



APPENDIX A: UCSF BICYCLE/ MICRMOBILITY FACILITY STANDARDS

July 2022



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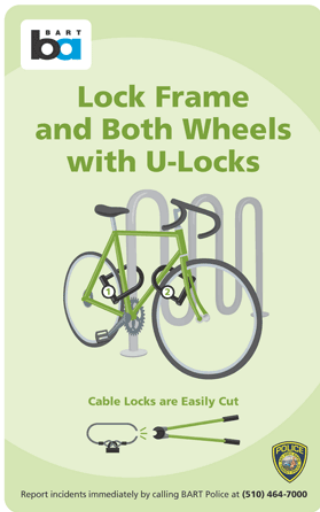
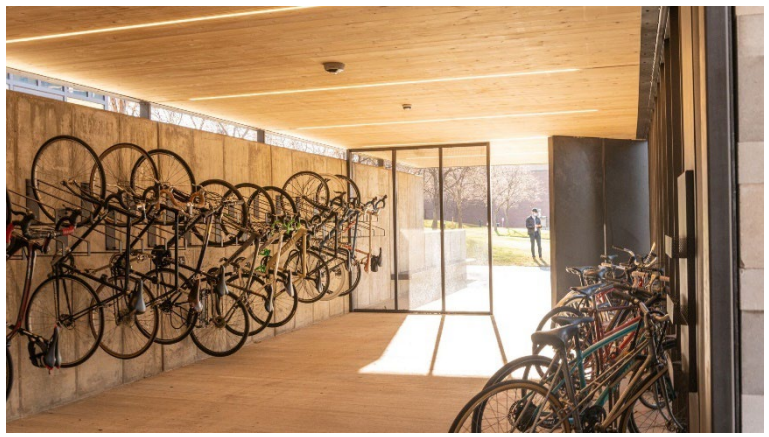
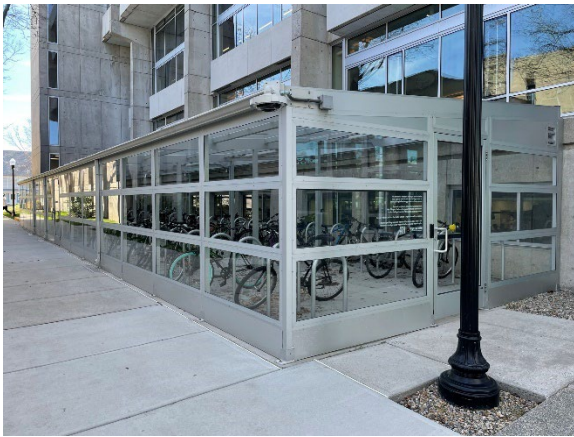
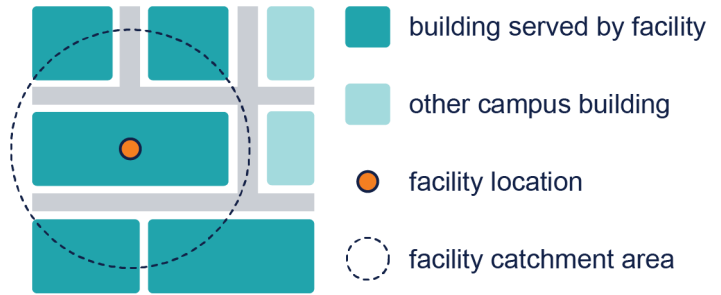
These bicycle/micromobility facility standards have been prepared to help UCSF apply a reasoned, consistent, and institutionalized approach to accommodating existing and growing bike and micromobility needs on campus. These standards should be utilized for all new construction and retrofits. The standards contained within this document were developed based on UCSF's campus characteristics, use patterns, local and national best practices, engagement with UCSF stakeholders, and University-wide sustainable transportation goals. Standards for both bicycle/micromobility parking and end-of-trip amenities such as showers, personal lockers, and repair stands are covered in this guide.

BICYCLE/MICROMOBILITY FACILITY TYPES

With a wide range of learners, staff, faculty, patients, and visitors traveling to and from UCSF each day, the proposed campus standards embrace a mix of bicycle/micromobility facility types and locations according to each campus site's characteristics. Four key bicycle/micromobility facility types were developed for UCSF to meet the range of needs on campus. These facility types cover both access-restricted facilities that serve UCSF badge holders in higher-security locations and publicly-accessible facilities that serve the broader public. A combination of both are required at all campus buildings at UCSF.

ACTIVE COMMUTER HUBS

Active Commuter Hubs provide a one-stop shop for long-term bike and micromobility commuters at UCSF. As a resource that is accessible to all badge holders, Active Commuter Hubs are distributed around campus to provide convenient, secure, and well-appointed facilities for people who will be on campus for several hours or more. Active Commuter Hubs may be located within parking structures, free-standing structures, or in buildings that have exterior access.



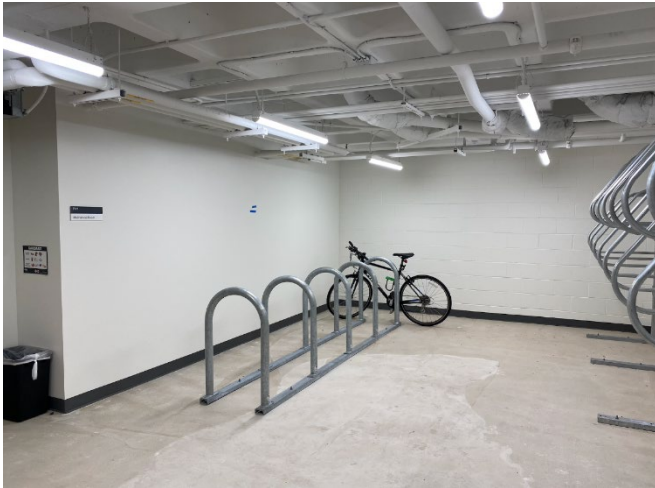
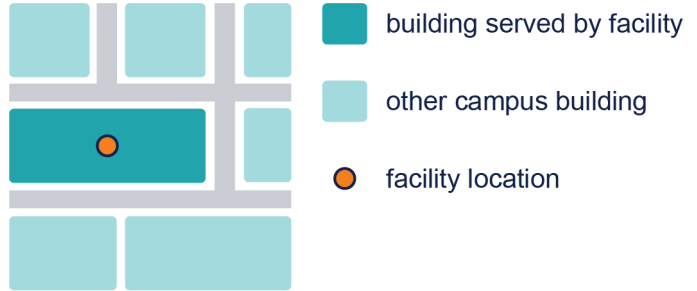
FACILITY DETAILS/CHECKLIST

- | | |
|----------------|--|
| Intended Users | <ul style="list-style-type: none"> • UCSF badge holders without access to Building Bike Rooms |
| Length of Stay | <ul style="list-style-type: none"> • Medium-Term (2-6 hours) • Long-Term (6+ hours) • Overnight |

- Location Features
 - Exterior access provided
 - Located on ground floor
 - Ideally located within view of a permanent attendant or UCSF staff
- Security Features:
 - Secure rack styles
 - Pre-approved badge access
 - Conspicuous closed circuit video signage
 - Extra bright lighting
 - Enclosed within durable, tamper-proof exterior materials
- Priority Amenities:
 - Lock docks to accommodate at least 25% of total supply
 - Personal lockers to accommodate at least 25% of total supply (unless located within building with additional shower/locker facilities)
 - At least 5% of total parking supply spaced extra wide (to accommodate bikes at least 8.5 feet long)
 - Fix-it stand and floor-mounted bike pump
 - Bench (for enclosures with greater than 100 spaces)
 - Intermittent and signed outlets for e-bike charging
 - High-visibility, exterior branded signage
 - Clear on-site wayfinding to/from enclosure, especially when shared with motor vehicles
 - On-site educational signage and resources
- Optional Amenities:
 - Bench (for enclosures with less than 100 spaces)
 - Bike parts vending machine

BUILDING BIKE ROOMS

Building Bike Rooms provide secure, long-term bike parking for specific building populations. These locations are access-restricted to people who use a specific building on a regular, long-term basis. These locations may be co-located with end-of-trip amenities.



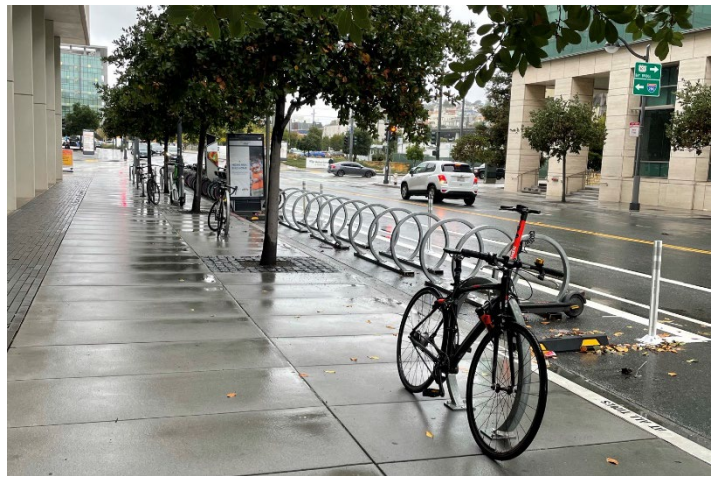
FACILITY DETAILS/CHECKLIST

- | | |
|-------------------|--|
| Intended Users | <ul style="list-style-type: none"> • UCSF badge holders within specific buildings |
| Length of Stay | <ul style="list-style-type: none"> • Medium-Term (2-6 hours) • Long-Term (6+ hours) • Overnight |
| Location Features | <ul style="list-style-type: none"> • Located on ground floor; If ground floor not possible, runnels and wayfinding to elevators and bike room must be provided. |

- Ideally located within view of a permanent attendant or UCSF staff
- Security Features:
- Secure rack styles
 - Pre-approved and location-restricted badge access
 - Conspicuous closed circuit video
- Priority Amenities:
- Lock docks to accommodate at least 25% of total supply
 - Personal lockers to accommodate at least 10% of total supply (unless located within building with additional locker facilities or a housing building)
 - At least 5% of total parking supply spaced extra wide (to accommodate bikes at least 8.5 feet long)
 - Fix-it stand and floor-mounted bike pump
 - Intermittent and signed outlets for e-bike charging
 - On-site educational signage and resources
 - Access to showers/lockers within building
- Optional Amenities:
- Bench
 - Bike parts vending machine

MOBILITY NODES

Mobility Nodes provide a concentrated supply of bike/micromobility parking within high-foot traffic areas and close to UCSF activity centers. These locations are highly convenient for a large range of users, mostly rely on foot traffic to self-enforce security, and may be co-located with weather-resistant end-of-trip amenities. These locations are well-suited within close proximity of other transportation facilities, such as shuttle/transit stops and bikeshare stations. Mobility nodes may serve just one building or a cluster of buildings if primary entrances to the buildings are proximate.



FACILITY DETAILS/CHECKLIST

- | | |
|-------------------|---|
| Intended Users | <ul style="list-style-type: none"> • All |
| Length of Stay | <ul style="list-style-type: none"> • Short-Term (0-2 hours) • Medium-Term (2-6 hours) |
| Location Features | <ul style="list-style-type: none"> • Located within high foot traffic areas |

- Located within 200 feet of major UCSF activity centers
- Ideally co-located with other mobility amenities, such as shuttle/transit stops and bikeshare stations

Security Features:

- Secure rack styles
- Natural surveillance within high-foot traffic areas

Priority Amenities:

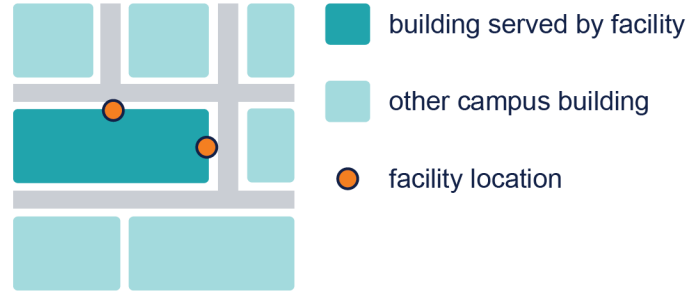
- Weather protection via shelter or building overhang for 25% of total supply (for Nodes with greater than 40 spaces)
- Fix-it stand and ground-mounted bike pump
- Free-standing or shelter-mounted educational resources

Optional Amenities:

- Weather protection via shelter or building overhang (for Nodes with less than 40 spaces)

VISITOR SPACES

Visitor Spaces provide a place within 50 feet of all major building entrances for a person to secure their personal bike/micromobility device. Visitor spaces include parking locations within the public right-of-way. If multiple public entrances serve the same building, visitor spaces should be distributed and provided across entrances.



FACILITY DETAILS/CHECKLIST

- | | |
|--------------------|--|
| Intended Users | <ul style="list-style-type: none">• All |
| Length of Stay | <ul style="list-style-type: none">• Short-Term (0-2 hours)• Medium-Term (2-6 hours) |
| Location Features | <ul style="list-style-type: none">• Located within 50 feet of all major building entrances |
| Security Features: | <ul style="list-style-type: none">• Secure rack styles |

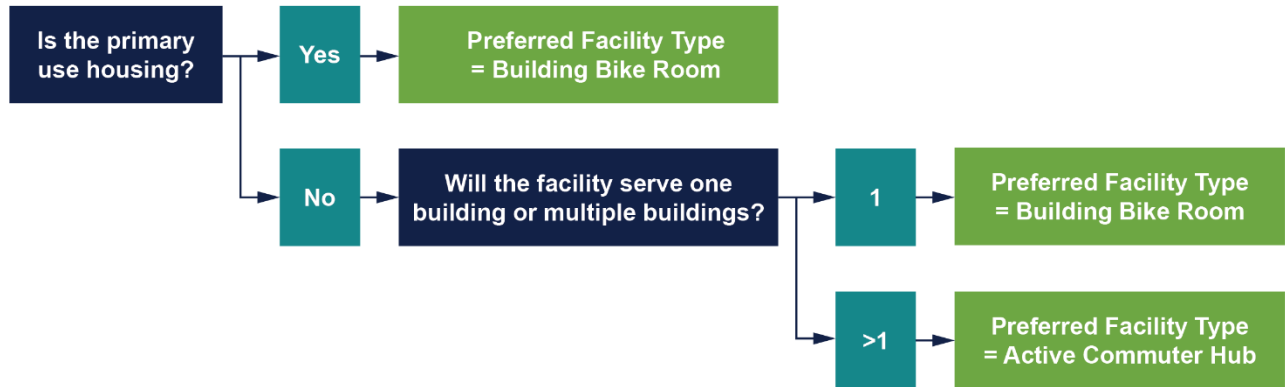
SUPPLY AND PROCESS GUIDANCE

A process for determining what facility types and the supply that should be provided is described below. Supply standards were developed based on each campus' population characteristics, existing and projected rates of biking and micromobility, plans for new building construction, and local and national best practices. The supply standards are provided on a per-person basis. Because some facility types (like Active Commuter Hubs) are campus resources and other (like Building Bike Rooms) are building-specific resources, new building projects and retrofits should first identify the population that will be served by each facility before determining the targeted supply.

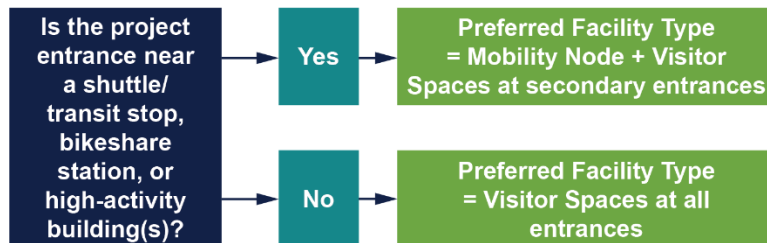
PROCESS FOR DETERMINING SUPPLY

A plan for providing both access-restricted and publicly-accessible bicycle and micromobility facilities should be considered from the outset of all new building and retrofit projects. Project teams should work closely with Campus Planning to establish the preferred approach and ideal facility types for each project. Depending on the characteristics of each project, different supply standards should be applied.

STEP 1: DETERMINE APPROACH TO ACCESS-RESTRICTED BICYCLE/MICROMOBILITY FACILITIES



STEP 2: DETERMINE APPROACH TO PUBLICLY ACCESSIBLE BIKE/MICROMOBILITY FACILITIES



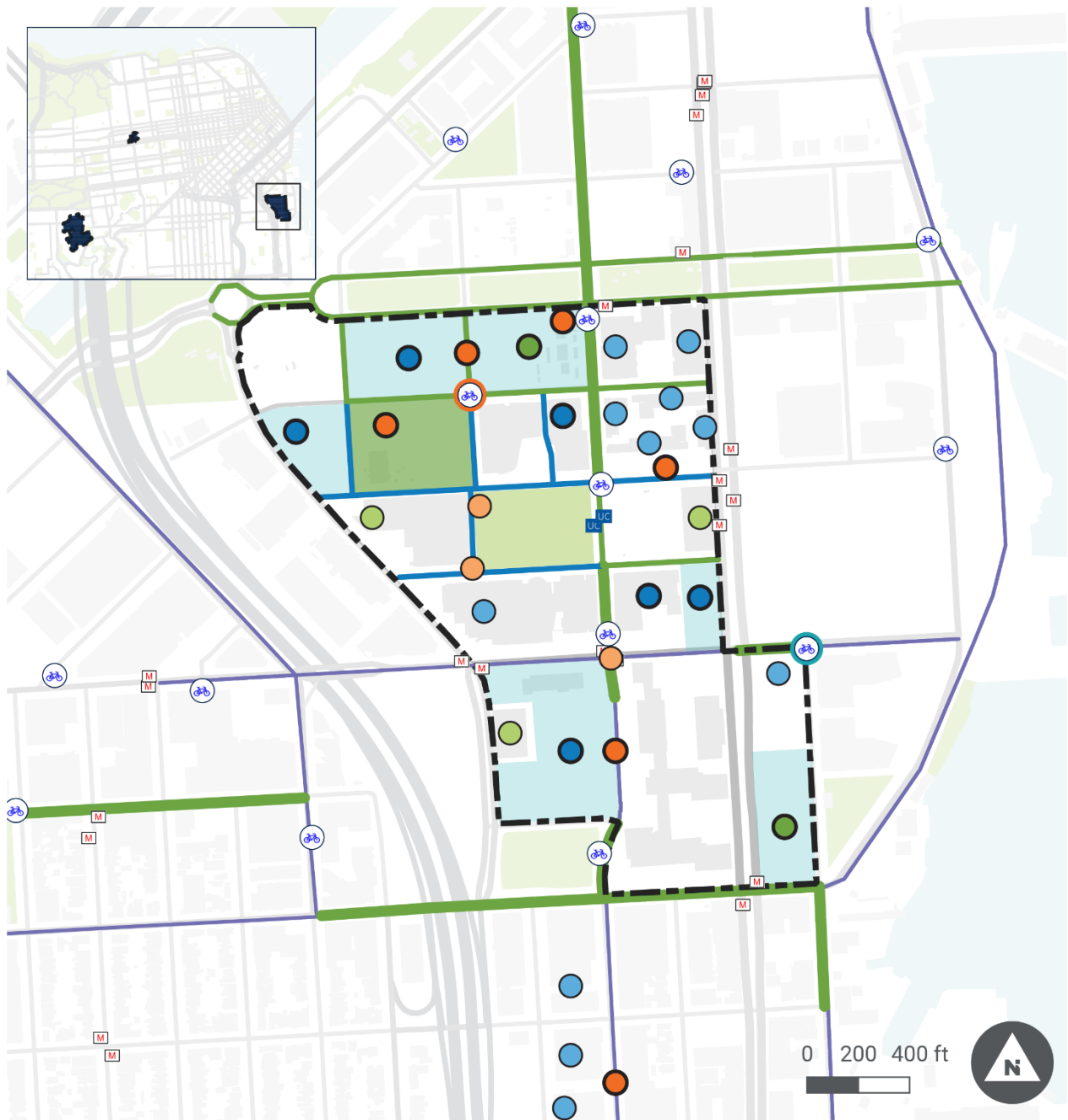
STEP 3: APPLY UCSF SUPPLY STANDARDS

Supply standards for UCSF were developed based on current and projected populations and rates of biking and scooter use across UCSF. In addition, local and national best practices (including LEED) were consulted.

Access-Restricted				Publicly-Accessible					
		Active Commuter Hub		Building Bike Room		Mobility Node		Visitor Spaces	
Population Served		Campus Population: Serves buildings within a 1,000 foot radius not including those with Building Bike Rooms		Building Population: Serves expected daily population of regular building occupants (badge holders only)		Campus Population: Serves buildings with entrances within 200 feet (including all regular building occupants and visitors)		Building Population: Serves expected daily population (including all regular building occupants and visitors)	
Acceptable Rack Types	U Rack/Hoop	X		X		X		X	
	Vertical	X		X					
	Two Tier w/assist	X		X					
		Housing	All Other Uses	Housing	All Other Uses	Housing	All Other Uses	Housing	All Other Uses
Supply Guidance	Mission Bay	N/A	1 space per 40 people	1 space per 3 people	1 space per 16 people	1 space per 14 people	1 space per 33 people	1 space per 14 people	1 space per 33 people
	Mount Zion	N/A			1 space per 20 people	1 space per 12 people		1 space per 12 people	
	Parnassus Heights	N/A			1 space per 20 people	1 space per 12 people		1 space per 12 people	
Notes		<ul style="list-style-type: none"> At least 25% of total supply to be ground-mounted At least 5% of total supply spaced extra wide Provide 1 personal locker per 4 parking spaces Provide 1 lock dock per 4 parking spaces 		<ul style="list-style-type: none"> At least 25% of total supply to be ground-mounted At least 5% of total supply spaced extra wide Provide 1 personal locker per 10 parking spaces Provide 1 lock dock per 4 parking spaces Provide 1 shower on site per 100 people (non-housing) 		<ul style="list-style-type: none"> Depending on site characteristics, supply requirements may be split across a Mobility Node and Visitor Spaces at public entrances. In all cases, no fewer than 4 spaces should be provided at all public entrances. Where >40 spaces are provided, at least 25% to be covered/sheltered 			

BIKE/MICROMOBILITY FACILITY RECOMMENDATIONS

Using the standards above, location-specific bike/micromobility parking recommendations were developed for each campus. These recommendations were based on existing conditions and may need to be revisited as the campus evolves. In addition to modifying the existing supply to respond to actual demand and UCSF community feedback, locations for future bike parking facilities were identified based on where building investments at each campus will create natural opportunities to provide new amenities.



Base Information

- Existing High-comfort Bikeway
- Mission Bay Campus Boundary

Future Development

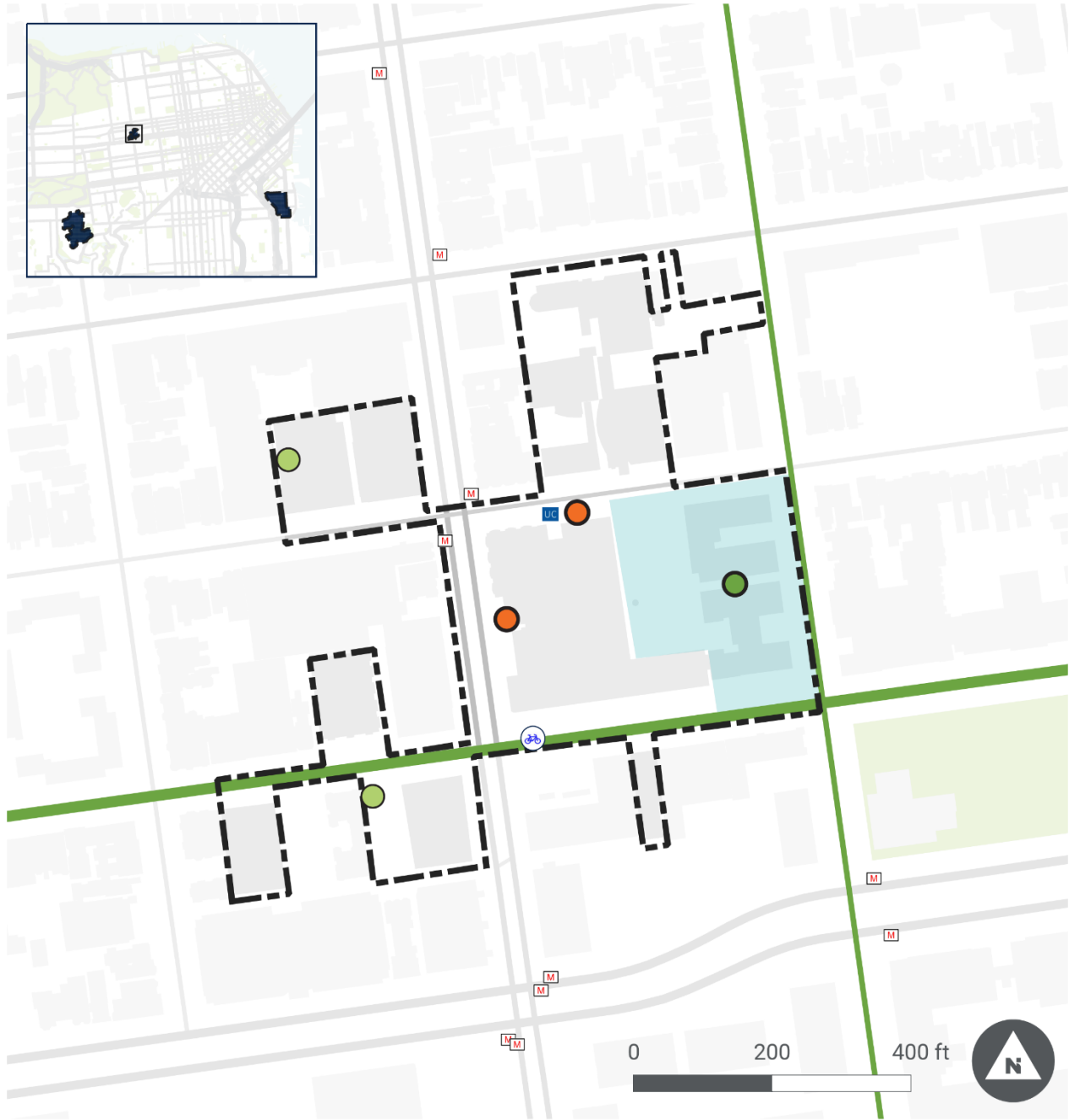
- Future Buildings
- Future Open Space

Proposed Network Concept

- Separated Bikeways
- Shared, Slow Spaces
- Pedestrian Priority Zones

Bike/Micromobility Parking

- Existing Active Commuter Hub
- Recommended Active Commuter Hub
- Existing Building Bike Room
- Recommended Building Bike Room
- Existing Mobility Node
- Recommended Mobility Node



Base Information

- Existing High-comfort Bikeway
- Mount Zion Campus Boundary

Future Development

- Future Buildings

Proposed Network Concept

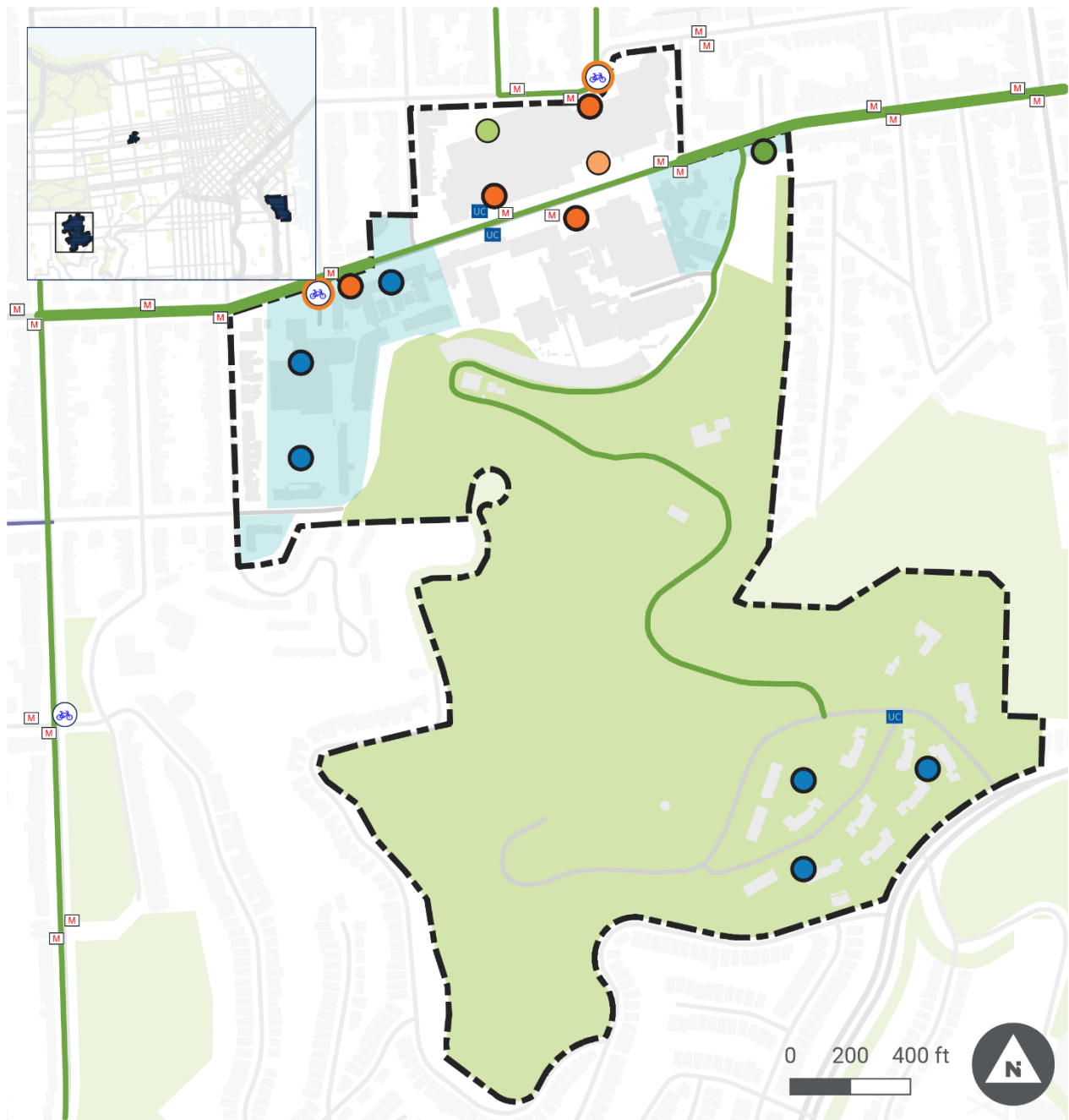
- Separated Bikeways
- Shared, Slow Spaces

Bikeshare



- Existing Station

Bike/Micromobility Parking

- Existing Active Commuter Hub
- Recommended Active Commuter Hub
- Recommended Mobility Node





Base Information

-  Existing High-comfort Bikeway
-  Parnassus Heights Campus Boundary

Future Development

-  Future Buildings

Proposed Network Concept

-  Separated Bikeways
-  Shared, Slow Spaces

Bikeshare

-  Recommended Station

Bike/Micromobility Parking

-  Existing Active Commuter Hub
-  Recommended Active Commuter Hub
-  Recommended Building Bike Room
-  Existing Mobility Node
-  Recommended Mobility Node

UCSF RACK STYLES, MATERIALS, AND INSTALLATION GUIDANCE

The effectiveness of bicycle/micromobility parking is influenced by numerous factors, including rack style, materiality, and installation.

UCSF STANDARD RACK STYLES

In general, it is important for bicycle/micromobility parking styles to meet the following four principles:

1. The style should be recognizable as bicycle/micromobility parking and intuitive to use correctly without instructions.
2. The style should accommodate a wide range of bikes and devices with different heights, lengths, widths, and weights.
3. The style should support a bike upright when locked and allow a user to lock the frame and at least one wheel with a U-lock.
4. The style should be designed and constructed with appropriate materials to prevent tampering and deterioration.

To ensure resources invested are functional, user-friendly, and durable, standard rack style types and material requirements have been developed for UCSF.

Space Efficiency	Rack Style	Parking Supply Per Rack	Bike/Micromobility Type Supported				
			Bike	Adaptive bike	Cargo bike	E-bike	Scooter
Lower	Inverted U/Hoop	2 spaces	yes	yes	yes	yes	yes
Higher	Vertical Rack	varies	yes	no	no	some	no
	Double Decker	varies	yes	yes	no	some	no

Each of the rack styles selected for UCSF have benefits and tradeoffs. In general, the lower capacity styles (inverted U/Hoop) meet all four of the principles identified above and will be effective for virtually all people who need to lock their bike or scooter. The higher-capacity rack styles (Vertical and Double Decker) do not accommodate all bike styles (including many cargo bikes and heavier bikes, like e-bikes), but provide space efficiencies. In recognition of these limitations, a minimum of 25% of all bike/micromobility parking provided within UCSF bicycle parking facilities must be ground-mounted (inverted U/Hoop).

MATERIAL SELECTION

Material recommendations for UCSF bicycle parking have been developed using industry best practices for durability, cost effectiveness, and longevity while considering UCSF campus needs and climate considerations. Taking into account these factors, galvanized carbon steel is recommended for all outdoor and/or large-scale

bicycle parking at UCSF because it is only marginally less durable than stainless steel but comes at a much lower cost. Stainless steel may also be explored for use for indoor bike rooms and other weather-protected facilities.

Durability	Rack Material	Relative Cost	Estimated Warranty from Manufacturers	Recommended for use at UCSF
 <p>Most Durable</p> <p>Least Durable</p>	<p>Stainless steel does not need a coating but may be machined for appearance. It has the most durability and resistance to cutting. However, it can be a target for theft because stainless steel has a higher material value. Aesthetic upkeep is also more difficult.</p>	\$\$\$\$\$	5 years	In weather protected locations only
	<p>Galvanized carbon steel is generally low-maintenance and touch ups are easy and blend seamlessly. It has a rough, “utilitarian” look.</p>	\$\$	5 years	Preferred material
	<p>Thermoplastic carbon steel is relatively durable but degrades over time with wear including scratches.</p>	\$\$\$	1 year	Not preferred
	<p>Powder coat (TGIC or similar) carbon steel requires ongoing maintenance and is not durable enough for weather exposure and large-scale parking hubs.</p>	\$\$	1 year	Not preferred

INSTALLATION GUIDANCE

RACK MOUNTING/INSTALLATION

Bicycle racks can be mounted to many surfaces, but hardscape surfaces are preferred and bolting to a concrete pad provides the easiest installation. Racks can be bolted to asphalt, pavers, and soft surfaces, though these surfaces are less ideal because of the flexibility in the material. Most on-street bike corrals use a series of racks connected by rails that are bolted to the asphalt to give the racks more points of contact and stability with the surface. Freestanding racks can also be installed on grass, dirt, and natural surfaces, but require concrete footing to be poured to anchor the rack. Fasteners include concrete spikes or tamper-resistant nuts on wedge anchors.

- Concrete spikes can be installed with a hammer and are tamper-resistant, however their removal can damage concrete.
- Concrete wedge anchors are not tamper-resistant, but allow for removal without damage. To augment security, concrete wedges should be used with security nuts.

RACK SPACING

The installation guidance provided is adapted from SFMTA’s recommendations. All diagrams are provided with credit to SFMTA. In addition to providing a safe and accessible layout, the rack spacing provided is also intended to ensure that every rack is able to be used to the full extent of its capacity. Racks that are installed with inadequate aisles and clearances may not be functional and may impede accessibility.

Horizontal Clearance Requirements

Racks placed parallel to a wall should be at least 3-feet from any vertical obstruction. When placed perpendicular to a wall, a rack should be a minimum of 2-feet away from any vertical obstruction and 4-feet from another rack.

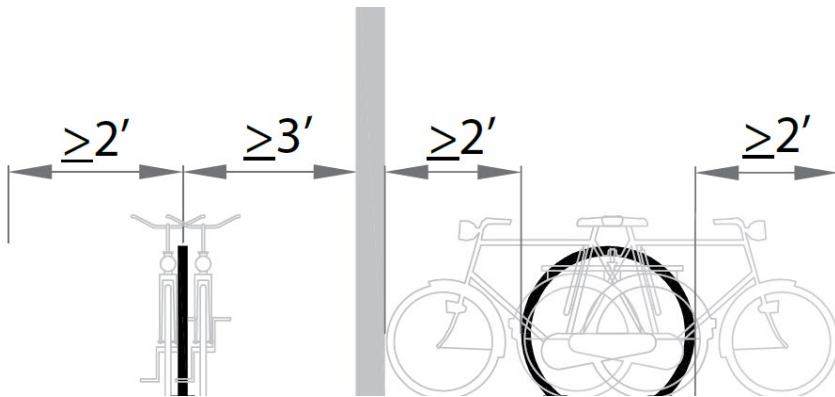


Figure 1: Horizontal Clearance Requirements for Racks Installed Parallel and Perpendicular to Fixed Objects (credit: SFMTA)

Vertical Clearance Requirements

Racks should have at least 7-foot clearance from the ground to the ceiling or other vertical obstruction. SFMTA also notes that racks should be installed on surfaces with minimal slopes (as close to 0% grade as possible).

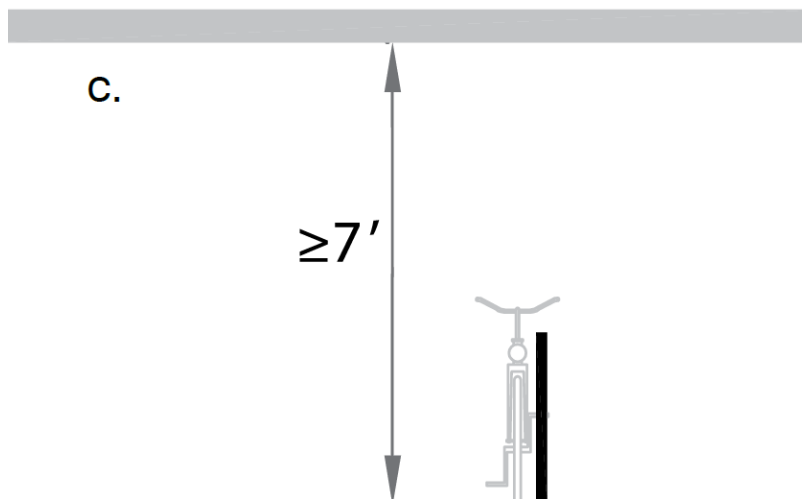


Figure 2: Vertical Clearance Requirements (credit: SFMTA)

Rack Spacing and Aisles Clearances

High-capacity bicycle and micromobility parking may be provided in a range of aisle configurations. Depending on the configuration, different spacing requirements should be applied. In all cases, a minimum clear space of 4-feet must be provided to allow for maneuvering and safe access/egress. Aisle spacing must consider not just rack placement, but the typical length/width of bikes that will be locked to the rack. In general, standard bike dimensions are roughly:

Standard and Extra-wide Bikes

Standard bikes are generally 6-feet long or shorter and 2-feet wide. While the dimensions of cargo bikes and other oversized bikes can vary in dimensions, most cargo bikes are 8.5-feet long or shorter and 2-feet wide. Extra-wide spaces at UCSF should be installed to accommodate bikes up to 8.5-feet in length.

Spacing for Inverted U/Hoop Racks Installed Perpendicular to Aisles

When installing racks perpendicular to aisles, standard bicycles should be expected to extend 3-feet from the center of an inverted U or Hoop rack while cargo bikes should be expected to extend 5-feet from the center of the rack.

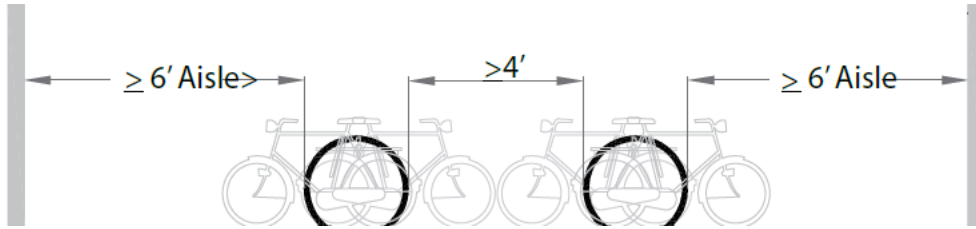


Figure 3: Spacing Requirements for Racks Installed Perpendicular to Aisles on Both Sides (credit: SFMTA)



Figure 4: Spacing Requirements for Racks Installed Perpendicular to an Aisle in the Middle (credit: SFMTA)

Spacing for Inverted U/Hoop Racks Installed Parallel to Aisles

When installing racks parallel to aisles, both standard and cargo bicycles should be expected to extend 1-foot from the center of an inverted U or Hoop rack.

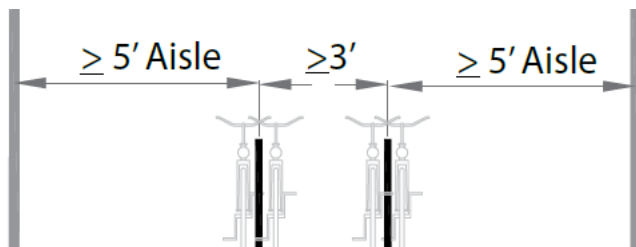


Figure 5: Spacing Requirements for Racks Installed Parallel to Aisles on Both Sides (credit: SFMTA)

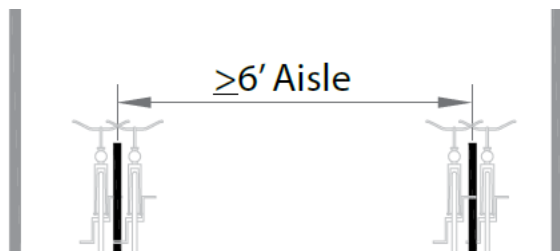


Figure 6: Spacing Requirements for Racks Installed Parallel to an Aisle in the Middle (credit: SFMTA)

Spacing for Vertical and Double Decker Racks

Vertical Racks should be spaced a minimum of 16 inches between mid-points of one rack to another. In addition, aisle space from the nearest edge of bicycles and racks should be at least 5-feet (60 inches).

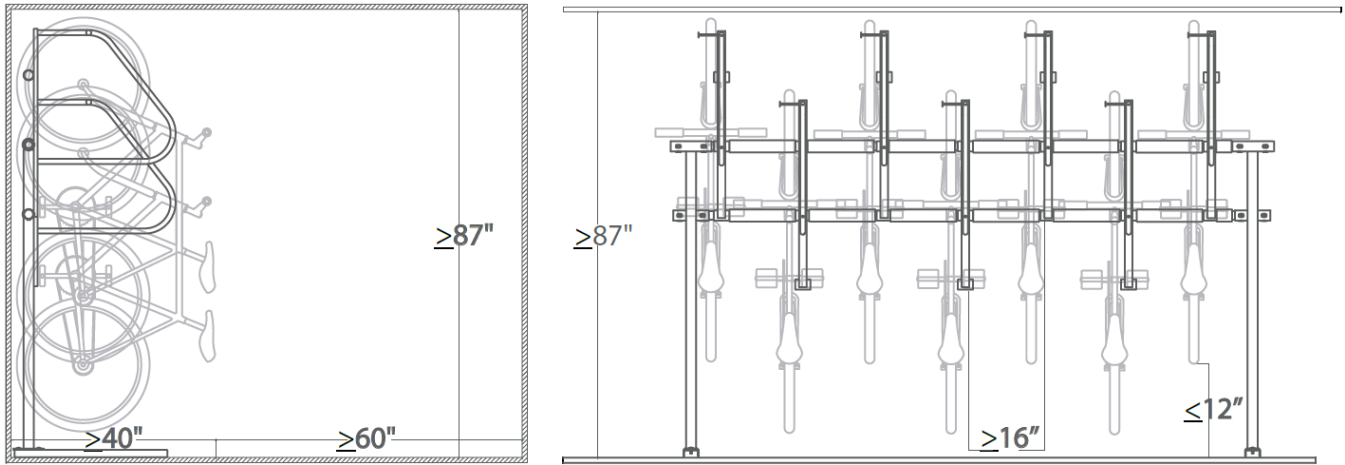


Figure 7: Spacing Requirements for Vertical Racks (credit: SFMTA)

Double Decker Racks should have a clearance of 17 inches between bicycles, from mid-point of one rack to another. Aisle space from the nearest edge of bicycles and racks should be at least 5-feet (60 inches). All Double Decker racks used at UCSF must be equipped with a lift assist for the top rack.

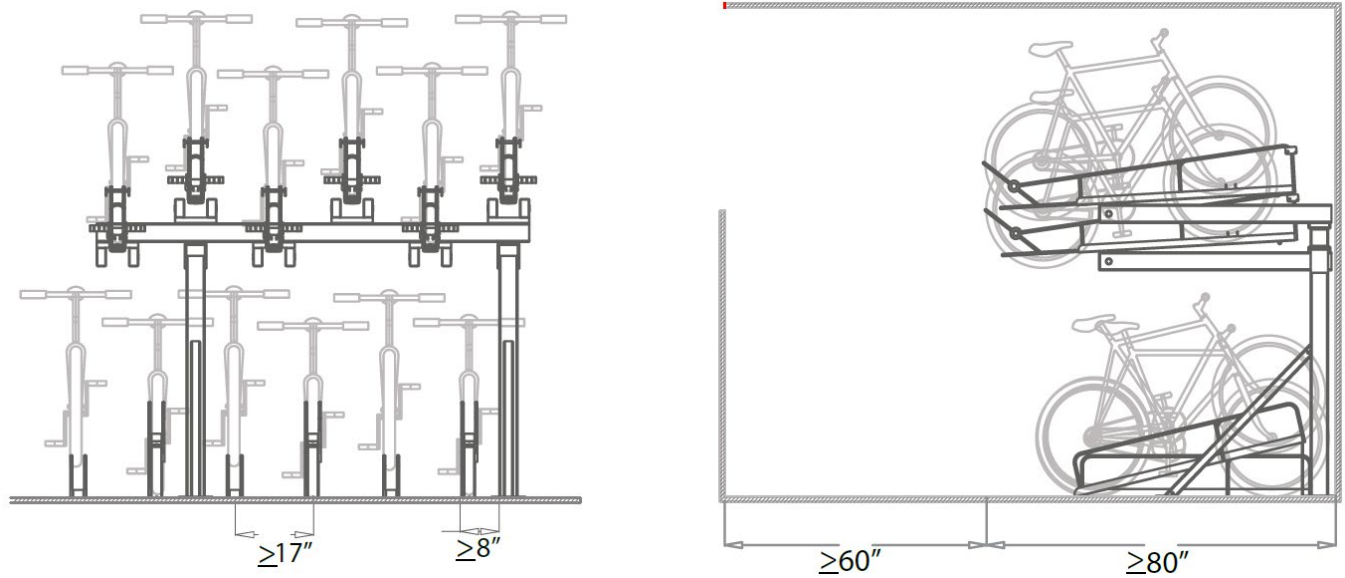


Figure 8: Spacing Requirements for Double Decker Racks (credit: SFMTA)