Analysis of a University Bike Sharing Program

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Bike Share Programs

Bike map from http://www.bikesharingmap.com/
Pictures from thechicagolifestyle.com, wikipedia.org,
www.insideindianabusiness.com, and cvilletomorrow.org
Purdue’s Bike Share Program - Zagster

www.twitter.com/zagster
How it Works

Join
$25 annually

Enter Bike #

Unlock Bike and Ride

Return Bike to Rack

Pricing
MEMBERSHIP FEE
$25 billed annually

Rides shorter than 3 hours are FREE
(6 hours on weekends)

Membership Options
Yearly Membership
24 Hour Pass
Promotional Membership

MEMBERSHIP FEE
$25 billed annually

Trips under 3 hours are FREE (6 hours on weekends)
then pay $2/hour
up to $10/ride

Confirm End Rental?
Your bike must be locked to a Zagster dock before you end your rental.

No
Yes
Bike Rack Locations

- 13 bike racks on campus
- Capacity ranges from 6-12 bikes
- Bikes secured with U-bolt, key for which is in lockbox on back of bike
The Quick Numbers

646 Users

77 Bikes

15K Rentals

22K hrs Total Duration

425 Most rentals by a user

1058 hrs Highest total duration by a user
Total rentals and duration for each bike

Bike #14 has highest rentals and duration
Hours of use by bike

Pareto chart

45 bikes
Rentals by User

User: c0733c43  
425 rentals

User: 7db0a300  
417 rentals

135 users had 1 rental
Rentals over the study period by top user

30 Oct
15 rentals
First rental at 03:51 AM!!

User on Oct 30, 2015

Not Riding  Riding

Checks back in for 15 sec
Checks back in for 19 sec
Checks back in for 8 sec
Users who check in and check out near the 3hr mark

- Rides that lasted 2.5 to 3.1 hrs
- Checked in and out within 5 mins

9 users (1.39%) did this more than 50 times

139 users or 21.5% of all users
Challenges in Implementation

GPS Fence
Unique bikes in use per day, out of 77

- Average: 28.1 (of days with use)
- Average: 22.9 (all days)

Peak usage: 52 bikes

- Trial period
- Official launch
- Classes begin
Unique bikes rented per day and hour, out of 77
Unique bikes rented per day and hour, Aug

Classes begin
Unique bikes rented per day and hour, Sept

- **Family weekend**
- **Best month of usage**
Unique bikes rented per day and hour, Oct

Temperatures drop below 50
Unique bikes rented per day and hour, Nov

- Temperatures in the 60’s F
- Temperatures drop below 50 F
- Snowstorm
- Thanksgiving

Temperatures in the 60’s F
Temperatures drop below 50 F
Snowstorm
Thanksgiving
Cumulative plot of rental duration

- 96.9% return before 3 hours
- 97.6% return before 3:05
- 82.5% return by 2:45
- 27% return after 16 mins
- 11 rentals > 24 hours
  Max: 76 hours

Cumulative Charges
- Daily Charges
- Extra Charges
- Cumulative

Family weekend
Average Bikes in Use by 15-min periods since Aug. 1

Peak use in late afternoon

Similar usage Monday-Friday, less usage on weekends

Bikes in use even overnight
Cumulative Days Unused by Bike since Aug. 1

Bar only shown when bike is unused for at least 7 days

- **Bike ad4d85a2**, up to 100 days
- **Bike 26f8bcc0**, up to 69 days
- **Bike 1c5ded65**, up to 81 days
Challenges in Implementation
Challenges in Implementation
Lessons Learned - Maintenance

![Image of a bike that is currently unavailable due to maintenance issues.]

Start a Ride

ENTER THE BIKE NUMBER

2095

START RIDE

This bike is currently unavailable.

OK
Lessons Learned - Support

I cannot lock my bike
Troubleshooting
Mobile App
Using Zagster Bikes
About Zagster
Billing & Account Management

Submit a request
My requests

What do I do if I cannot lock my bike?

1. Don’t panic
2. Refer to the troubleshooting tips below. Sometimes it simply takes another try.
3. If all else fails, please call 202-999-3924

*Whatever you do, please do not leave the bike unlocked.
Lessons Learned – Geo Fencing
Future Research

• GPS data
  • Origin-destination study
  • Locate demand
  • Understand usage patterns

• Weather integration
  • Explain anomalies in usage

• User feedback surveys