# OSU Bicycle Parking Utilization Study 2015

Capital Planning and Development

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## Executive Summary

- In 2015, the campus wide bike parking capacity was 8,855 spaces; this was an increase of 674 spaces over the 2014 capacity count.
- Between the hours of 10 am and 12 pm, campus wide bicycle parking utilization was 55 percent.
- There was no change in campus wide bicycle parking utilization between 2014 and 2015.
- Higher utilization rates were observed at the residence halls and in the northeast area of campus (Attachment A). This pattern is consistent with previous survey years.
- 108 locations had utilization rates of 75 percent or greater.
- Bike Survey Section 4 had the highest overall utilization rate of 74 percent, while Section 5 had the lowest utilization (42 percent).
- Twenty-three (23) locations had abandoned bicycles.
- Six (6) locations had installation problems affecting capacity.
- Thirty-three (33) locations had some degree of damage.

# OSU Bicycle Parking Utilization Study

## Overview

In the fall of 2015, Oregon State University (OSU) conducted a comprehensive bicycle parking survey. The survey recorded bicycle rack utilization and condition. The survey was conducted on Tuesday and Wednesday, October 20th and 21st. The weather conditions on the days of the survey were fair for biking. Both days were approximately 51 degrees, with a few showers.

Total capacity for on-campus bike parking was inventoried at 8,855 bike parking spaces. Of these spaces, 3,222 (36.4 %) are covered and 5,633 (63.6 %) spaces are uncovered. These values reflect an increase in overall capacity and the provision of more covered spaces over the 2014 survey. The 2015 survey measured an average campus bicycle parking utilization rate of 55 percent. This utilization rate is identical to the utilization rate recorded in the fall 2014 survey. Areas with utilization exceeding capacity generally included the residence halls and the relatively more densely developed northeast area of campus. This is consistent with the utilization patterns observed in surveys conducted in previous years.

## Methodology

The methodology of the 2015 Bicycle Utilization Survey differed from the methodology utilized in previous years in several ways. Prior to 2015, the capacity and utilization counts were conducted on the same days. In 2015, bike parking capacity was evaluated in the weeks before the utilization survey. This change was made to simplify the task of data collection during the utilization survey in order to eliminate errors and confusion resulting from the simultaneous collection of capacity and utilization. Also, in previous years the survey was timed to occur in the third week of October to capture good cycling weather as well as high student enrollment. In 2015, the timing of the bike parking survey was altered to coincide with the vehicle parking survey. Bicycle parking and vehicle parking counts were conducted on the same days to allow OSU to capture a snapshot of overall multimodal parking patterns on campus. The final changes to the 2015 methodology were the storage of the bike rack data as feature attributes within ArcGIS, and the analysis of the utilization data in MS Excel spreadsheets. Prior to 2015, the capacity and utilization data were both stored in an MS Access database, and the GIS bike rack features did not contain rack attribute data, such as capacity, hoop style, or covered/uncovered status. This created some challenges with mapping and redundancies in the annual data update process. Storing bike parking capacities and rack feature attributes in ArcGIS rather than MS Access facilitates a simplified data update, analysis, and mapping process. Staff believes the analysis of the bicycle parking data does not require the use of database software separate from ArcGIS and can be conducted within a simpler spreadsheet format while using the data attribute recording capacities of ArcGIS. The resulting data can then be more easily mapped using ArcGIS software.

The bicycle parking capacity inventory measures the number of functional bike parking spaces on campus, the type of rack (e.g., hoop or non-hoop), as well as if bike parking is covered or uncovered. Capacity counts were conducted by a Planning Assistant in September 2015, the month before the Utilization counts. The Planning Assistant walked through campus locating and recording in GIS the existing, new, and removed bike racks. Maps from a 2014 bike parking GIS project were used for reference in the field, as well as a comparison for the newly collected data. During the capacity inventory, the Planning Assistant counted the functional bike parking spaces in each rack, the type of rack and its status as covered or uncovered, and also documented severely damaged racks.

Utilization is measured by counting the number of bicycles in or adjacent to racks. In order to measure utilization, campus is divided into six (6) sections **(Attachment A: Survey Section Maps).** The bike

parking sections differ from the Campus Master Plan (CMP) sectors, providing a finer grained analysis of bike parking in the central core of campus. Faculty and staff volunteers walked through campus counting bicycles parked within or immediately adjacent to bike racks. Bikes locked to trees, railings and otherwise out of but near racks were counted and documented within the survey. Abandoned bikes and damaged racks were also noted. Surveyors collected data by hand on paper forms, using maps and tables generated from the capacity inventory.

The survey was conducted between 10 a.m. and 12 p.m. on Tuesday and Wednesday, October 20th and 21st. Two mid-week days were chosen to produce an average utilization figure for all bike parking locations based on data collected on both a lecture and a lab day. The number of students on campus differs on lab and lecture days, and similarly, lab and lecture building use differs between days. For this reason, it is necessary to survey on both days to determine the average utilization.

Analysis was conducted using MS Excel and ArcGIS. Using Excel tables, the survey data was used to evaluate the changes in capacity and utilization over previous years as well as the current trend of utilization and capacity across campus. Where relevant, results were mapped using ArcGIS. Using ArcGIS it is possible to see the locations on campus that have damaged racks, rack installation problems, and abandoned bicycles. ArcGIS also makes it possible to see which areas have the highest capacity and utilization (reflected as a percentage of capacity).

## Capacity Inventory

Bike parking capacity is the number of functional bike parking spaces available on campus. Hoop racks provide two (2) spaces per hoop when installed correctly. Incorrect installation, abandoned bikes, and damage to racks may reduce capacity. The capacity inventory indicates the number of bicycle parking spaces that are present within correctly installed and undamaged racks. Racks with damage and installation problems are recorded during the capacity inventory, while racks with abandoned bicycles are recorded within the utilization survey. The 2015 survey found twenty-three (23) locations with abandoned bicycles, (six (6) locations with installation problems affecting capacity and thirty-three (33) locations with some degree of damage (**Attachment B**). Locations with abandoned bikes, installation problems affecting capacity, and damage are mapped in **Attachment C**.

The first year of the bike parking survey (2008) there were 6,145 bike parking spaces on campus. OSU has increased bike parking every year since the survey began, installing more than 300 new bike racks every year or 600 bike parking spaces. As of 2015, there were 8,855 bike parking spaces available on campus (Table 1), which was an increase of 674 new bike parking spaces over the previous year. Since 2008, OSU has also increased the percentage of bike parking capacity that is composed of standard hoops and increased the provision of covered bike parking (Table 2 and Table 3 respectively).

***Table 1: OSU Bike Parking Capacity 2008-2015***

| Survey Year | *Campus Wide Capacity* |
|---|---|
| 2008 | 6,145 |
| 2010 | 6,842 |
| 2012 | 7,491 |
| 2014 | 8,181 |
| 2015 | 8,855 |

***Table 2: OSU Standard Hoop Spaces 2008-2015***

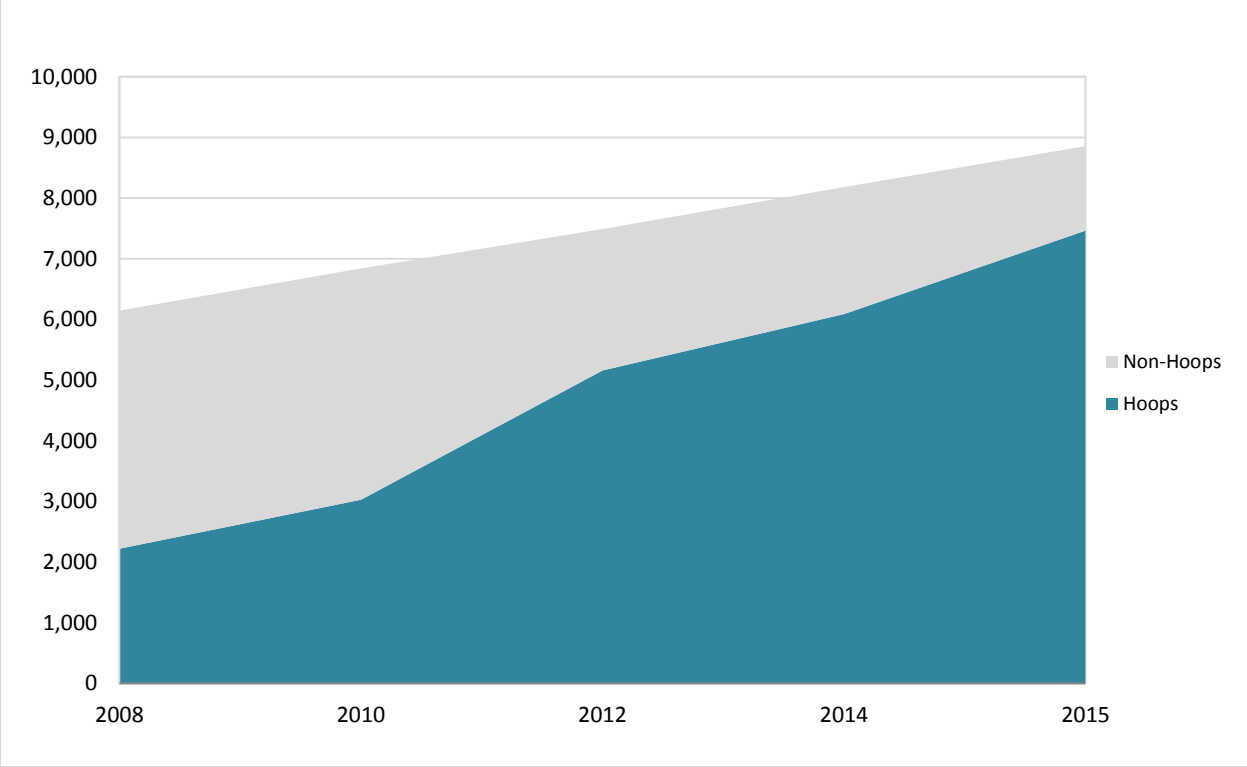
| Survey Year | *Hoop Spaces* | *Non-Hoop Spaces* | *Total Capacity* | *Hoop Capacity* |
|---|---|---|---|---|
| 2008 | 2,219 | 3,926 | 6,145 | 36% |
| 2010 | 3,026 | 3,816 | 6,842 | 44% |
| 2012 | 5,156 | 2,335 | 7,491 | 69% |
| 2014 | 6,084 | 2,097 | 8,181 | 74% |
| 2015 | 7,462 | 1,393 | 8,855 | 84% |

***Table 3: Covered Bike Parking Spaces 2008-2015***

| Survey Year | *Covered Spaces* | *Uncovered Spaces* | *Total Capacity* | *Covered Capacity* |
|---|---|---|---|---|
| 2008 | 1,759 | 4,386 | 6,145 | 29% |
| 2010 | 2,108 | 4,734 | 6,842 | 31% |
| 2012 | 2,326 | 5,165 | 7,491 | 31% |
| 2014 | 2,755 | 5,426 | 8,181 | 34% |
| 2015 | 3,222 | 5,633 | 8,855 | 36% |

The 2015 capacity survey found that of the 8,885 OSU bike parking spaces on campus 7,462 spaces, or 84 percent are provided by OSU standard hoops (**Table 2**). The remaining 1,393 are racks of other varieties. OSU installs standard hoops with all new construction projects, and typically replaces non-hoop racks with hoops when a change would not interfere with pedestrian access. In 2008, OSU had only 2,219 hoop spaces available on campus. Between 2014 and 2015, OSU installed 1,378 hoop-spaces (689 individual hoops) **(Table 2)**. Some of these were installed with new development, while others replaced non-hoop racks in existing parking locations throughout campus. **Figure 1** illustrates the increase in the ratio of hoop spaces to non-hoop bike parking spaces between 2008 and 2015.

***Figure 1: Hoop and Non-Hoop Bike Parking Capacity Change Over Time***

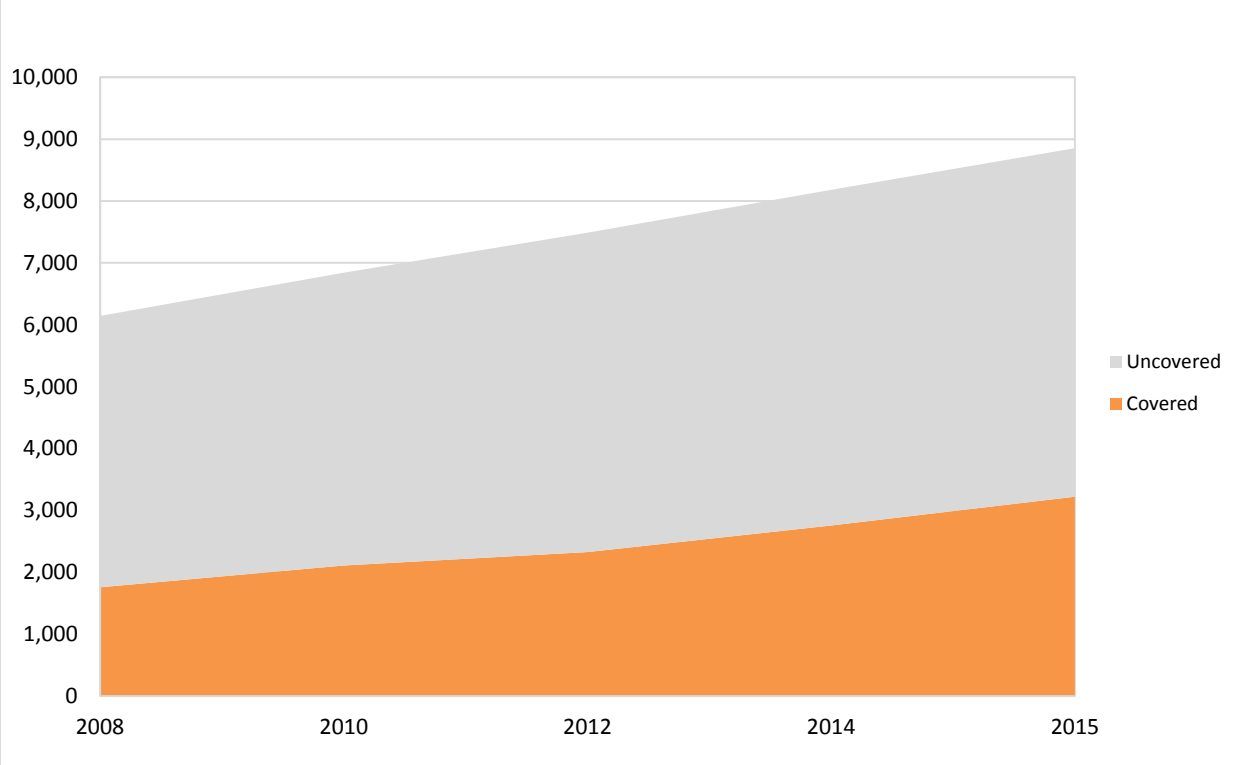



Covered bike parking is parking which is underneath a bike shelter, within an enclosed area such as a porch, or substantially protected by building eves. The 2015 bike parking capacity inventory found that there were 3,222 covered bike parking spaces on the OSU campus at the time of the survey (36 percent covered) (**Table 3**). The remaining 5,633 spaces were uncovered. With new development, OSU must provide 50 percent of required new bike parking as covered (LDC Section 3.36.60.13.c). In 2008, only 29

percent of bike parking capacity was covered **(Table 3)**. In 2015, OSU installed several covered bike shelters with new development, including those at the Learning Innovation Center and Student Experience Center. Between 2008 and 2015, OSU increased the percentage of covered bike parking spaces by 7 percent of total capacity (**Figure 2**).

Numerous factors affect the provision of covered bicycle parking. Covered bicycle parking is significantly costlier than uncovered parking. Covered bicycle parking costs approximately $2,300 per space. Uncovered parking costs approximately $100 per space. Additionally, siting covered bicycle parking is more challenging than uncovered hoop racks due to the size of the structures; this is especially true in the built-out, historic portions of campus, given the need to balance function, aesthetics, mode-prioritization, and safety. The City of Corvallis's regulations on development within the OSU National Historic District applies to the installation of new covered bike racks, which are subject to review and approval by the City of Corvallis Historic Resource Commission. Despite these complications, there has been a 44 percent increase in both covered and uncovered bicycle parking between 2008 and 2015.

***Figure 2: Covered and Uncovered Bike Parking Capacity Change Over Time***




Currently, the majority of bike parking is located predominantly in the northeast portion of campus, with large capacity racks located near residence halls and within the campus core **(Attachment D)**. Complete details on campus wide capacity, capacity per section and capacity per rack are found within **Attachment E. Figure 3** provides a summary of bike parking capacity campus wide, while **Figure 4** illustrates capacity by type, per section. **Attachment F** provides a map of rack style by location.

***Figure 3: 2015 Bike Parking Type - Capacity Campus Wide***

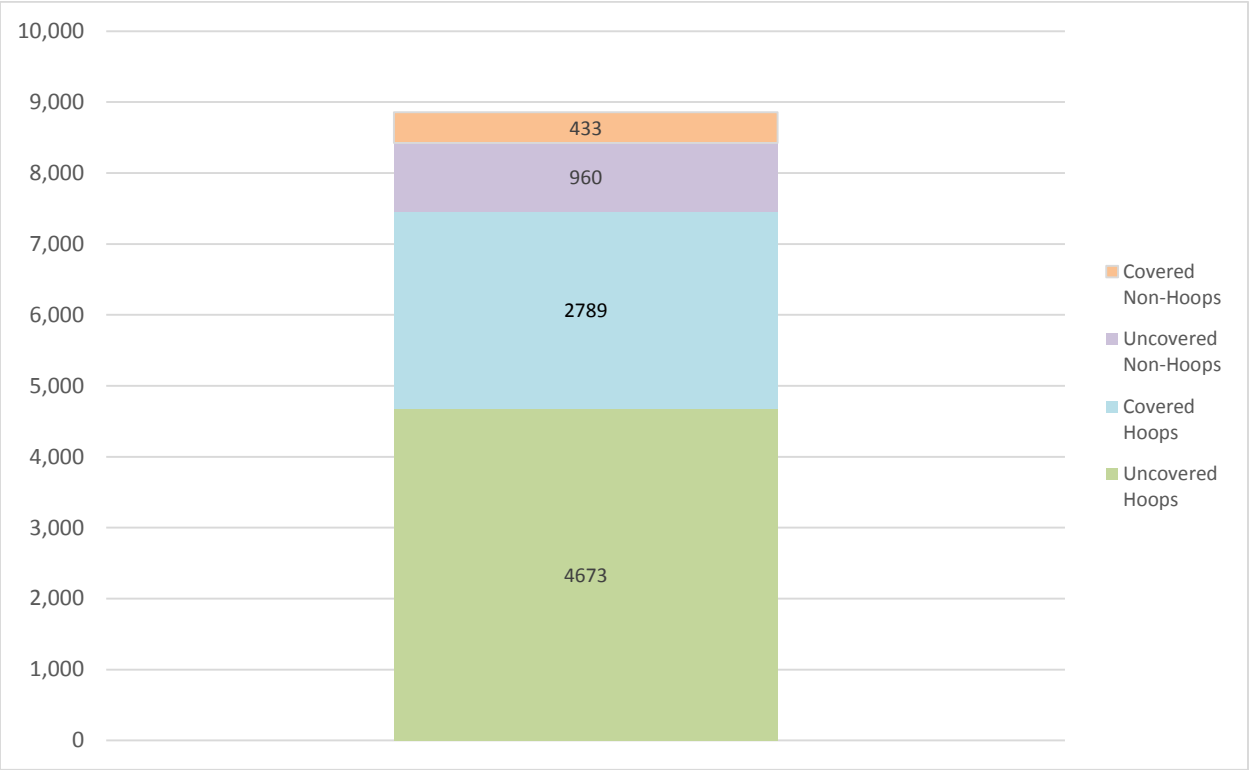
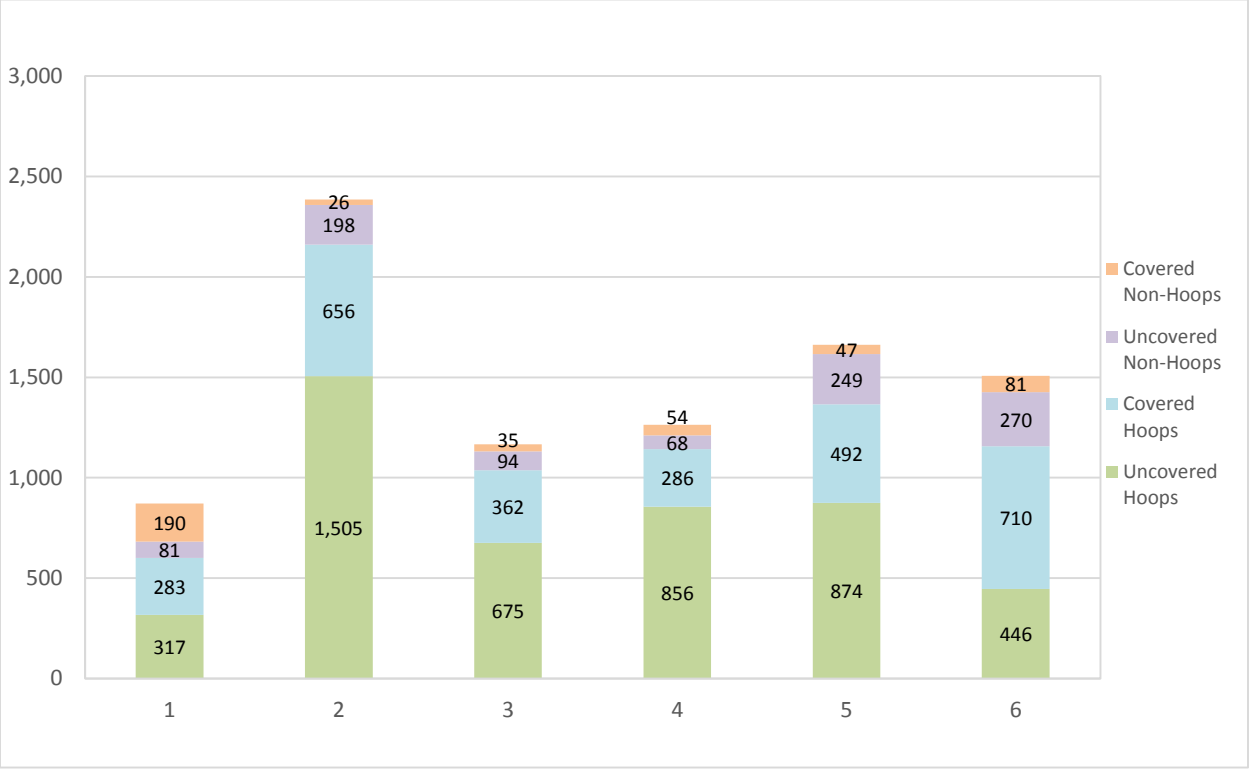



***Figure 4: 2015 Bike Parking Type - Capacity by Section***



## Utilization Survey

The survey was conducted between 10 a.m. and 12 p.m. on Tuesday and Wednesday, October 20th and 21st. The weather conditions on the days of the survey were fair for biking. It was approximately 51 degrees and mostly clear, with some slight showers. The 2015 utilization survey found the average campus wide utilization was 55 percent (**Attachment E**). This utilization rate is the same as that which was observed in 2014. However, numerous locations were observed to have utilization rates in excess of 100 percent. One hundred eight (108) locations had utilization rates of 75 percent or higher **(Attachment G).** Like previous years, those locations were concentrated around residence halls and in the northeast portion of campus (**Attachment H**). The utilization rates indicate a user preference for hoop racks and covered racks. The highest utilization rates, campus wide, are observed with covered hoop and covered non-hoops racks (57 percent), followed by uncovered hoops (56 percent), and finally uncovered non-hoops have the lowest utilization (37 percent) **(Figure 5).** This pattern is generally consistent across sections, with some exceptions (**Figure 6**). In survey Section 2, uncovered non-hoop racks had a utilization rate of 78 percent. Complete details on campus wide utilization, utilization per section and utilization per rack are found within **Attachment G.**

***Figure 5: 2015 Bike Parking Type – Utilization Campus Wide***

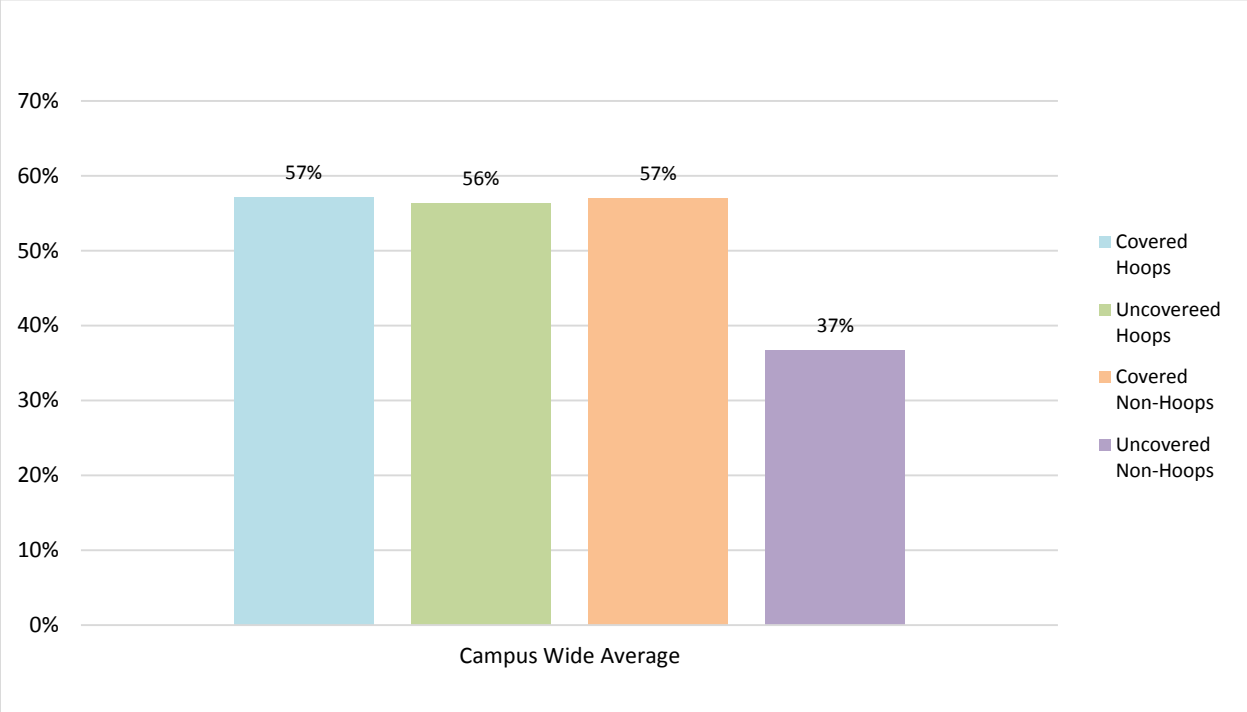
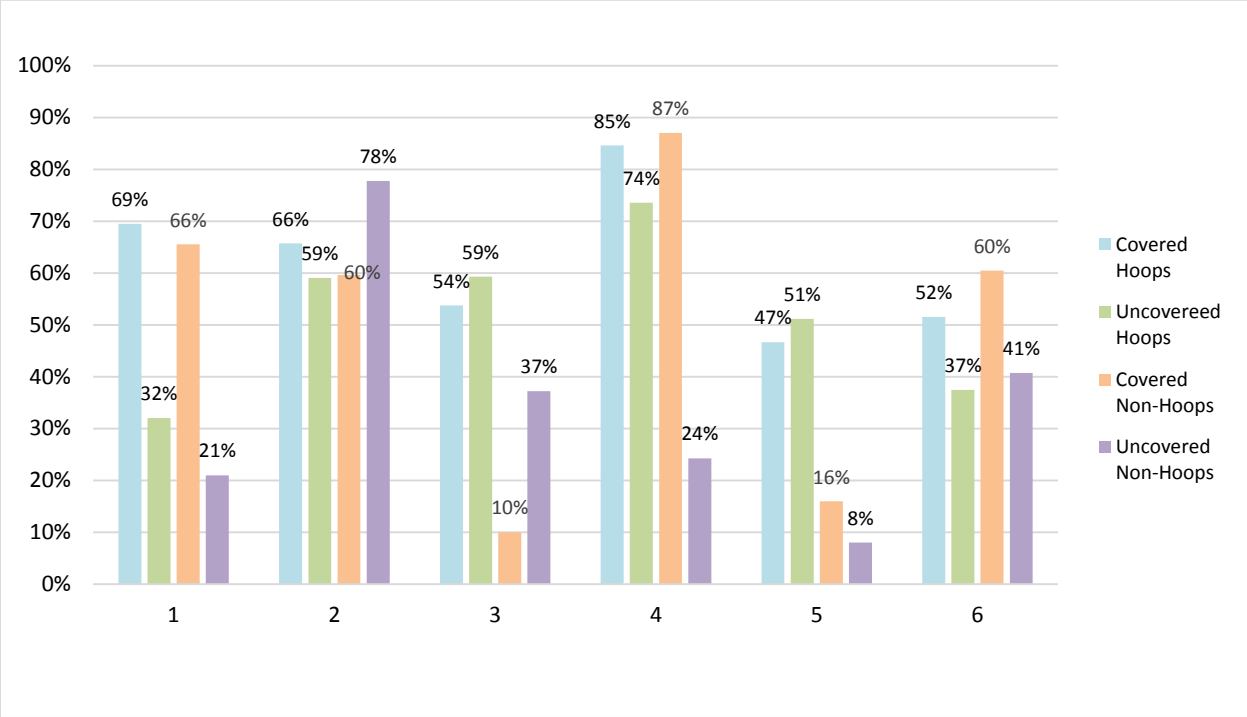


***Figure 6: 2015 Bike Parking Type - Utilization by Section***

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# Appendices

A- Bicycle Survey Sections

B- Condition Report

C- Condition Map

D- Bike Rack Capacity Map

E- Survey Detail Report

F- Rack Type

G- Sites with Utilization in excess of 75%

H- Utilization by Location