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véLo-CK

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Presenter Information

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véLO-CK*

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Mentored by Soheil Zarrin and Anthony Levenda

Problem/opportunity

Portland is known as Bike City U.S.A for its promotion of a eco friendly method of transportation and support of biking infrastructure. Although our city has this progressive reputation, there is a negative aspect of a bike-loving city that has not received attention. The Oregon Household Activity survey in 2011 states that “about 29 percent of adults in Multnomah, Clackamas and Washington counties own a bike”. As more people has decided to commute with bikes, theft has increased dramatically. According to the Portland Police Bureau, “Portland thieves last year took more than 2,100 bikes worth well over \$1 million combined”. In an attempt to solve this problem, the police bureau has proposed to create a task force to patrol areas of possible bike theft. Although this is a step in the right direction, it is not a realistic solution to this problem. The cost to employ more policemen to patrol the city would be high and most of these crimes are not prosecuted by in court.

We talked to people who have experienced bike theft in Portland. Kimberly K said “I didn’t understand how they could have stolen my bike because I had a cable lock. I was really angry and was afraid my insurance wouldn’t pay for it.” John B said “I didn’t have enough money to buy a new bike and I didn’t buy bike insurance so I couldn’t buy a bike for over a year.”

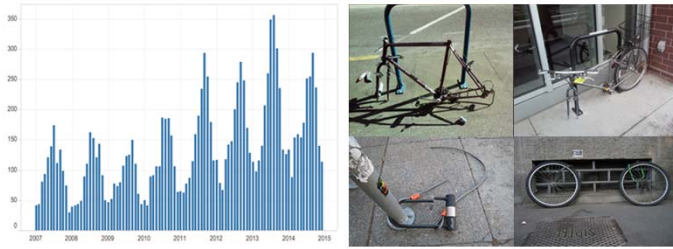


Figure 1: Frequency of Bike Thefts in Portland

Timeline

We started the brainstorm process by just writing down ideas as they came to us. We each had a small stack of sticky notes, and covered a wall in different ideas. Then, we wrote all the ideas down, and voted on them to find the top ideas. To evaluate these ideas, we applied the design process introduced by Soheil and Anthony. Using idea screening, we evaluated different factors for each idea to decide the top ideas. After these evaluations, our top two ideas were, very roughly, night vision for bikers or a system to help get amenities to homeless people. Anthony raised concerns about how the homeless is a fragile community, and doing studies would require permits. As a result, we decided to investigate night vision for bikers. Upon looking through current ideas for night vision, it seemed that most of our ideas were already on the market. As a result, we looked into other problems with bikes and biking, through surveys and research. We finally settled on locking and stealing bikes, and came up with many different ideas on this topic. These ideas converged to create the véLO-CK.

Our Solution

Dimensions

Bike wheel diameter range: 16 to 26 inches
Space in between spokes: 91 to 160 mm
Range of normal bike frame lengths (people of heights 4’11” to 6’4”): 13 to 23 inches
Material: steel or iron

HOW MUCH DOES IT COST TO REPLACE A BIKE TIRE?

Cost of tires:

\$25 - \$65 (performancebike.com)

Cost of wheels:

Anywhere from \$80 - \$1000+ (performancebike.com)

COST OF BIKE RACK MATERIALS

If we are to make our bike rack out of a metal, such as steel and iron, here are the current prices:
The current, as of 27-Mar-2015, price of steel is 295.0 dollars per tonne. (approx. 14-15 cents per pound)
The current, as of 30-Mar-2015, price of iron is 52.9 dollars per tonne. (approx. 2-3 cents per pound)

Figure 2: Bike Dimensions

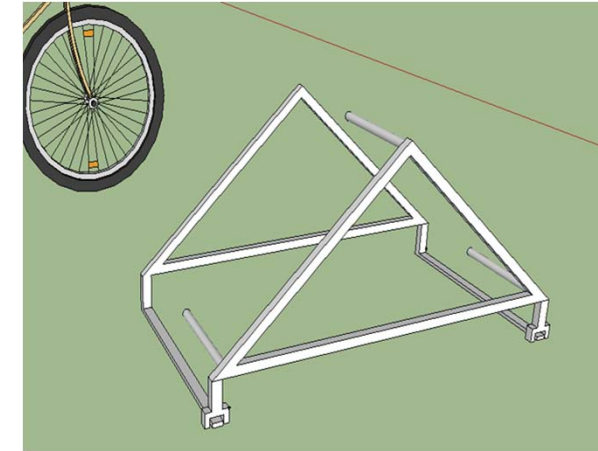
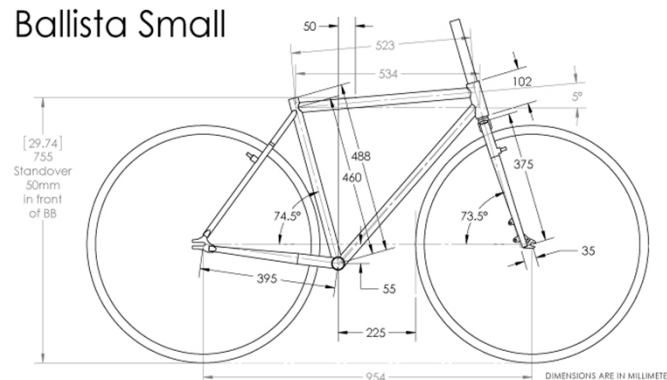


Figure 3: Google Sketch-up Design

Conclusions

Advantages of our solution:

- Novelty
- includes simple, easy to use design for all ages
- has few moving parts
- Protects both frame and wheel in one mechanism
- Built into cities so no need for multiple locks that one needs to carry with them
- Usefulness:
- Protects and secures bike frame and wheels better
- Cheaper:
- Use a similar amount of metal as other racks
- Fewer thefts lead to fewer repairs

Future extensions:

- Expanding into other cities
- Make mechanical/electric
- Could beep when cut or someone attempts to steal a bike
- Could lead to fewer thefts which would limit the need for monitoring
- Also could lead to more daily commuters using bicycles

*Vélo is bicycle in French