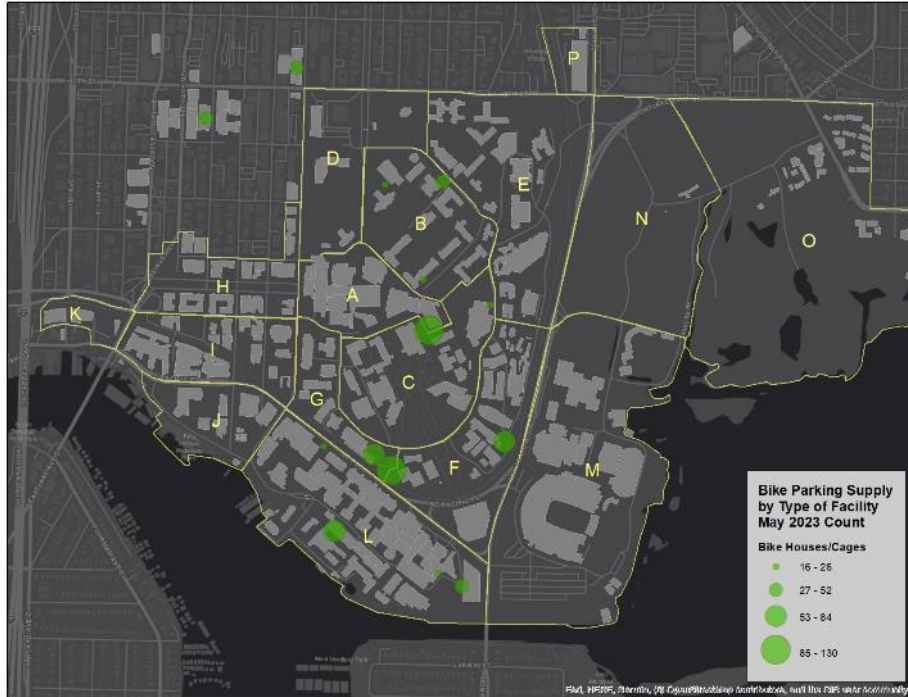
Bike Parking Supply & Demand



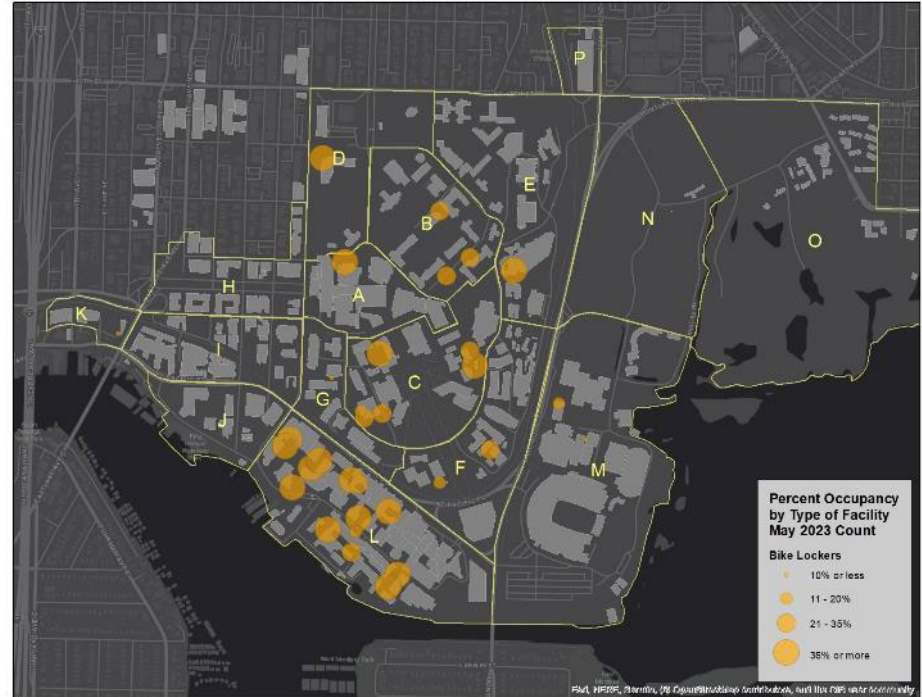
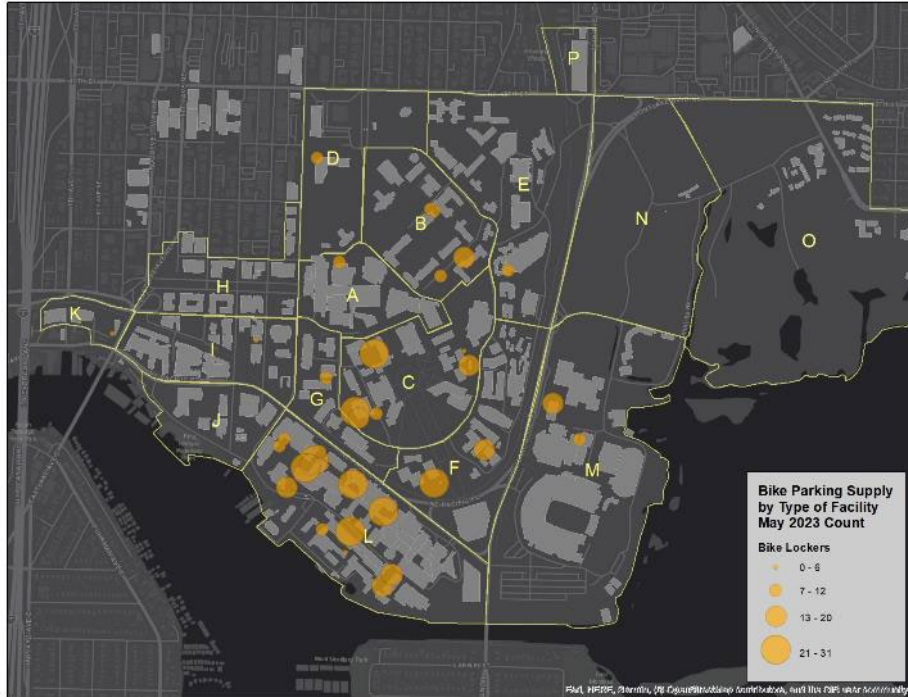
Bike Racks



Bike Houses



Bike Lockers



Bike Rooms



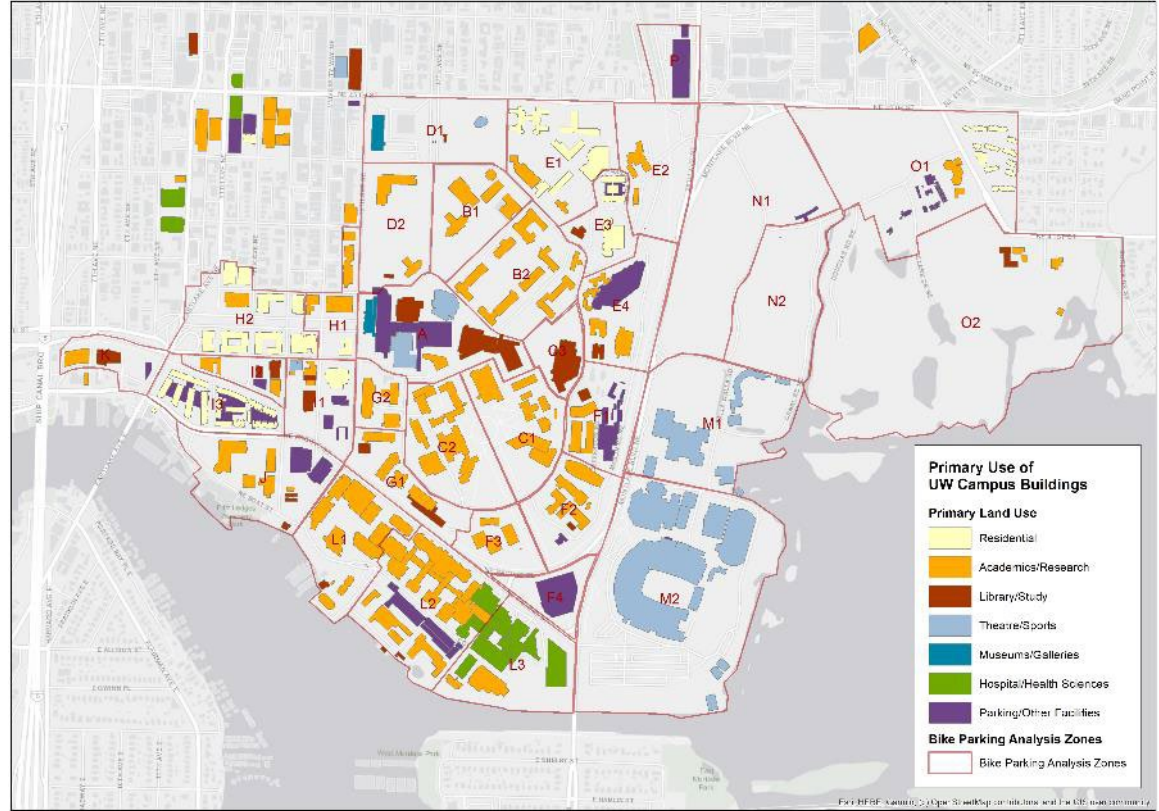
May 2023 Bike Count

- 1 in 5 spaces were occupied across all facilities (19.5%)
- An additional 5% of utilization is parked in offices (per 2022-2023 commuter survey)

Parking Type	Occupancy	Capacity	Utilization
Bike Racks	813	6,246	13.0%
Bike Enclosures/Racks	80	336	23.8%
Bike Houses/Cages	107	463	23.1%
Building Bike Rooms	166	390	42.6%
HFS Bike Rooms	393	1,201	32.7%
Lockers	192	363	52.9%
Total	1,751	8,999	19.5%
Offices (projection)	411		
Projected Total	2,162	8,999	24.0%

UW Campus Building Uses

- 4 Campus Areas – West, Central, South & East
- 36 Campus Zones within TMP boundary
- Grouped by building use and geographic condition



City of Seattle Code Analysis

Campus Area	Building Size in Gross Square Feet					Total SQFT of Existing Buildings
	Primary Building Use					
	Residential	Mixed Use	Library/Study	Hospital/Medical	Theater/Sports	
Central	1,288,667	4,998,858	1,029,081	-	295,104	7,910,238
West	2,149,079	564,294	393,628	-	12,176	3,119,177
South	-	2,607,437	130,770	2,294,972	-	5,033,179
East	362,479	27,463	45,660	-	1,775,000	2,210,602
Within Campus	3,800,225	8,198,052	1,599,139	2,294,972	2,082,280	18,273,196

Primary Building Use (SQFT)

Campus Area	City of Seattle Requirements				Parking (Shortage) or Surplus	
	Short-Term Parking Supply	Long-Term Parking Supply	Short-Term Parking Ratio	Long-Term Parking Ratio	Short-Term Parking Supply	Long-Term Parking Supply
Central	3,110	2,253	3.93	2.85	700.08	(1,177.86)
West	737	1,724	2.36	5.53	1,139.91	(1,273.41)
South	1,338	1,128	2.66	2.24	(332.86)	(562.92)
East	1,860	449	8.41	2.03	(1,118.82)	(417.42)
Within Campus	7,045	5,555	3.86	3.04	388.31	(3,431.62)

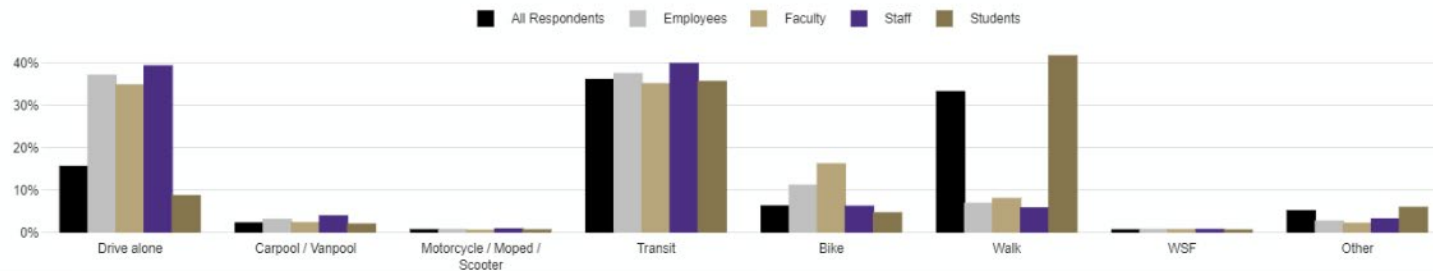
City of Seattle Requirements

Counts vs. Code

- May 2023 counts and Seattle code suggest that there is too much short-term supply (bike racks) on campus. The code does not work for campus as it doesn't capture the nuance and complexity of campus buildings and uses.
- The projected long-term shortage has some validity (on the whole, not the exact number) based on May 2023 counts and utilization patterns of long-term parking on campus.
- Areas have been identified try to increase the use of existing facilities or add greater supply.
- The purpose of this project analysis is to identify where additional supply is needed rather than using the Seattle code.

Bicycle Trips Mode Split

2022 CAMPUS COMMUTE SURVEY



All Respondents	15.6%	2.3%	0.7%	36.2%	6.2%	33.3%	0.6%	5.1%
Employees	37.1%	3.1%	0.7%	37.6%	11.2%	6.9%	0.7%	2.7%
Faculty	34.9%	2.3%	0.5%	35.1%	16.2%	8.0%	0.7%	2.2%
Staff	39.4%	3.9%	0.9%	39.9%	6.2%	5.8%	0.7%	3.2%
Students	8.7%	2.0%	0.6%	35.7%	4.7%	41.8%	0.6%	5.9%



UW U-PASS CTR Report

Source: **Trip Data**—Trips take Monday through Friday Base: All respondents (**OverallWk**)

Percentages are based on total weekday trips to campus and in those instances where multiple modes were reported for a single trip (in the case of linked trips) reflect the mode used for the longest portion of the trip. (**EXCLUDES** Telecommute)



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Implementation Recommendations

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Strategic Actions



1. **Efficiency Goal** – Increase utilization of existing available capacity through enhanced promotion, management, and monitoring of supply.
2. **Equity Goal** – Share access and expand user eligibility of bike lockers, bike houses, and bike rooms.
3. **Quality Goal** – Increase quality and usability of parking by replacing lockers with multi-user lockers and non-standard bike racks with preferred bike rack types.

Long-Term Parking – Implementation Process

Lockers, Houses, Cages, and Rooms

- A. Review the Bicycle Parking Plan and UW Transportation Services annual utilization rates to understand parking stall need by zone.
- B. Conduct site visit and review data to recommend location(s) and facility type based on identified need and campus fit.
- C. Project Executive Committee and/or UW Design Review Board review and approve recommendation.
- D. Initiate appropriate project delivery method.

The long-term parking inventory will substantially increase with four new bike houses opening and replacement of broken lockers in 2023/early 2024. It is anticipated that the use of bike rooms in new development, renovation projects, and/or space found in existing buildings be utilized to the maximum extent feasible for secure parking without further effect on campus access and landscape.

Short-Term Parking – Implementation Process

Bike Racks

1. Eliminate unwanted racks
 - Eliminate all racks that do not meet standard
2. Rebalance existing capacity
 - Move around existing desirable racks to meet current demand
3. Measure demand
 - Conduct occupancy counts twice a year, in April/May and October/November
4. Add capacity where needed
 - Add new standard racks (staple) where needed to meet demand



Short-Term Parking

Bike Racks

Bike rack types to keep

- Staple
- Vertical
- Toast (TR or TST)

The preferred rack is the inverted U rack or Staple. Replace Toaster racks when possible.

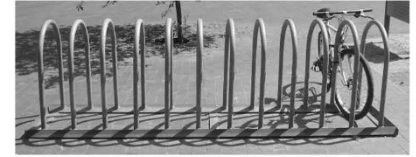
Staple = ST



Vertical = V



TST-13



TST-11



TST-8



TST-7



Short-Term Parking

Bike Racks

Remove underutilized racks.
Replace high demand areas with
new racks.

Bike rack types to
eliminate or replace:

- Custom
- DS (BB, CC & EE)
- Hanger
- Rack 3 = R3
- Railings
- Ribbon (wavy)
- Single Sided = SS

Rack3=R3



McMahon Railings



Single Sided=SS



Custom (Haggett)



Custom (Parking Services)



DS-BB



RB-11



DS-CC



DS-EE



RB-9



Hanger = HG



Long-Term Parking – Implementation Process

Lockers, Houses, Cages, and Rooms

1. Measure demand of bike houses

- Three new bike houses just opened in Sept. 2023 with 240 parking spaces
- The ratio of permits was just increased in Sept. 2023 to 1.75 users per space on all houses

2. Replace lockers with multi-use lockers

- Replacing non-working lockers would add new parking capacity and provide locker use data (through blue tooth)
- Replacing lockers with multi-user lockers would increase number of users and utilization throughout the week and month* and may reduce the number of lockers needed to meet demand



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* Bike Link sees an average of 5-6 users per locker in the Puget Sound area

Long-Term Parking – Implementation Process

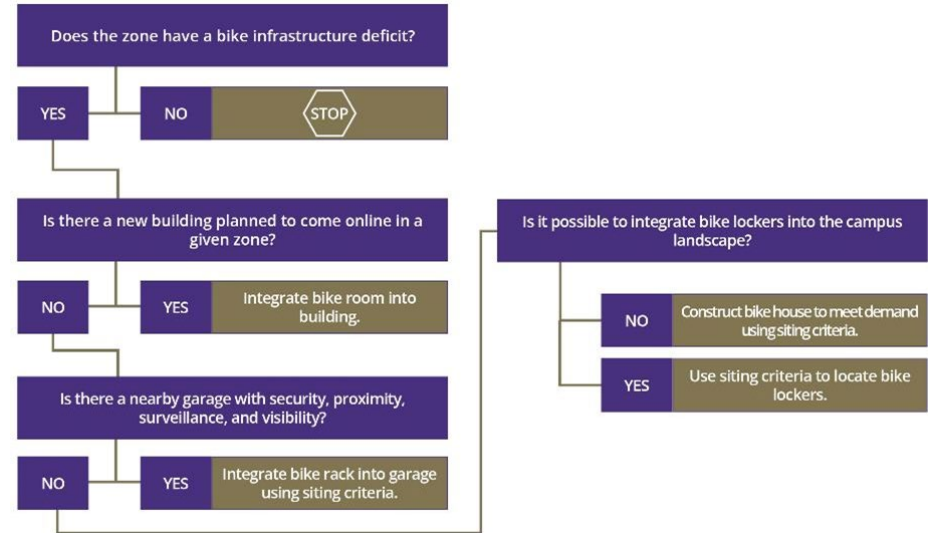
Lockers, Houses, Cages, and Rooms

3. Monitor use of houses and lockers

- Biannual or quarterly tracking of utilization
- Adjust number of house permits as needed
- Promote and market availability to increase awareness and utilization

4. Identify locations that need additional capacity

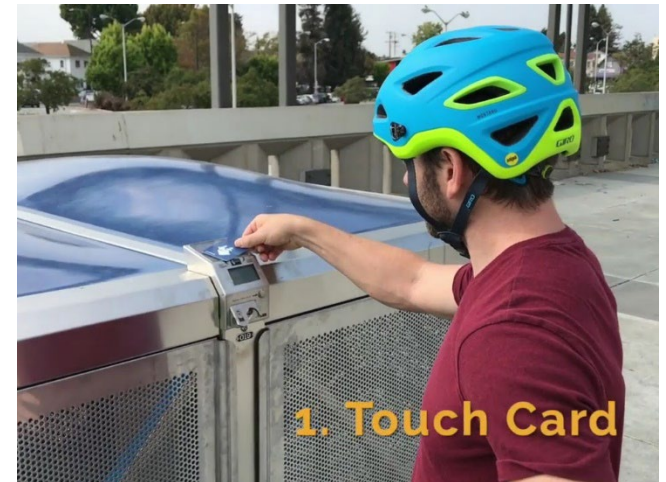
- First, determine whether a cage can be added in a nearby parking garage or as a bike room in a building.
- Second, whether needed capacity can be met with new lockers.
- Third, add a bike house if not possible to install new lockers or cage.



Utilization Targets

Bike Lockers

- **Current Utilization (May 2023)**
 - 36 locker sites with 610 spaces
 - Only 363 lockers are rentable = 60% of capacity
 - 192 lockers rented in May 2023
 - 53% of rentable capacity, 31% of total capacity
- **Target Utilization**
 - Replacing non-working units could add up to 247 lockers if all were replaced
 - Multi-user function would multiply number of possible users (as much as 5-6 per locker) and number of lockers needed may be lower (test)
 - Multi-user function would increase daily occupancy
 - Opportunity: Increase daily occupancy to 500 spaces
 - Target: 80% utilization for multi-user and 100% for single-use lockers across campus



Utilization Targets

Bike Houses

- **Current Utilization**

- 11 houses/cages with 463 spaces in May 2023
- 119 spaces occupied = 26% utilization
- 18-36% utilization. Cage under Hitchcock at 50%
- 3 new houses with 241 spaces opened Fall 2023
- 704 total spaces across 14 houses
- 1.75 permit to space ratio = 1,228 permit sales

- **Target Utilization**

- Opportunity: Increase daily occupancy by 375 spaces
- Target: 70% utilization across campus
- It may require increasing permit sales ratio



Utilization Targets

Bike Rooms (managed by building unit)

- **Current utilization**
 - 15 rooms/cages with 390 spaces
 - 166 spaces occupied = 43% utilization
 - Some small rooms over 100% capacity
 - Most rooms at 50%
 - Largest opportunity at Rosling Center and Gates with 56 of 196 spaces occupied (28%)
- **Target utilization**
 - Share capacity of the largest rooms (Rosling Center, Gates, and Allen)
 - Opportunity: Increase daily utilization by 100 spaces
 - Target: 70% utilization across building sites



UW Bicycle Parking Monitoring and Management

Management Goals:

- Increase utilization of bike parking resources, with the goal of approaching 100% year-round subscription to single use bike lockers and 85% peak utilization of any future on-demand bike lockers.
- Increase customer awareness of the bike house system with the goal of achieving a ratio of 0.85 permits sold per available parking space within the specific bike house.
- Maintain and improve Transportation Services' (TS) leveraging of bicycle parking as a Transportation Demand Management strategy to encourage mode shift from single occupancy vehicle to bicycle commuting.
- Employ industry best practices and continue standard-setting bike parking and overall TDM programs.
- Ensure a consistent cadence of coordination as

Management Program Functions:

- **Asset Management:** Maintenance and tracking of inventory; continuous improvement of parking facilities
- **Demand Management:** Utilization counts, demand analysis, adjustment of sales ratios, waitlist clearance, analysis of parking patterns and behavior
- **Customer Engagement:** Ensure information about all aspects of bicycling at UW is readily available and easily accessible on the TS website; ensure that questions not covered by online information are readily answered by TS staff

UW Bicycle Parking Monitoring and Management (cont.)

Asset Management:

- Manage removal and replacement of obsolete or damaged bike racks and lockers while ensuring prompt replacement with state-of-the-art and reliable facilities.
- Research opportunities to refurbish, recycle, or resell older models of bike lockers and bike racks as newer models are installed.
- Document known issues with parking models and designs; ensure that any fix of an issue is applied system-wide.
- Study approaches taken by peer institutions on secure bike parking to enhance our approach.

Demand Management:

- Conduct periodic utilization counts of all bike types to track demand & usage patterns
- Conduct Bike House utilization counts periodically
- Conduct Bike Rack utilization counts, using a sample, periodically
- Track bicycle types and usage patterns in above counts
- Concurrent with quarterly utilization checks, assess the extent to which current rates for lockers and bike houses impact demand. Consider implementation of policies such as seasonal rates that vary with demand to increase utilization of facilities
- Periodically assess external policy developments that may increase bike use, such as the expansion of citywide protected bike lanes or the Washington Rebate
- Periodically assess campus demand for new facilities

UW Bicycle Parking Monitoring and Management (cont.)



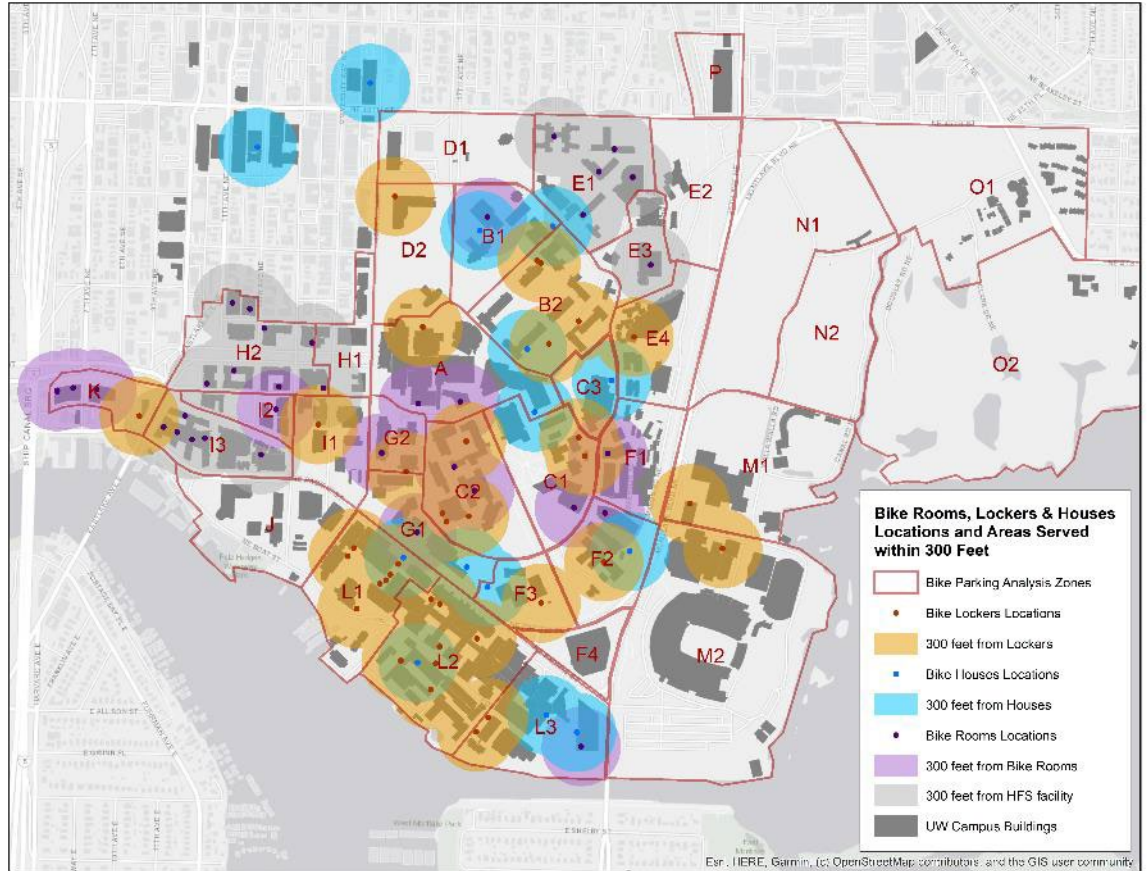
Customer Engagement:

- Continue to ensure that all customer inquiries and issues are addressed promptly
- Ensure Secure Bike Parking Map on TS website is up to date; consider including future bike houses to generate interest in advance of opening
- Streamline the Bike Locker purchasing process by ensuring that customers can view the number of available lockers and waitlist length for areas of interest
- Establish standards for monthly and annual evaluation of waitlists
- Explore the possibility of leveraging customer contact information from secure bike parking lists for surveying or other research strategies to gain insight into commute behavior
- Develop new marketing channels for secure bike parking

Bike Parking Siting Criteria



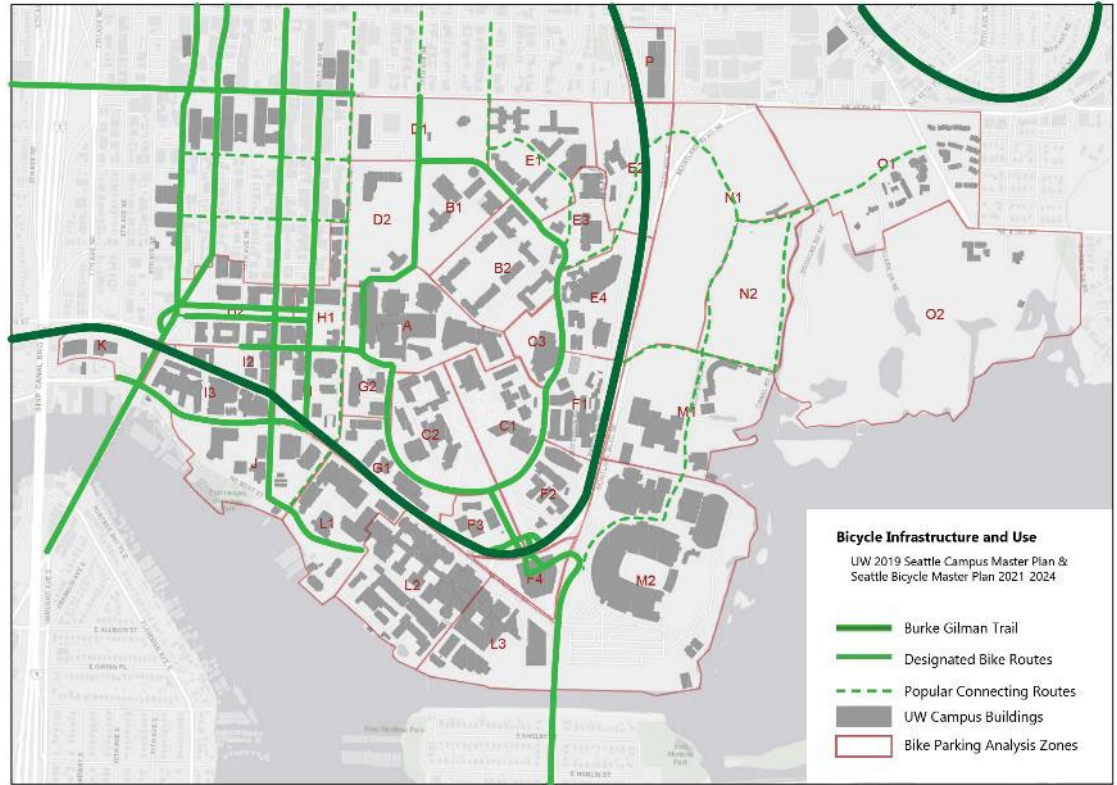
Bike Parking Coverage



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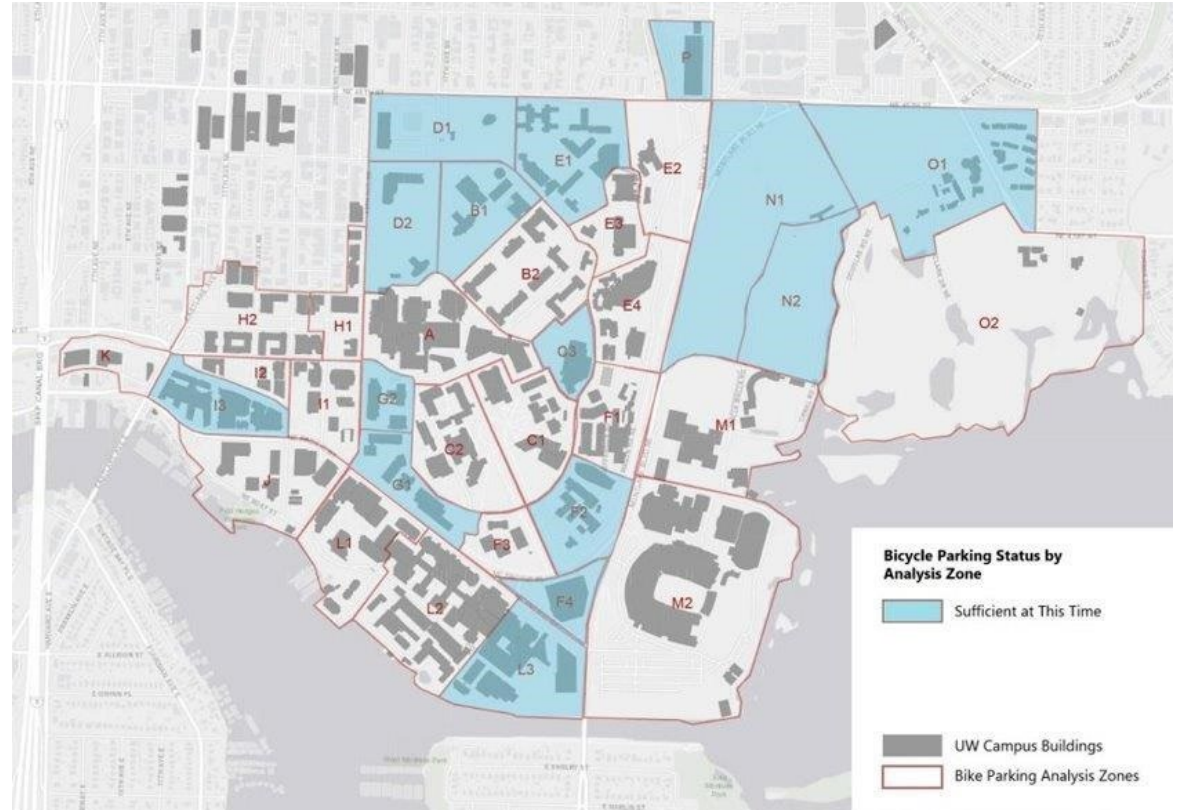
Preferred Bicycle Routes

- Access routes and hierarchies
- Changing environment in U-District
- Housing affordability



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Sufficient Bike Parking



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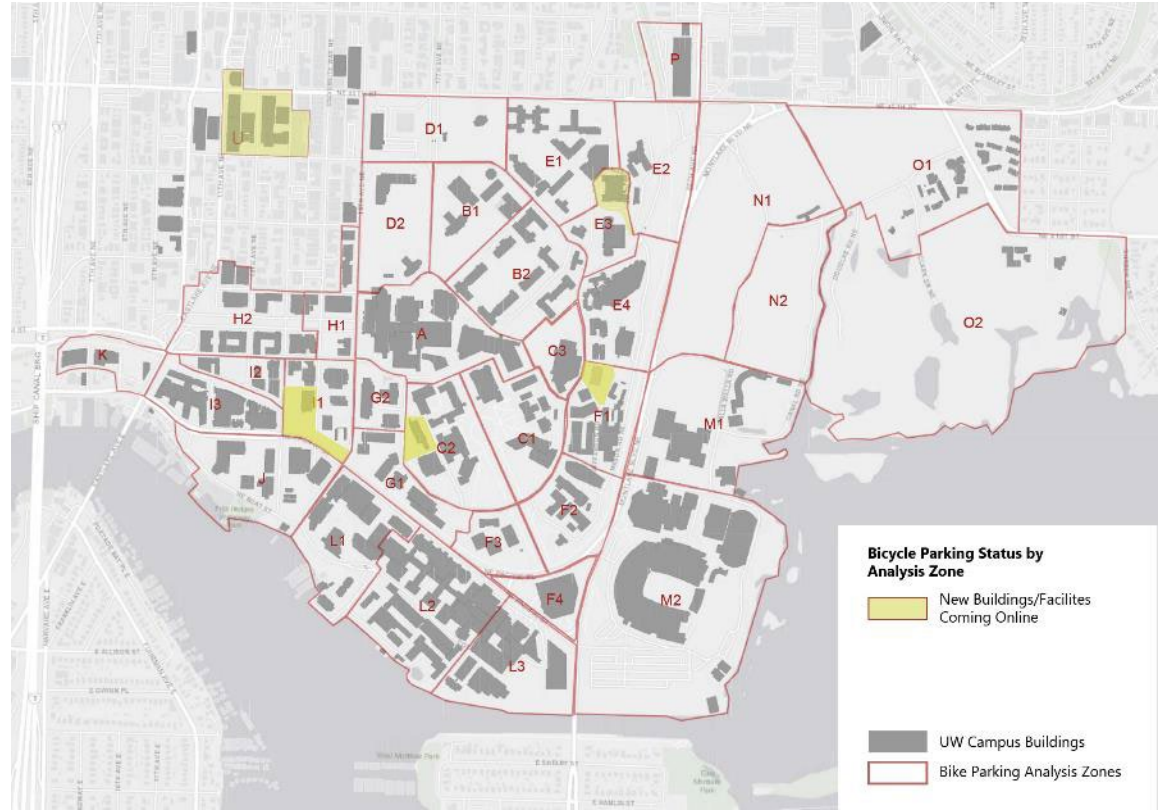
New Facilities in Planning

Under Construction:

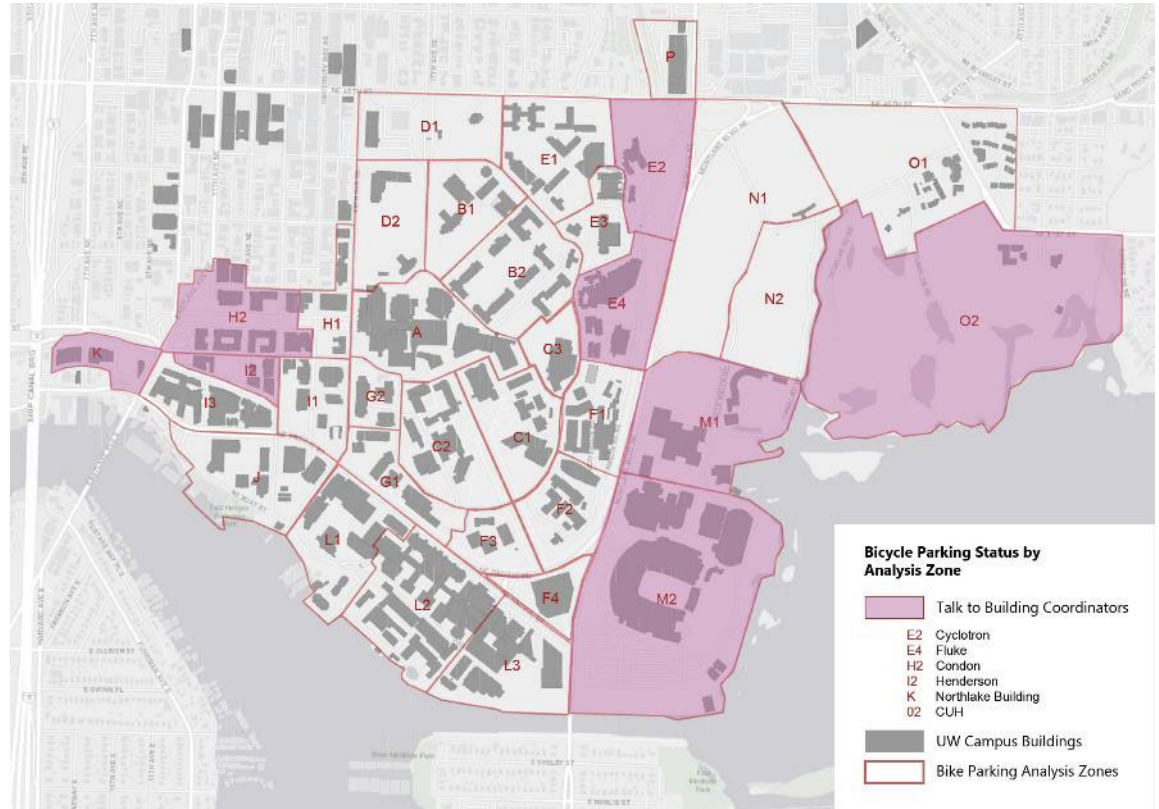
- IEB
- UDSB

In Planning:

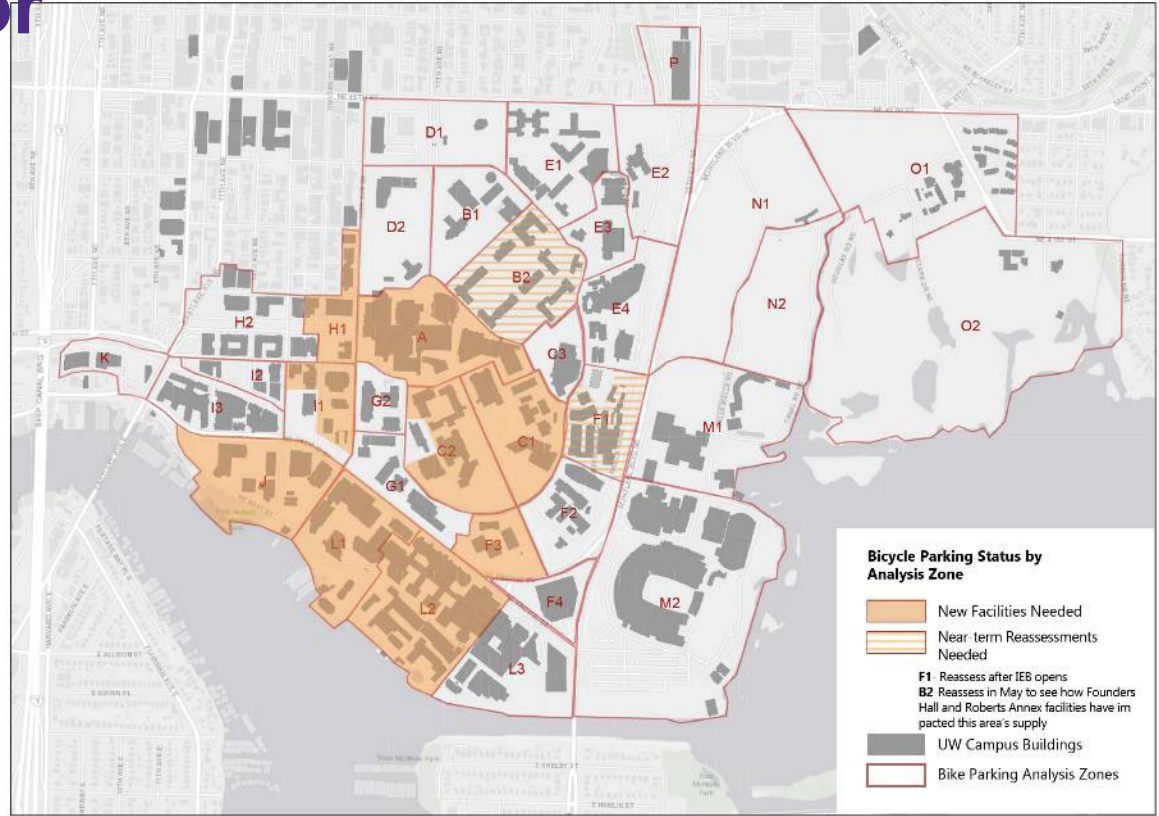
- Site W27
- Haggett
- Chemistry



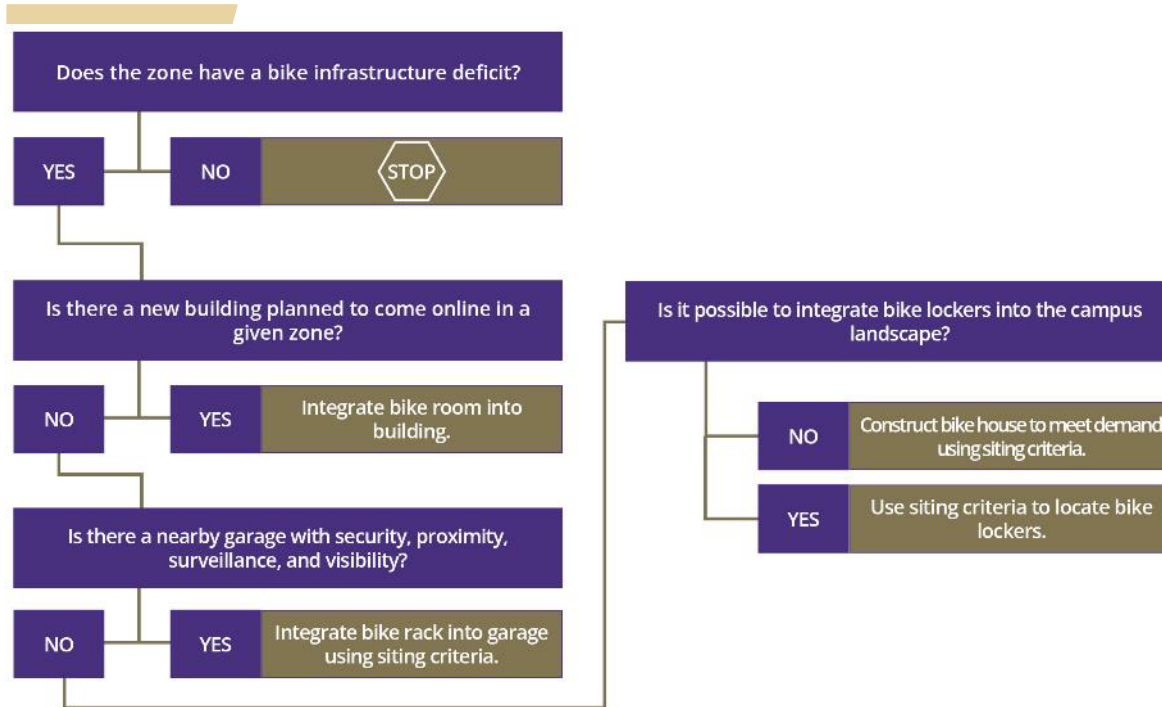
Discuss Needs w/Building Coordinators



Focus Zones for New Facilities



Bike Infrastructure Decision Tree



Siting Criteria

All Bike Parking Types

- Universally accessible
- Along frequently traveled corridors/building entries
- Outside of key campus vistas and views
- Proximate to bicycle routes of travel
- Asphalt adjacent
- Does not remove trees
- Undeveloped site

Selection Considerations

Bike Lockers and Bike Houses

- Size and footprint
- Bicycle capacity
- Cost per bicycle parking space
- Access (physical key, keycard, Bluetooth or app-based)
- Location or campus fit (campus area, landscape, surrounding buildings)



Suggested Locations



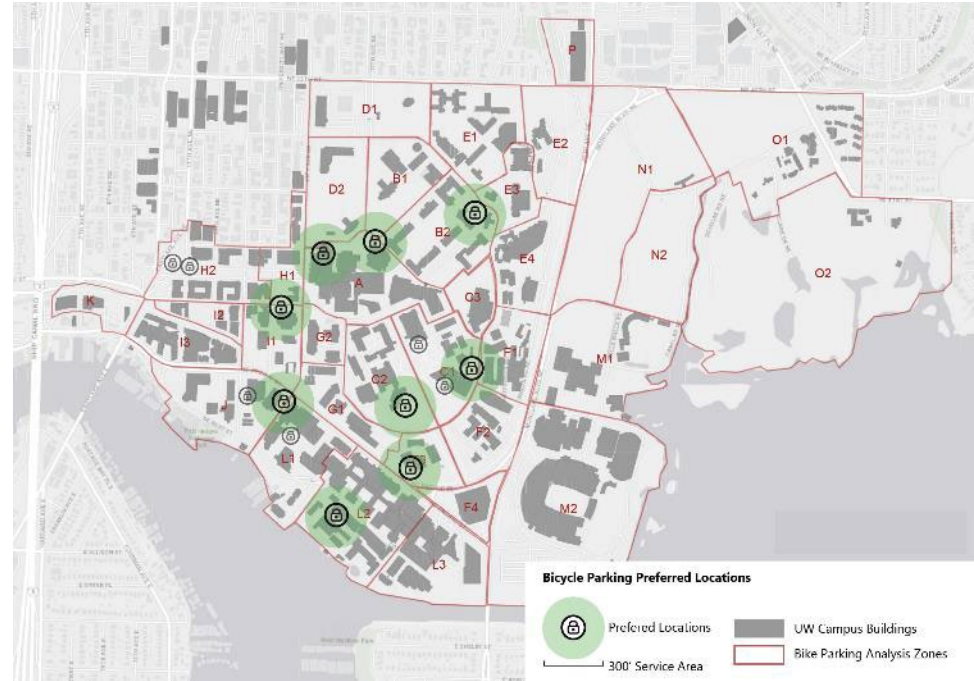
Zone A
Kane Hall and Spokane Way
New Bike House or Lockers



Zone A
Central Parking Garage
Bike Cage



Zone I1
Under Gould Hall Ped. Bridge
New Bike Cage



Suggested Locations



Zone B2*
Across from Lewis Hall
New Bike House or Lockers

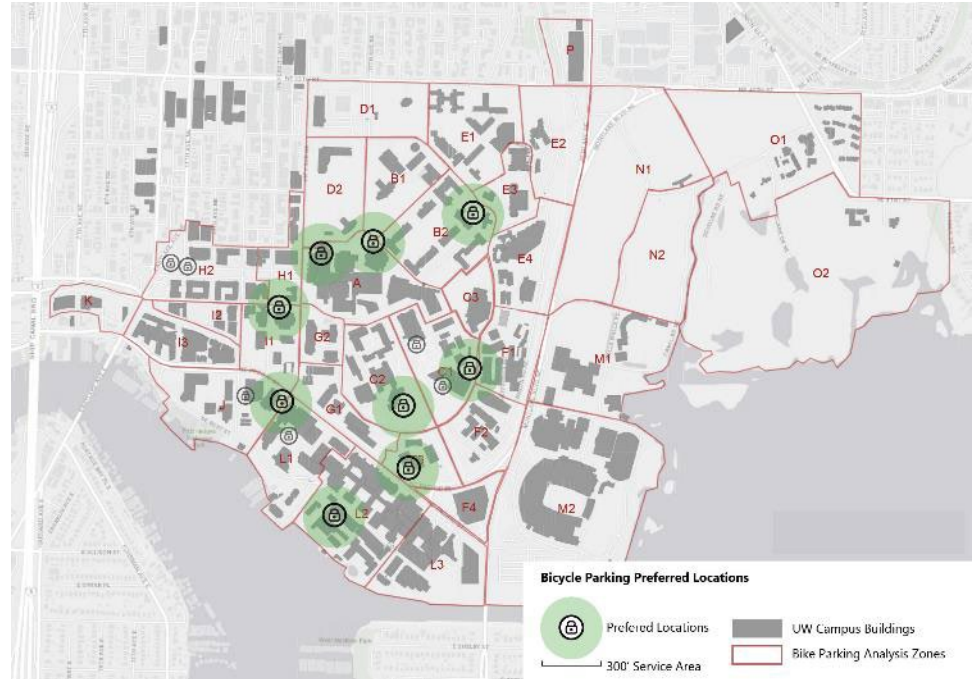


Zone C1
Stevens Way at Allen Hall
New Bike Room



Zone C2
Chemistry Building
New Bike Lockers

**Reassess in May*



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Suggested Locations



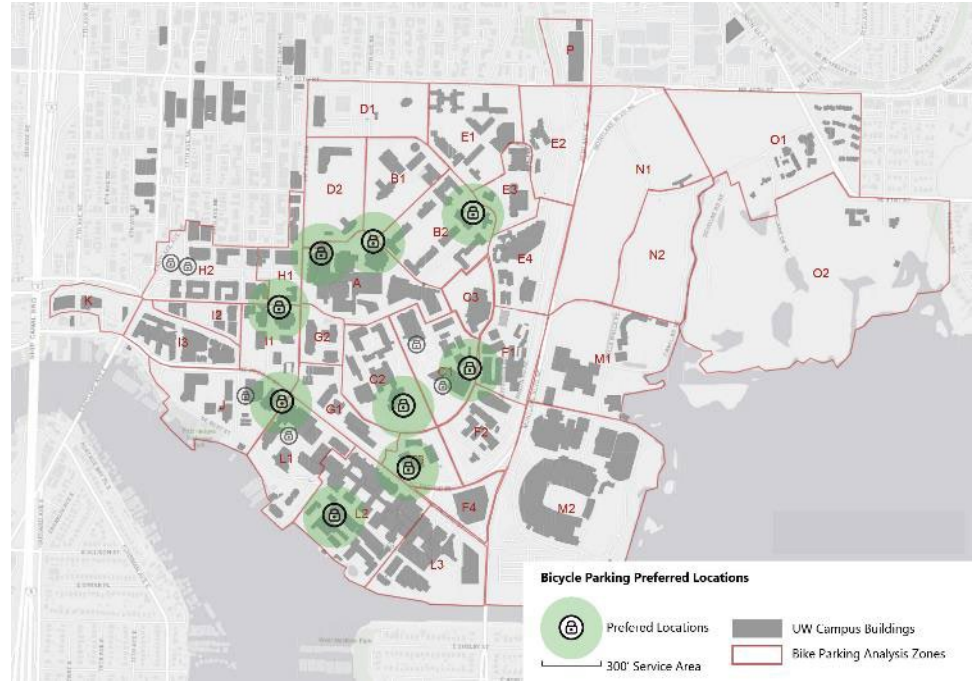
Zone F3
Bloedel Hall
Bike Lockers



Zone J
Portage Bay Garage
New Bike Cage



Zone L2
Above Central Parking Garage
Upgrade Lockers or Bike House



Design Standards

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Short-Term Parking

Bike Racks

SportWorks

- Tofino No Scratch Bike Rack (“staple”)



Long-Term Parking

Bike Lockers

(pending UW research)

- Contact references
- Case studies
- Request samples to test hardware
- Test operating and reporting dashboards
- Vendor education sessions



Long-Term Parking

Bike Houses/Cages

Prefabricated Duo-Gard building, Cambridge style, containing:

- A bench for changing shoes
- Metal lockers
- Two entry/exit doors
- 120V outlets for electric bike parking



UW Bike House Detailed Design Standards

- Design Criteria:
 - Ground Snow Load: 25 PSF
 - Roof Live Load: 20 PSF
 - Maximum Drift Load: 5 PSF
 - Wind Load: 110 MPH
- Prefabricated Duo-gard building, Cambridge, containing:
 - A bench for changing clothes
 - Metal lockers
 - Two doors
 - 120V outlets for electric bike parking
- Structural members shall be anodized and colored “Dark Bronze”
- 1/8” thick perforated anodized aluminum walls/screening colored “Dark Bronze”. Pattern shall be 1/4” diameter holes on staggered 3/8” centers.
- Roof shall be constructed of a 20 mm polycarbonate batten system attached with aluminum clips
- Accessible door shall be heavy duty ADA closer 42” x 84”
- Shall have a custom UW logo on the facade.
- Accessed via key card/electric strike
- Concrete slab on grade
- Lighting shall use the following or approved equals:
 - LED Waterproof Wall Pak from ESLVISION. 4000K temperature
 - LED Waterproof Tape Light from NOVA FLEX LED in aluminum channel, IP68, 4100K temperature. Use 288W 0-10V Driver. Provide motion sensor
- Stormwater: discharge to a non-infiltrating bioretention planter or similar.

Long-Term Parking

In-Building Bike Rooms

- Available to a broader campus community
- Secured via code or card
- Available charging outlets
- Benches
- Accessible and inclusive bike racks
- Lockers
- Adjacent to showers and changing facilities
- Tool station

Example UW Bike Lockers & Bike Houses

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Roberts Annex Bike House (2023)



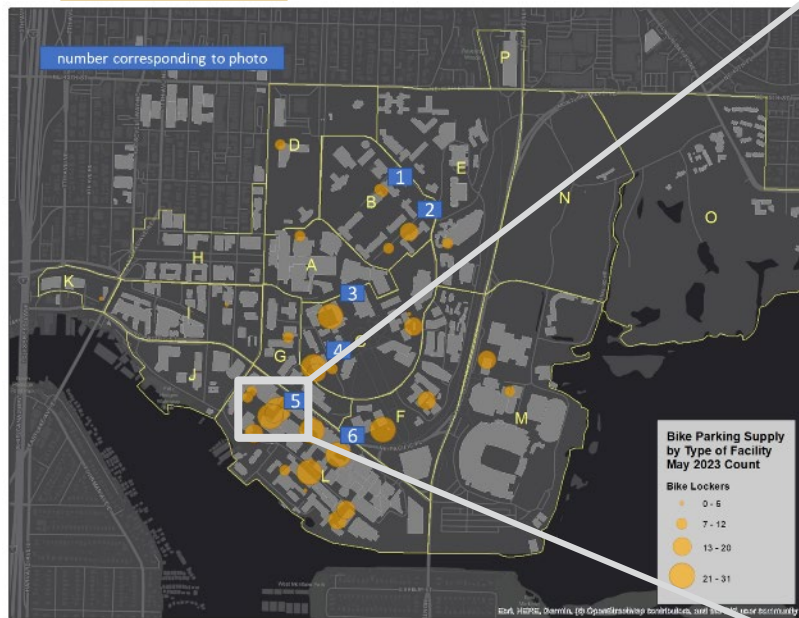
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T-Wing Bike House



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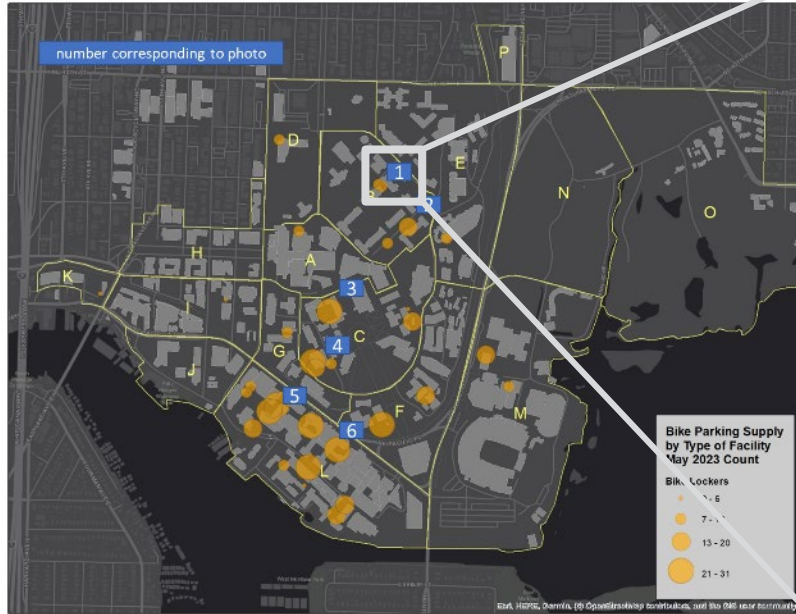
Hitchcock Bridge Bike Lockers



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Raitt Hall

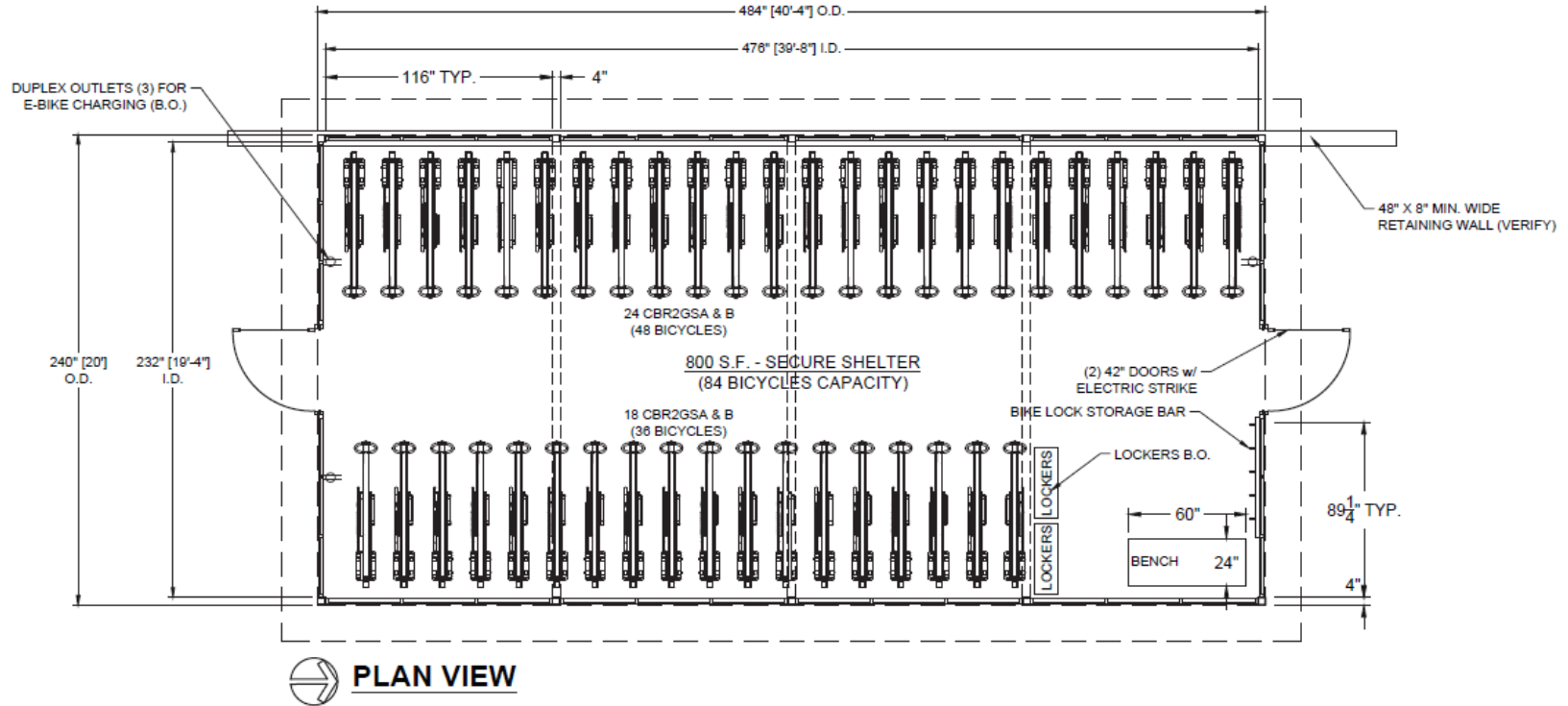
Bike Lockers



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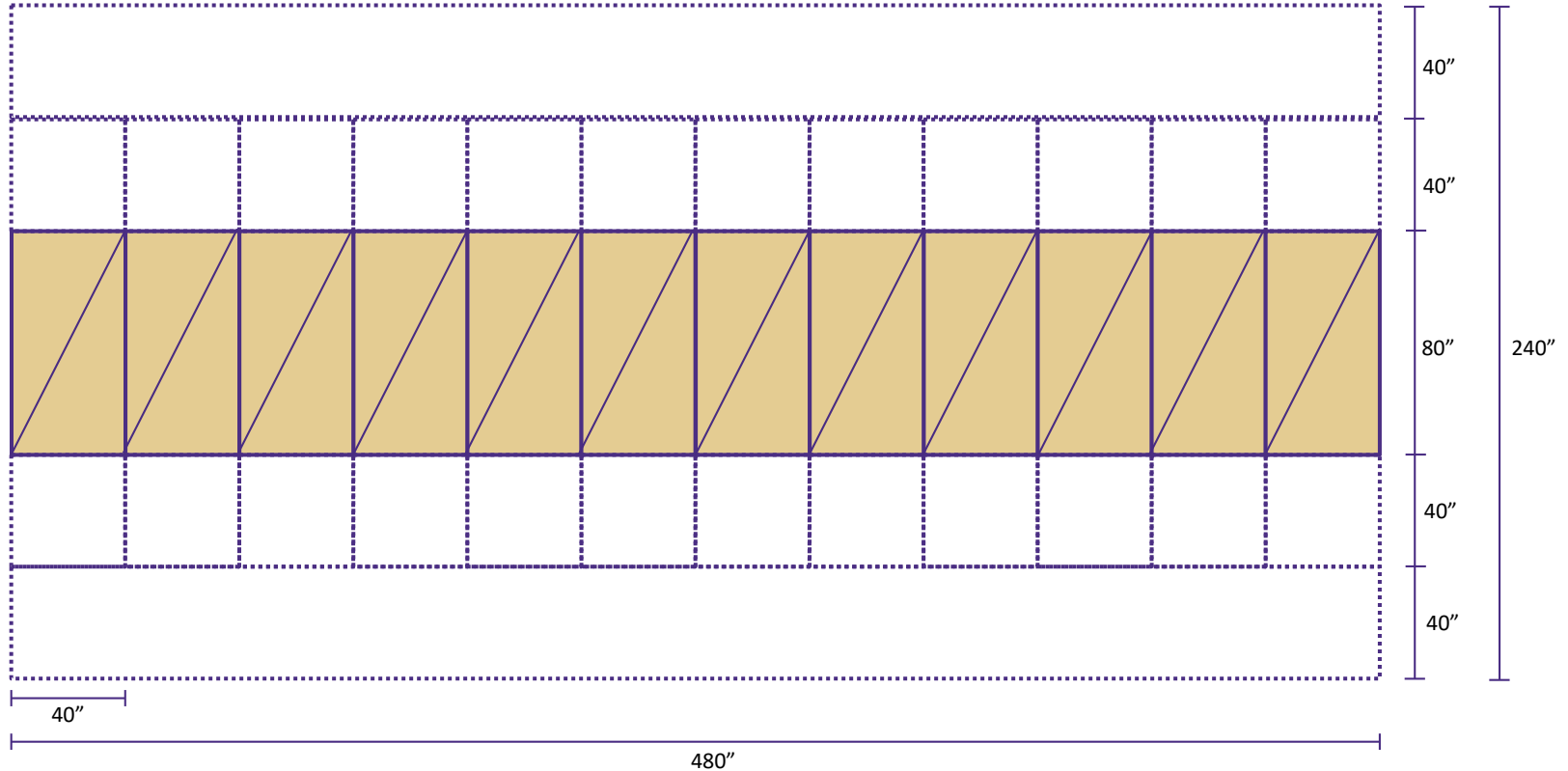
UW Roberts Annex Bike House

Capacity: 84 bicycles | 800 sq. ft.



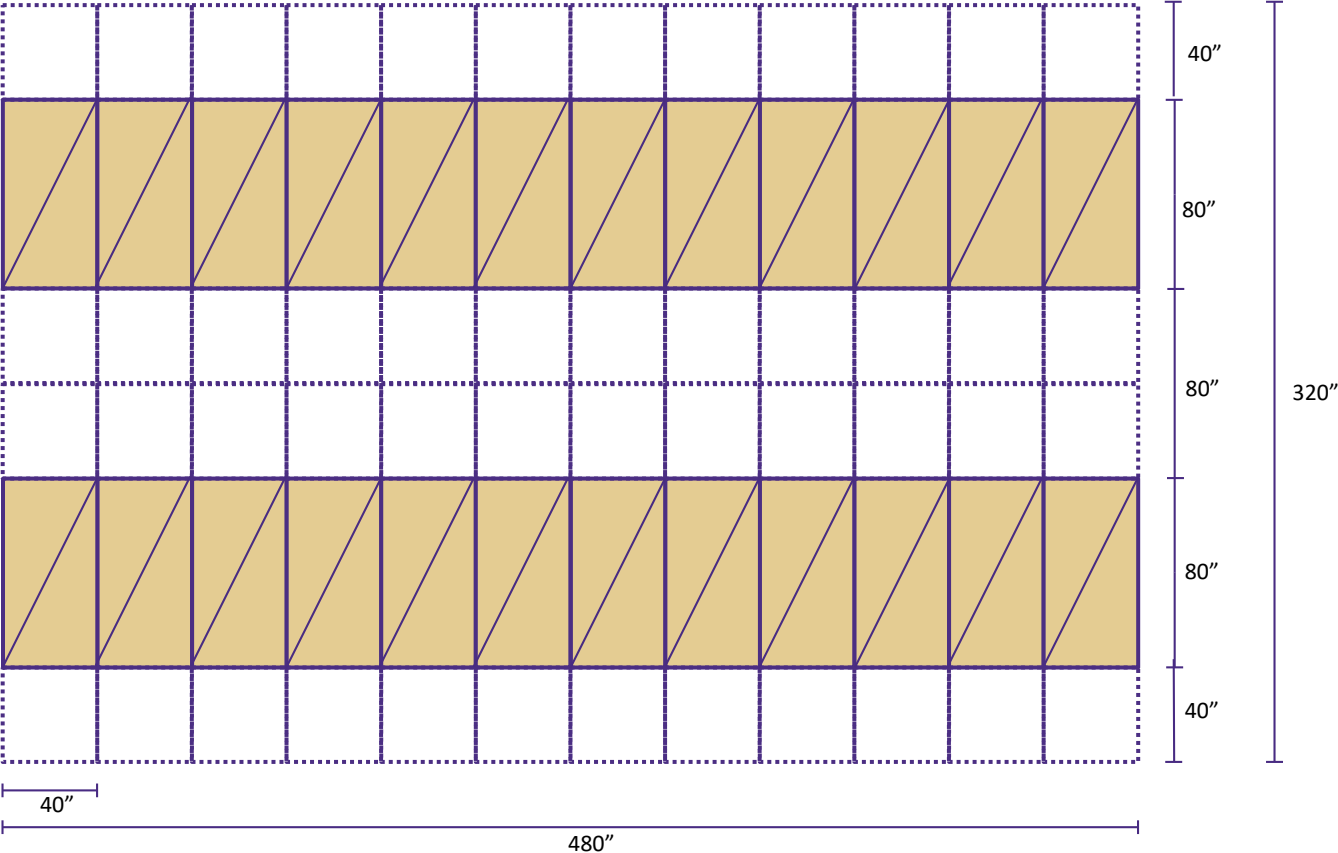
Locker Configuration #1: one row of 24 stacked 80"X 40" lockers

Capacity: 48 bicycles | 533 sq. ft.



Locker Configuration #2: two rows of 12 unstacked 80"X 40" lockers

Capacity: 48 bicycles | 1,067 sq. ft.



Configuration Summary

Measurement	Roberts Annex Bike House	Locker Configuration 1	Locker Configuration 2
Width (in)	240	160	320
Length (in)	480	480	480
Square inches	115,200	76,800	153,600
Square feet	800	533	1,067
Bike Capacity	84	48	48
Square ft. per bike	9.5	11.1	22.2
% of Bike House space	100%	67%	133%