

Annual Bike Parking Census University of Colorado at Boulder Campus

Spring 2009 Plan

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Background

The CU-Boulder bike parking census has been completed twice since the fall of 2007, and is planned for annual reiteration. To improve this study, a spring census is being conducted in April, and semiannual censuses will be completed as resources are available. Data from the census is used to serve a variety of purposes for the campus, summarized below and explained in detail later in the plan.

First, the data is compared to past census results to determine changes and show trends in bicycles parked on campus, bicycle parking supply on campus, proportions of registered bicycles and proportions of bicycles parking in racks. These trends provide some insight as to behavioral changes of the campus population.

Second, the data is incorporated in the evaluation of existing bicycle parking facilities across the campus. Specifically, utilization rates for existing parking and occurrence of bicycles not parked at racks ("errata") combine to show the performance efficiency of the bicycle parking supply—a campus with sufficient rack supply but prevalent "errata" demonstrates an inefficient infrastructure.

Finally, the data will be used to develop an infrastructure code that can be incorporated into the ongoing capital development of the campus. There are similar such codes for vehicular parking, ADA access and other categories of capital construction. Some relevant codes have been included with the popular US Green Building Council's "LEED" certification, but such codes are not required within the campus standards.

Methodology

The census counts bicycles parked in racks and elsewhere across the University of Colorado at Boulder. This includes the Main Campus, East Campus, Research Park and Williams Village campuses. It does not include the CINC center, or South Campus. Bicycles are distinguished between registered, unregistered, registered–abandoned and unregistered–abandoned. Registered bicycles are identified by a small serialized, vandal-proof sticker often located on the seat tube, and are blue, red, or silver, and say "University of Colorado Boulder". Bicycles are considered abandoned when they meet a combination of the following criteria, or are exaggerated in one criteria, or have been previously identified for impound:

1. rusted chain
2. flat or empty tire (often with dirt buildup)
3. missing major parts (wheel, handlebar, pedals, chain)
4. organic growth (vines/grass)
5. "extreme" damage (severely bent rim or frame)

Bicycles parked at rack sites are counted respective to each rack type at the site. That is, a given site may have both CORA- and Wave-type racks, and the counts for that site are broken out such that we know how many bicycles are parked at the CORA racks separate from those which are parked at the WAVE racks.

"Errata" bicycles are identified as not parked in a rack and are often locked to hand rails, sign-posts, trees, benches, etc. or may not be locked at all. Contiguous errata bicycles will be marked as one site; separate sites are identified when they are separated by one bike length or more. For reference and audit purposes, staff will photograph all errata sites identified.

Census staff meet prior for introduction and training. During census execution, staff walk the entire campus, broken out into zones, one staff per zone. Zones are designed to take approximately one hour to count, and are delimited using sidewalks or roads to prevent ambiguous or duplicate counts. Housing area zones will be recounted after-hours to gather over-night information.

Timeline

Staff will conduct the spring census during the week of April 20. This week is sufficiently after spring break and hopefully during a period of warm weather so that the majority of the cycling population have once again taken up this activity. Based on the 2006 BVES Transportation Survey, the majority of the campus population arrives prior to 11:00 am and begins to leave after 2:00 pm. Census staff will conduct midday counts between 11:00 am and 1:00 pm. After-hours counts at residence halls and Family Housing will take place after dark when it is believed the majority of residences will have returned their bikes to area racks. According to the NOAA ESRL sunset calculator, the sun sets during the week of April 20 starting at 7:45 pm. Counts will be conducted Monday through Friday for increased data analysis capabilities.

Data input will be completed the week following the study, and subsequent research & analysis will be completed in phases. Initial results will be provided to the bicycle parking project team. Trend data will be reported on by July 1, 2009. Further research and analysis will continue on an ongoing basis, with the next iteration of the census to be conducted during the fall of 2009.

Cost

Professional staff work with student bicycle program staff to complete the census. For the professional staff, their time is a component of their overall work projects. Each student staff will work 5 hours per day, with a weekly total of 75 hours. Staff will tentatively be paid \$10/hour for a total cost for the census of \$750. Minimal printing costs associated with generating count sheets and zone maps will apply. We will draw on personal cameras to eliminate any

equipment costs. Students from the Geography department may participate in the spring census as part of a class project, thereby eliminating the need to hire student staff.

Data, Research & Analysis

This census model is scalable—early censuses were conducted with only a one-day scope. This census uses a one-week scope, and as resources are available, this study will have improved accuracy and reliability with increased study days.

Trends

Data gathered during this spring census will be compared to that from past censuses. Among relevant trends are:

1. Change in overall number of bicycles on campus.
2. Change in the ratio of registered bicycles to unregistered.
3. Change in overall numbers of abandoned bicycles.
4. Change in the ratio of errata bicycles to those parked in racks.
5. Change in the utilization rates of bicycle racks (both in absolute inter-annual change, and in spatial shift across campus).

The spring census will include five distinct sets of counts (a set containing day-time and after-hour counts), one per day. Peak counts and average counts will be used and reported in the trends.

Bicycle Parking System Evaluation

At its most basic level, the census will provide the utilization rates for existing bicycle parking supply. The census will also update the complete bicycle parking inventory. In evaluating bicycle parking utilization, peak counts will be used, selecting the highest count per set, per day. Bicycle parking evaluation uses peak counts in order to evaluate the maximum potential effectiveness of bicycle parking—the moment a bicycle rack fills, bicycles are rejected and may begin to lock elsewhere, including errata. The location of errata parking is recorded in the census, and these locations, including their "utilization" (the number of bicycles parked at each distinct errata site), is compared to the locations and utilization of bicycle racks. A key deliverable of the census research will be a report, per each building's entrances on the surplus or deficit of bicycle parking supply.

The occurrence of errata, or bicycle not parked in racks, plays an important role in evaluating bicycle parking supply. Sites on campus with significant errata counts are suggestive of an under-supply at least during peak demand. Building entrances will be associated with building occupant types, which will then be compared to census counts (estimated to demonstrate peak demand).

The bicycle parking research plan hypothesizes that bicycle racks are consistently placed insufficiently close to destinations (often building entrances), thus generating high levels of errata. This research draws upon the census data for populating errata and parking figures.

Code Development

As the campus develops to sustain transportation systems supporting a diverse set of modes for accessing campus, codes specific to bicycle amenities may be required. Such code will include guidance for new construction as well as renovation or retrofit of existing construction. Census data will be instrumental in providing "existing conditions" or "benchmark" data. It will allow for adjustment of established standards to the specific environs of the CU-Boulder and its users' behaviors. As an example, the US Green Building Council's LEED standards require a percent of new construction's occupancy to be supplied with bicycle parking. By comparing the CU-Boulder campus' average supply utilization rates, we may know if LEED's standards are feasible, unrealistic or weak. External data, not gathered during the census, that will add in subsequent analysis and code development includes building occupancy rates, building occupancy types (classroom, office, lab) and national standards.