Fall 2014

Texas A&M University Bicycle Racks

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Objective:

Identify the bike rack design on Texas A&M University's main campus that is most correlated with minimum contact between bikes. In addition, show areas that lack bike rack availability.

Gathering Data:

A bicycle map was provided by Douglas Wunneburger. The files include Texas A&M's Campus Map with locations and different types of bicycle racks.

To further our research, characteristics of each bike rack were recorded. The data collected includes:

- Type of bicycle rack
- Number of bicycle racks at each location
- Number of bicycles at each location
- The level of contact of the bike rack

The level of contact of each bike rack was classified as minimal, moderate, or high. Examples of these recordings are shown below in Figure 1. Minimal contact describes a relationship among bicycles where each bike has limited physical contact with other bikes. Moderate contact consists of bikes being considerably close to one another, causing one to put more effort into removing or locking their bike in addition to an increased likelihood of bicycle damage. High contact bicycle racks support a significant level of traffic among parked bicycles.

Figure 1: From left, minimal, moderate, and high levels of contact.

Data Analysis:

GIS was used to display spatial correlations from the data. There are several maps displaying different types of data. These maps show:

- Design of bicycle rack and their location
- Number of bicycle racks at each location
- Number of locations with minimal contact of the bikes

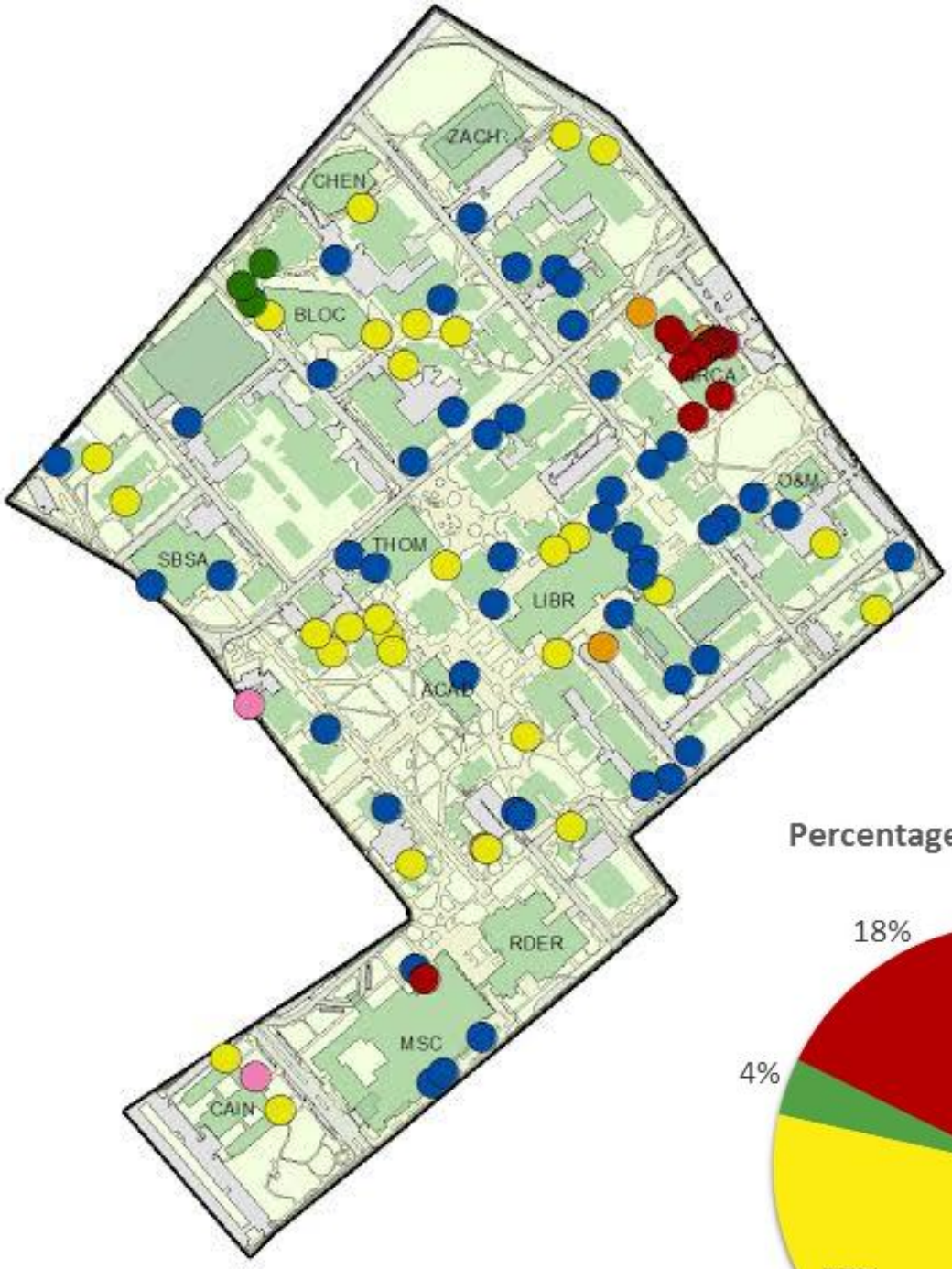
- Number of locations with moderate contact of the bikes
- Number of locations with high contact of the bikes
- 50 and 100 foot buffer surrounding each bike rack location
    - The City of New Orleans recommends bike racks be located within 50 feet of main entrances. For the purpose of mapping the data, 100 foot buffers were used to better reveal areas without bike racks.

Conclusion:

The “Diagonal” and “Ring” design bike racks were represented the most on the minimal contact map. The “Diagonal” designed bike racks had a 100% minimal contact rate, with “Ring” design having a 95% minimal contact rate. The “Potato masher” also had a 100% minimal contact rate, however, only two of these types of racks were found on campus making the percentage less significant.

The most obvious areas lacking bike racks are those around the Zachry building, the Memorial Student Center, and especially Rudder Tower.

Texas A&M University Bike Rack Types



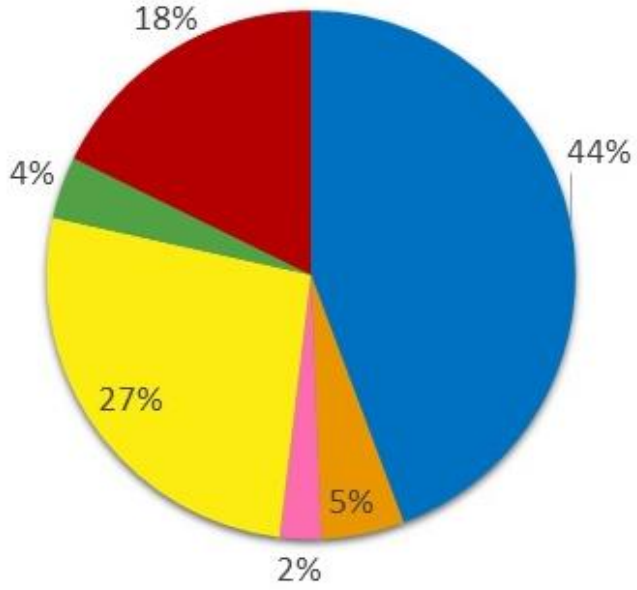
Legend

Type

- Coat Hanger
- Ring
- Diagonal
- Potato masher
- Circle
- U

0 205 410 820 1,230 1,640 Feet

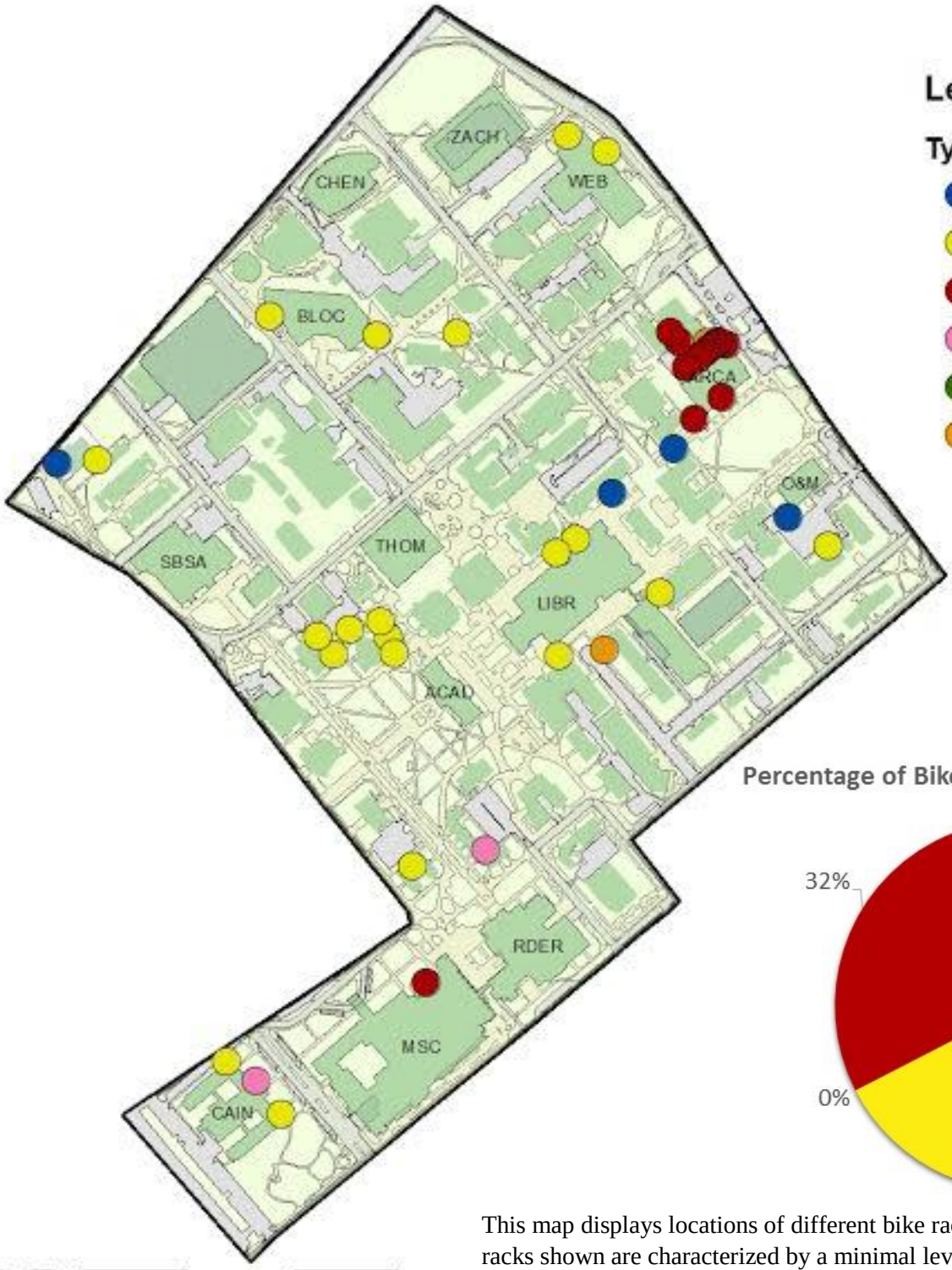
Percentage of Bike Rack Type



Projected Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203
Projection: Lambert Conformal Conic
Geographic Coordinate System: GCS North American 1983

N

Minimal Contact Bike Racks

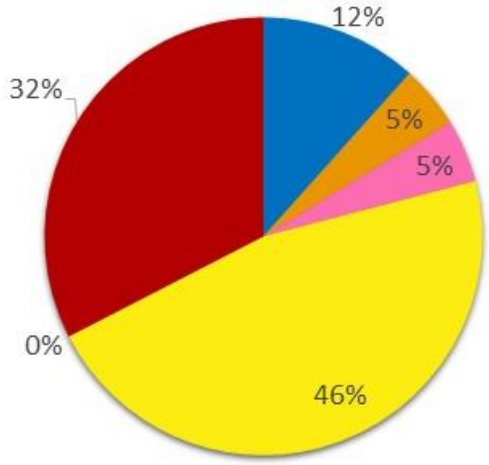


Legend

Type

- Coat Hanger
- Ring
- Diagonal
- Potato masher
- Circle
- U

Percentage of Bike Racks with Minimal Contact



0 190 380 760 1,140 1,520 Feet

This map displays locations of different bike rack designs on campus. The racks shown are characterized by a minimal level of contact in relation to other bikes on the same rack. This low level of contact may be due to various reasons such as, having a designated spot to place each bike, a low amount of bikes in the bike rack, or an inconvenient location of the rack. The pie chart shows the percentages of the types of bike racks out of all the ones recorded with minimal contact. The "Ring" type was recorded having the most at 46% while the "Diagonal" type followed with 32% and the lowest being the "Circle" type with 0%.

Projected Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203
Projection: Lambert Conformal Conic
Geographic Coordinate System: GCS North American 1983

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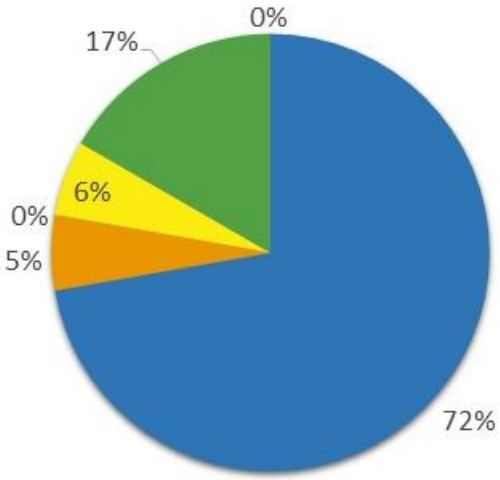
Moderate Contact Bike Racks

Legend

Type

- Coat Hanger
- Ring
- Diagonal
- Potato masher
- Circle
- U

Percentage of Bike Racks with Moderate Contact



0 190 380 760 1,140 1,520 Feet

This map displays locations of different bike rack designs on campus consistent with a moderate level of contact. The pie chart shows the percentages of the types of bike racks out of all bikes recorded with moderate contact. The “Coat Hanger” rack has the most recorded making up 72%, with the “Circle” type following with 17%, and both the “Diagonal” and “Potato Masher” types had no racks with moderate contact.

Projected Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203
Projection: Lambert Conformal Conic
Geographic Coordinate System: GCS North American 1983

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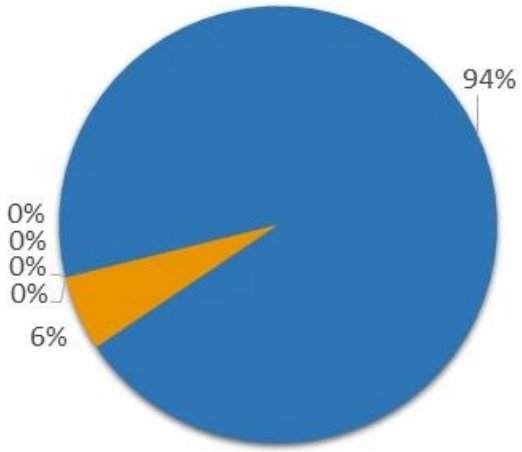
High Contact Bike Racks

Legend

Type

- Coat Hanger
- Ring
- Diagonal
- Potato masher
- Circle
- U

Percentage of Bike Racks with High Contact



0 190 380 760 1,140 1,520 Feet

This map displays locations of different bike racks on campus with a high level of contact. Moving one bike requires movement and manipulation of surrounding bikes increasing inconvenience and the risk of damage. High contact had the least amount recorded among these levels of contact. The pie chart shows the percentages of the types of bike racks out of all recorded with high contact. The “Coat Hanger” rack made up the most of the bike racks with high contact with 94%. However, this type is also the most popular bike rack across campus. The “U-Shaped” rack contributed the other 6%, while the other bike racks had no high level recordings.

Projected Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203
Projection: Lambert Conformal Conic
Geographic Coordinate System: GCS North American 1983

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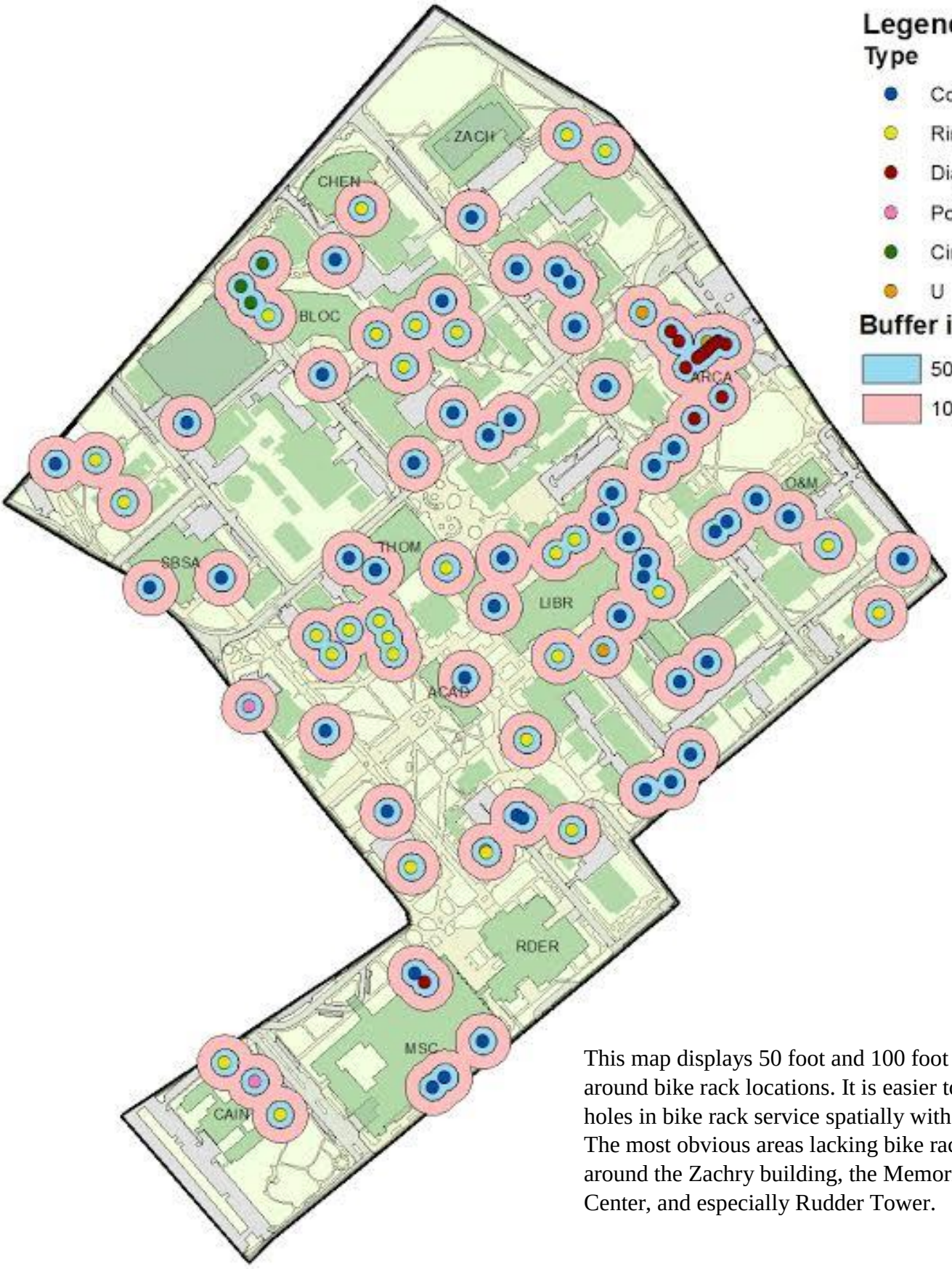
Bike Rack Buffer



Legend

Type

- Coat Hanger
- Ring
- Diagonal
- Potato masher
- Circle
- U

Buffer in Feet

- 50
- 100

This map displays 50 foot and 100 foot buffer around bike rack locations. It is easier to identify holes in bike rack service spatially with this tool. The most obvious areas lacking bike racks are those around the Zachry building, the Memorial Student Center, and especially Rudder Tower.

0 162.5 325 650 975 1,300 Feet

Projected Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203
Projection: Lambert Conformal Conic
Geographic Coordinate System: GCS North American 1983

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