Fresh Pond Reservation Census Program

Data Collection Summary, 2011 - 2012

Cambridge Water Board Presentation 3/13/2013

Purpose

To better understand and document user groups, patterns, and numbers in Fresh Pond Reservation

Quantifying users will help managers target and allocate resources, develop conflict minimization strategies, and prioritize “on-the-ground” improvement projects

Approach

Staff and volunteers periodically conduct surveys near sensors for user characterization & sensor validation

Adopt technology that allows for unattended counts of Fresh Pond Reservation users.

Staff and Volunteer Surveys: Census Information Collected

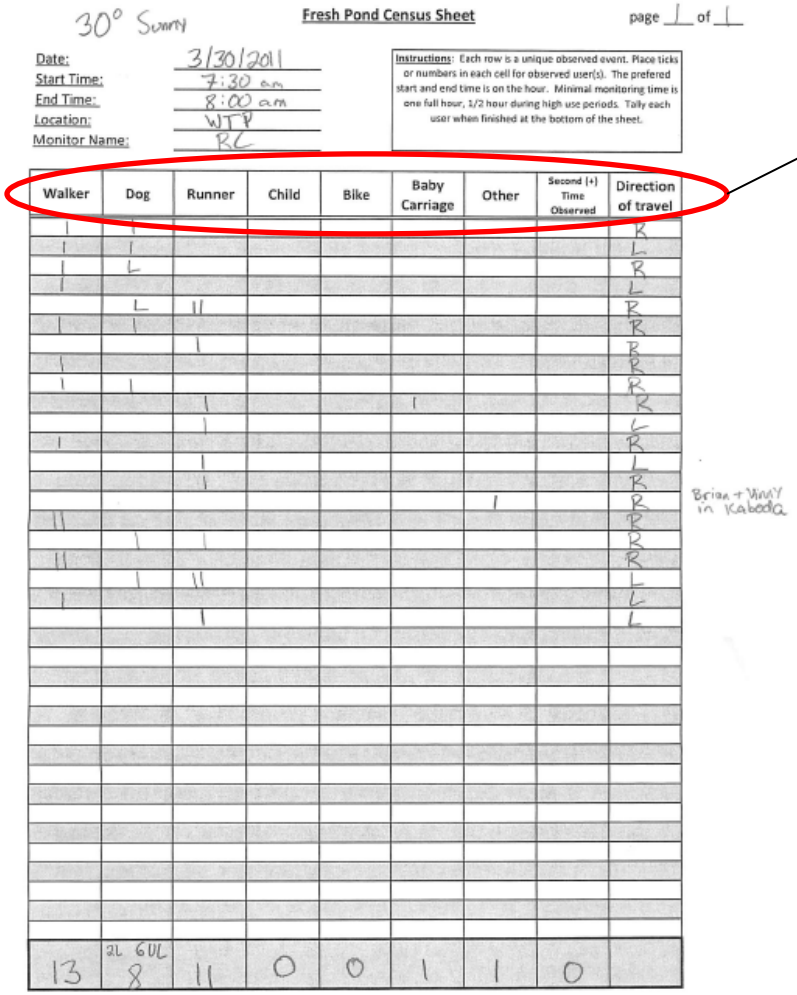
Surveys

- Pedestrians (Runners, Walkers)
- Dogs (on and off leash)
- Bikers
- Children
- Direction of travel

Unattended Eco-Counters

- Direction
- Count of living things > 3ft tall

Sample Survey



30° Sunny

Fresh Pond Census Sheet

page 1 of 1

Date: 3/30/2011
Start Time: 7:30 am
End Time: 8:00 am
Location: WTP
Monitor Name: RC

Instructions: Each row is a unique observed event. Place ticks or numbers in each cell for observed user(s). The prefered start and end time is on the hour. Minimal monitoring time is one full hour, 1/2 hour during high use periods. Tally each user when finished at the bottom of the sheet.

Walker	Dog	Runner	Child	Bike	Baby Carriage	Other	Second (+) Time Observed	Direction of travel
13	2L 6UL 8	11	0	0	1	1	0	

Brian + Vinny in Kabodia

*mark tallies in bold cells above

Users/Direction

Each row is a unique observed event

Groupings are counted in one row

Tallies at bottom

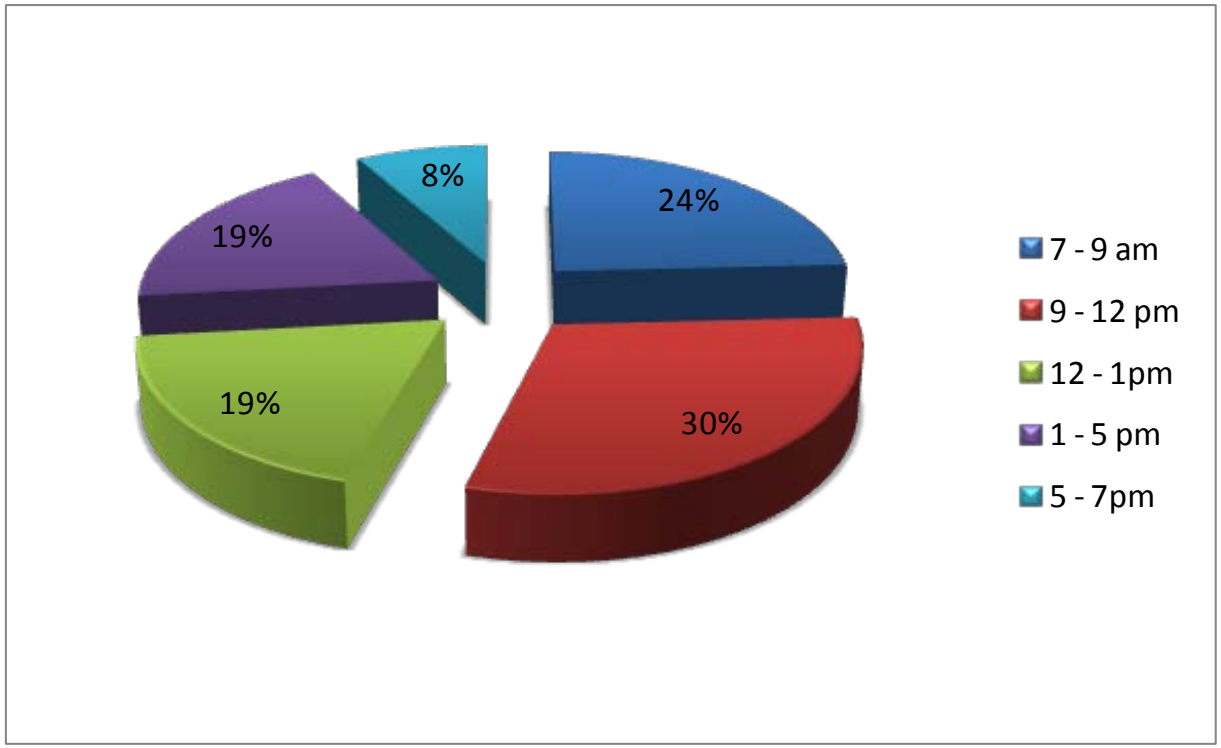
Information entered into spreadsheet for analysis

Summary Survey Data

- 107 survey-hours conducted between 2/14/2011 & 10/21/2012
  - 50.16 hours at LFP
  - 57 hours at WTP
- Survey duration ranged from 0.5 to 2.25 hours
- Surveys conducted primarily during weekdays
- Surveys were conducted at various times, on different days

Survey Data Results

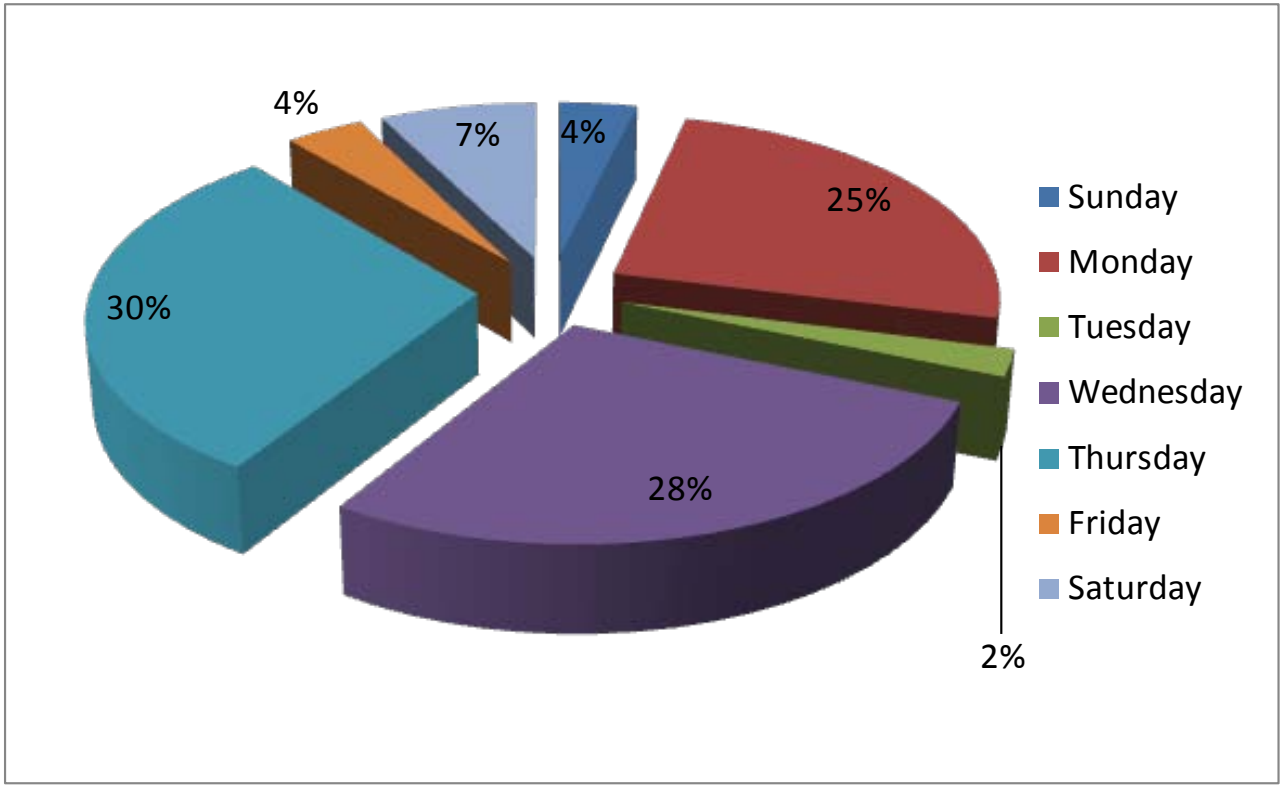
Surveys by Time Period



7 - 9 am	9 - 12 pm	12 - 1pm	1 - 5 pm	5 - 7pm
26	32.33	20.33	20	8.75

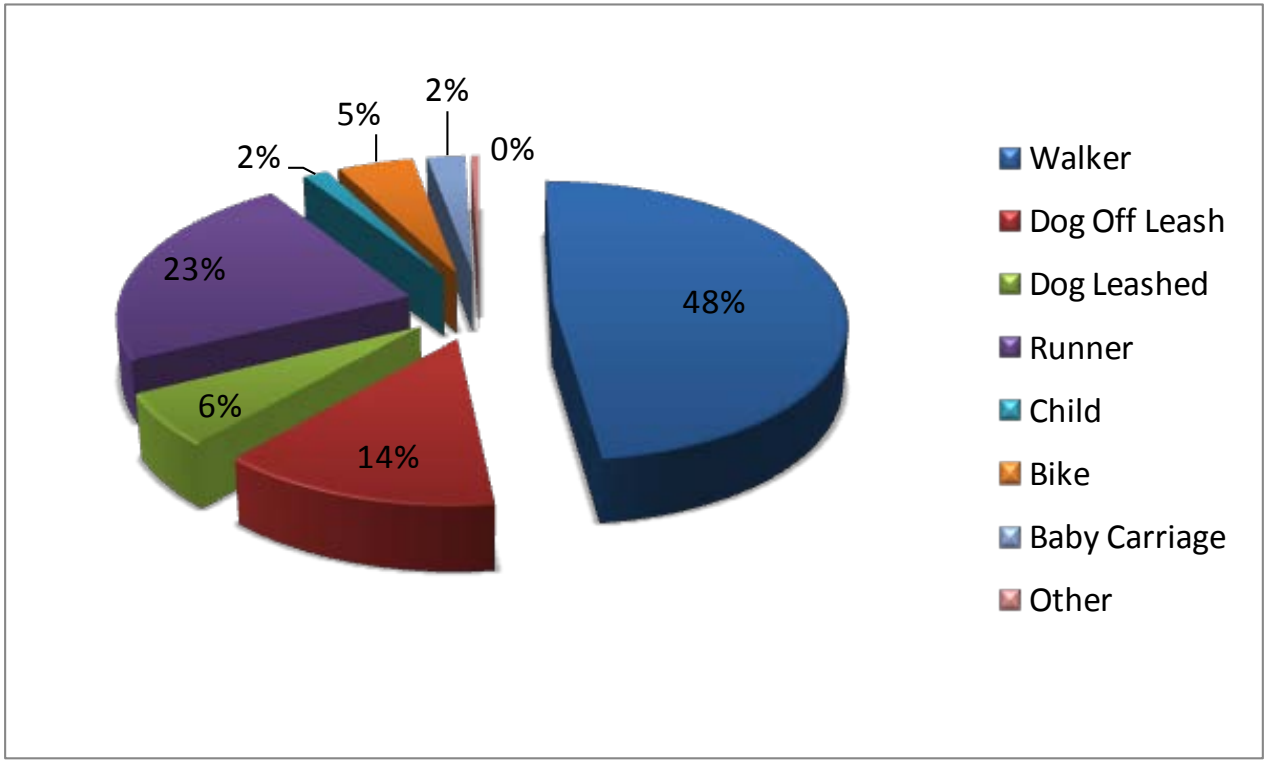
Survey Data Results

Surveys by Day of the Week



Survey Data Results

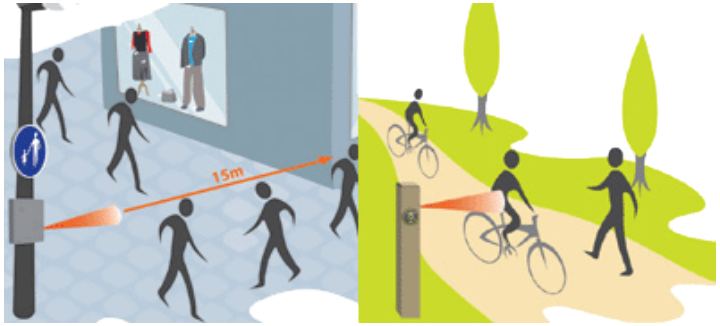
All Users, All Surveys



Walker	Dog Off Leash	Dog Leashed	Runner	Child	Bike	Baby Carriage	Other
6,286	1,766	788	3,022	200	628	314	65

Adopting Technology: Eco-Counters

- http://www.eco-compteur.com/
- "Worldwide leader in monitoring pedestrians and cyclists in urban and natural environments. Over 5,000 counters are currently running in 30 countries."
- "The PYRO sensor uses a combination of passive infrared pyroelectric technology and a high precision lens to detect a change in the detected temperature when a person passes in the range of the sensor."



Counter Locations

Fresh Pond Reservation - Eco-Counter Locations

Eco-Counters:
Census Information Collected

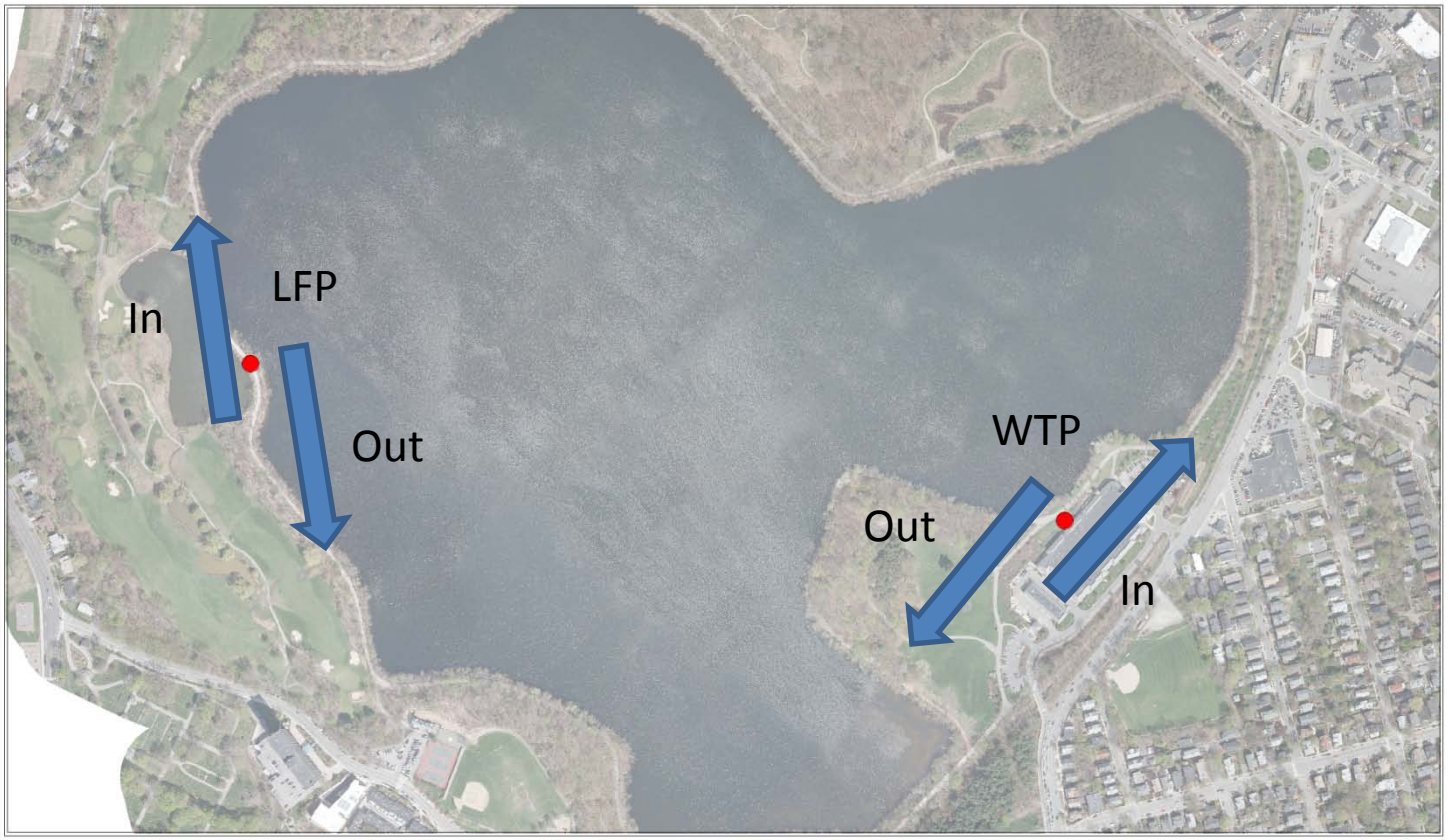
Surveys

- Pedestrians (Runners, Walkers)
- Dogs (on and off leash)
- Bikers
- Children
- Direction of travel

Unattended Eco-Counters

- Direction
- Count of living things > 3ft tall

Eco-Counter Results



Fresh Pond Reservation - Eco-Counter Locations

Eco-Counter Results - Highlights

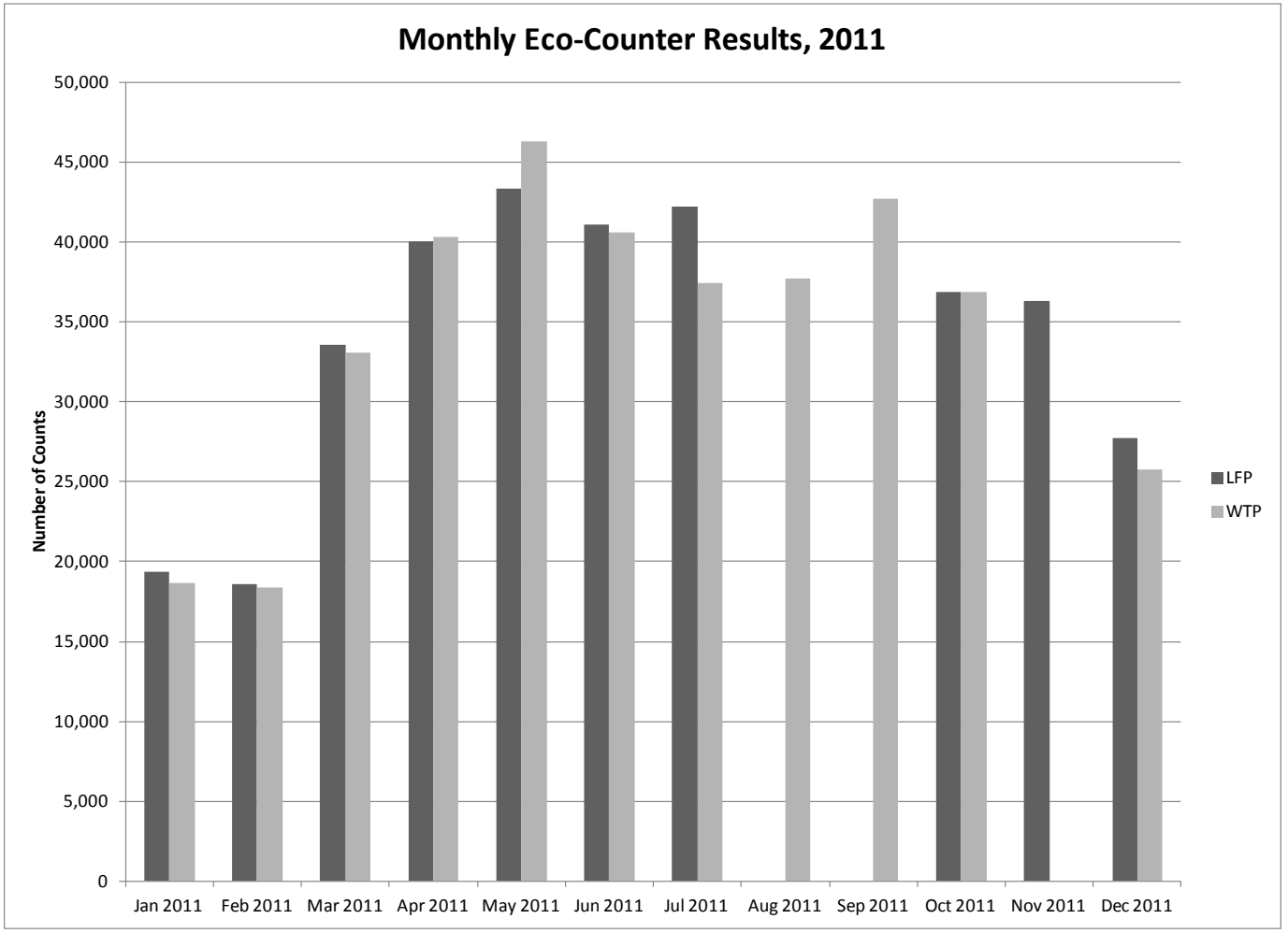
- In 2011 ~411,000 counts
- In 2012~405,000 counts

(More expected as November was a partial record)

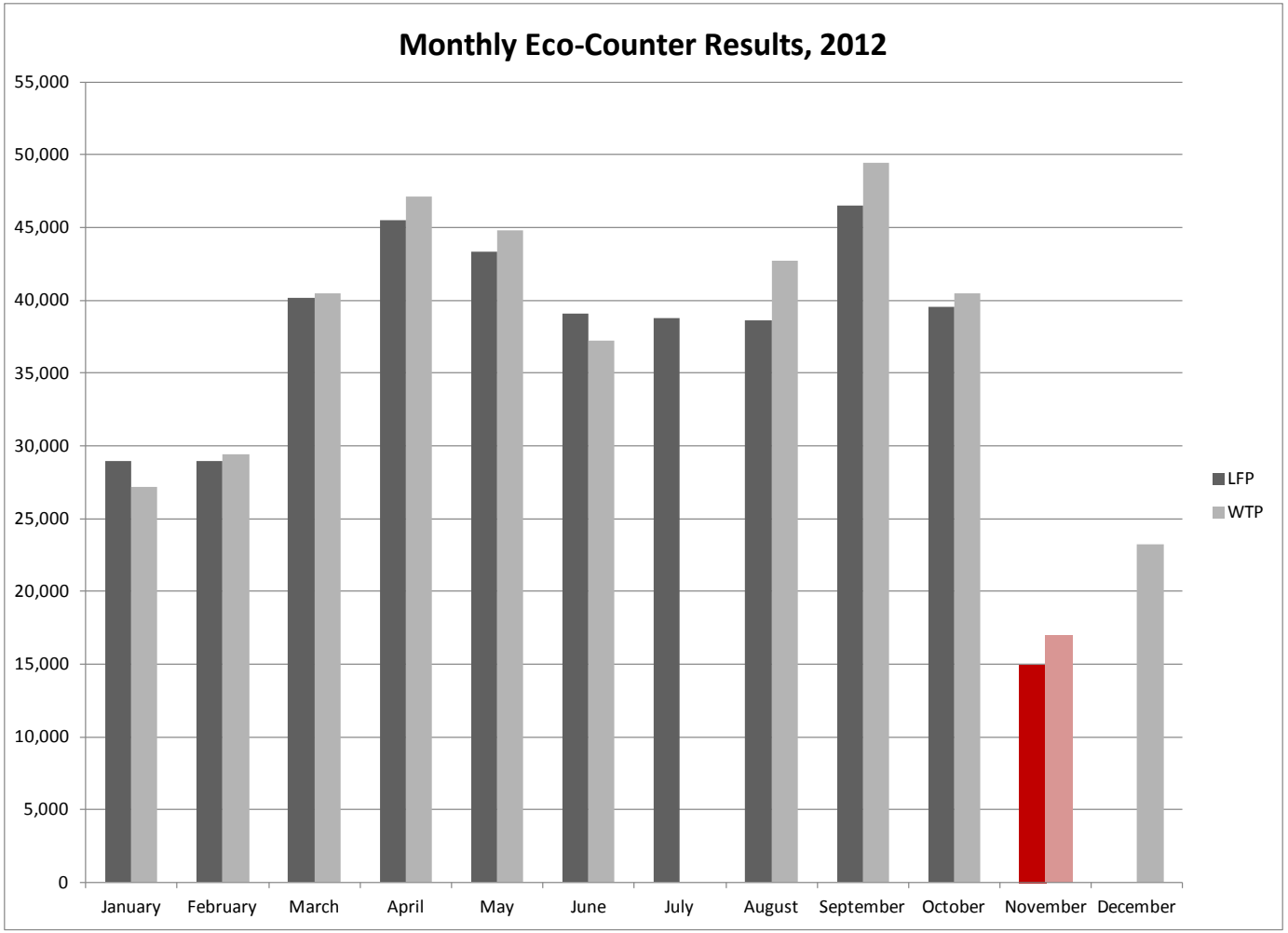
- In 2011, average monthly counts = 34,000
- In 2012, average monthly counts = 38,000

- In 2011, average daily counts = 1,100
- In 2012, average daily counts = 1,100

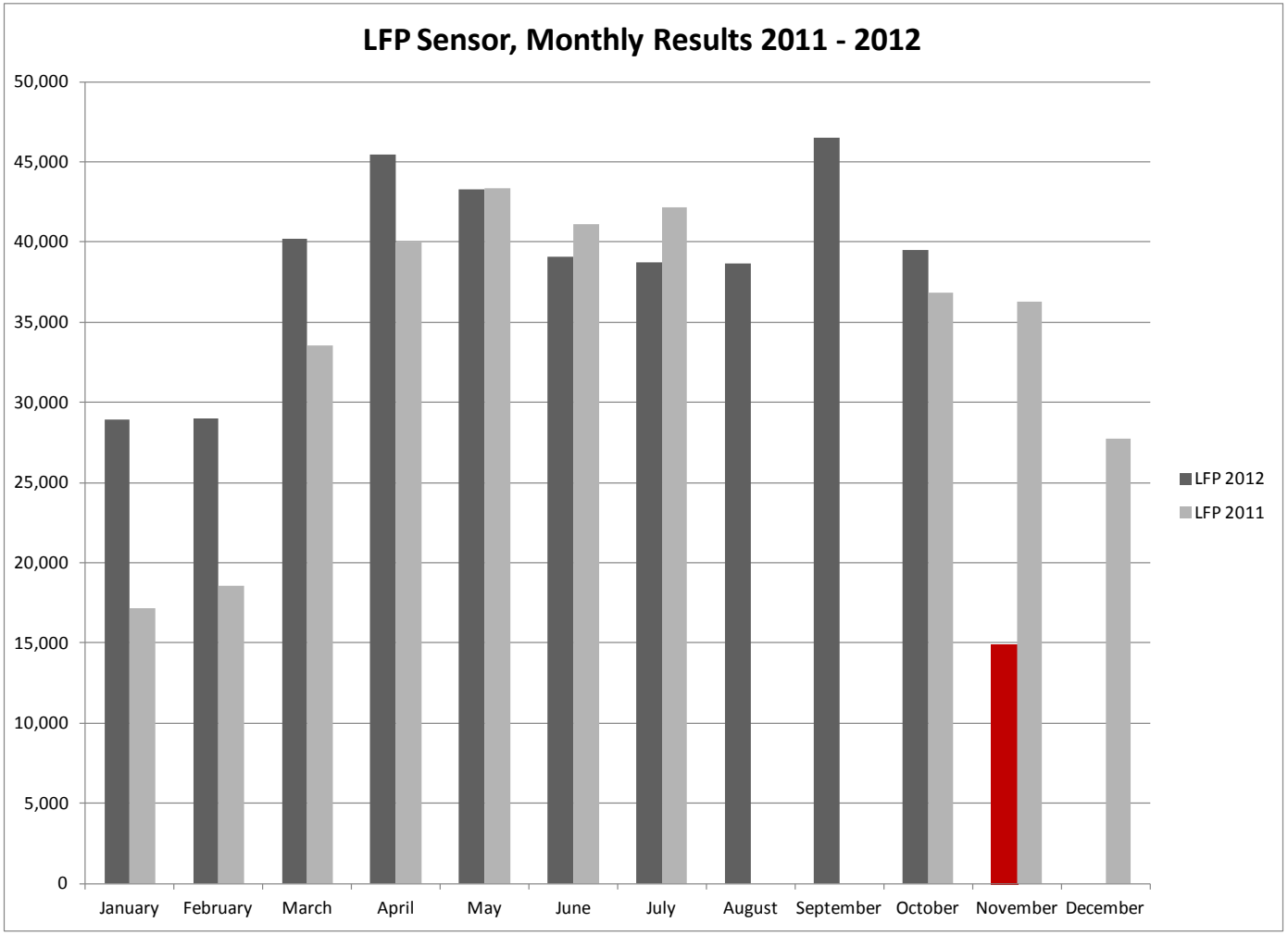
Eco-Counter Results – Monthly Patterns



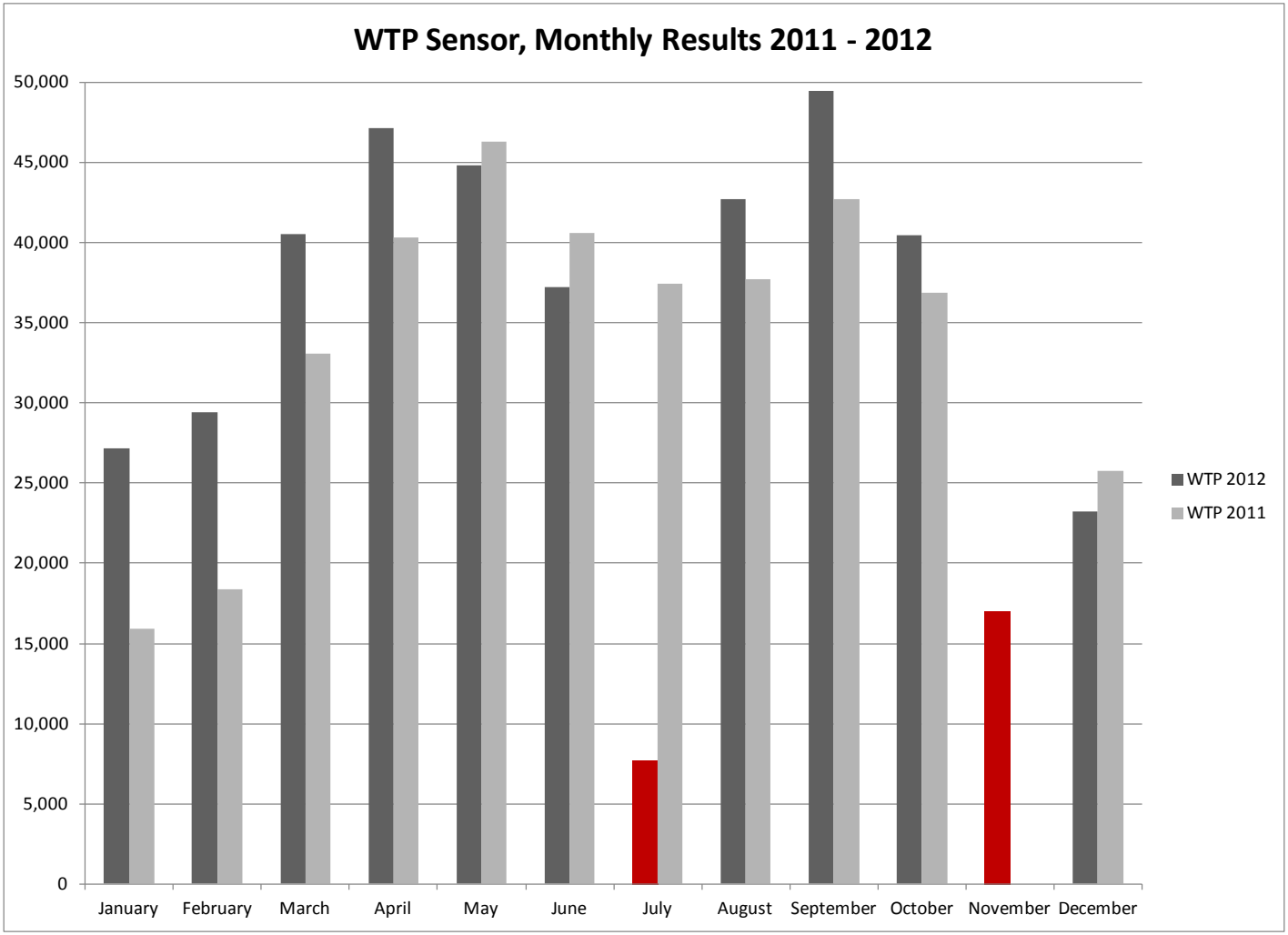
Eco-Counter Results – Monthly Patterns



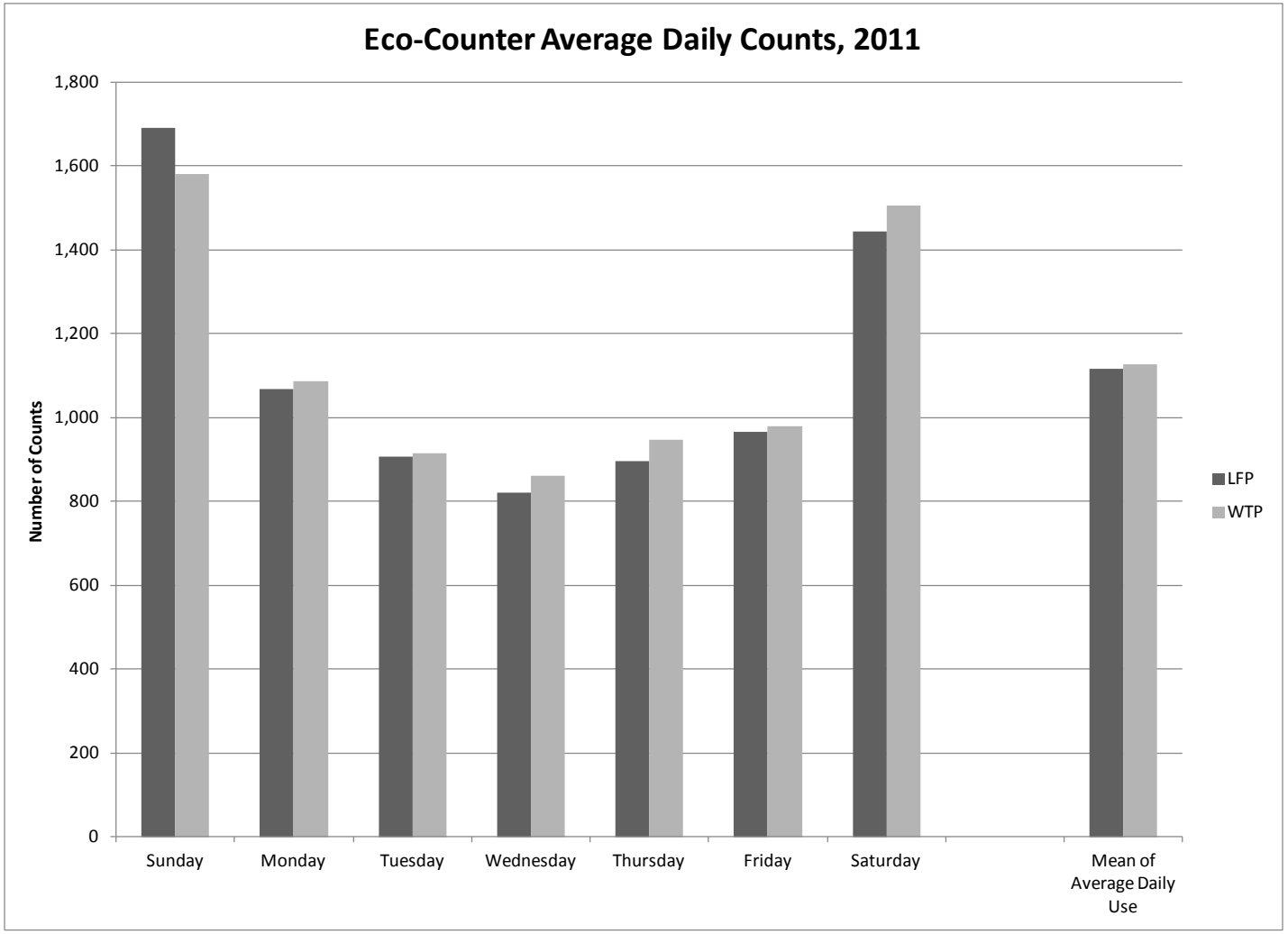
Eco-Counter Results



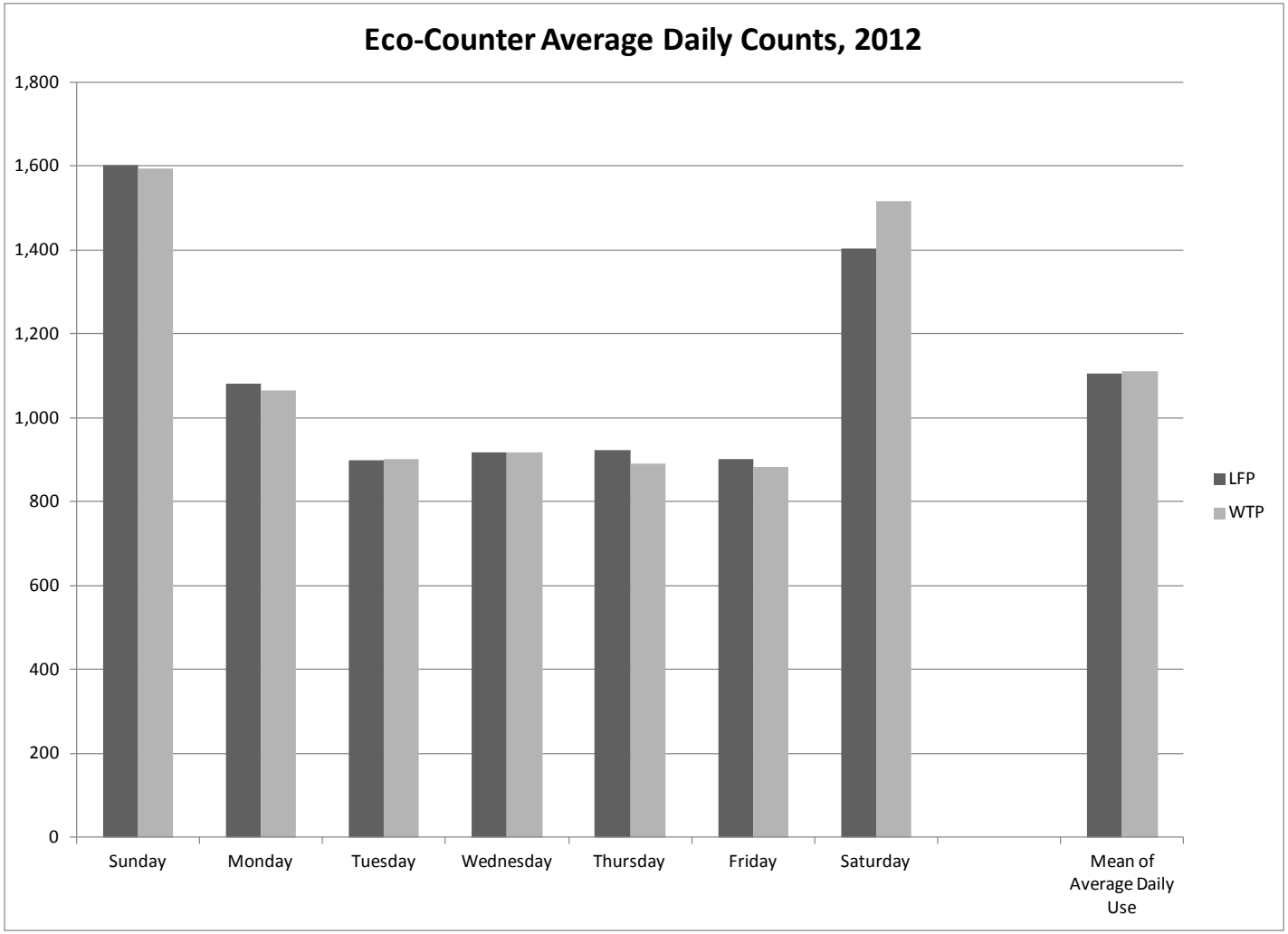
Eco-Counter Results



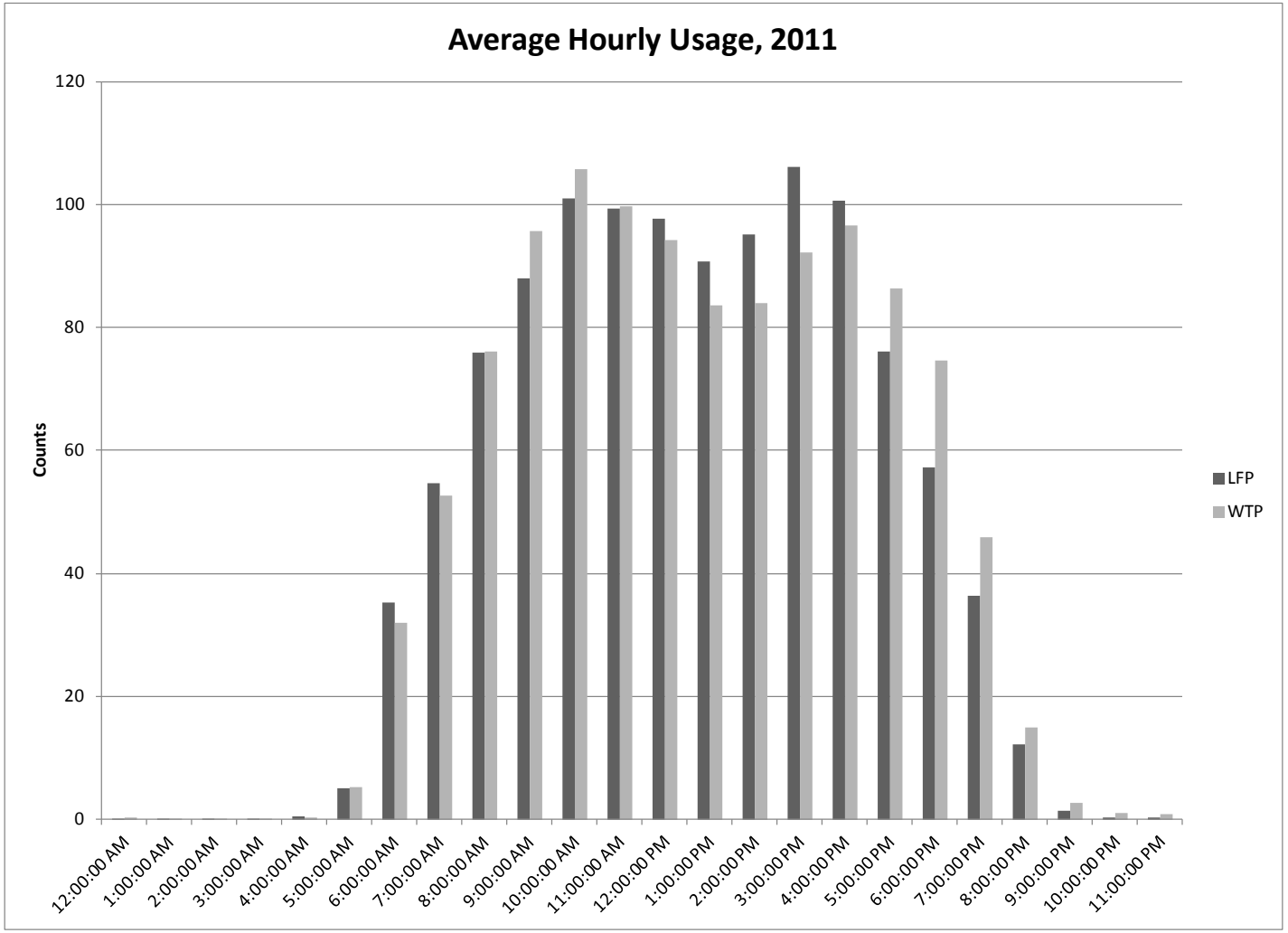
Eco-Counter Results



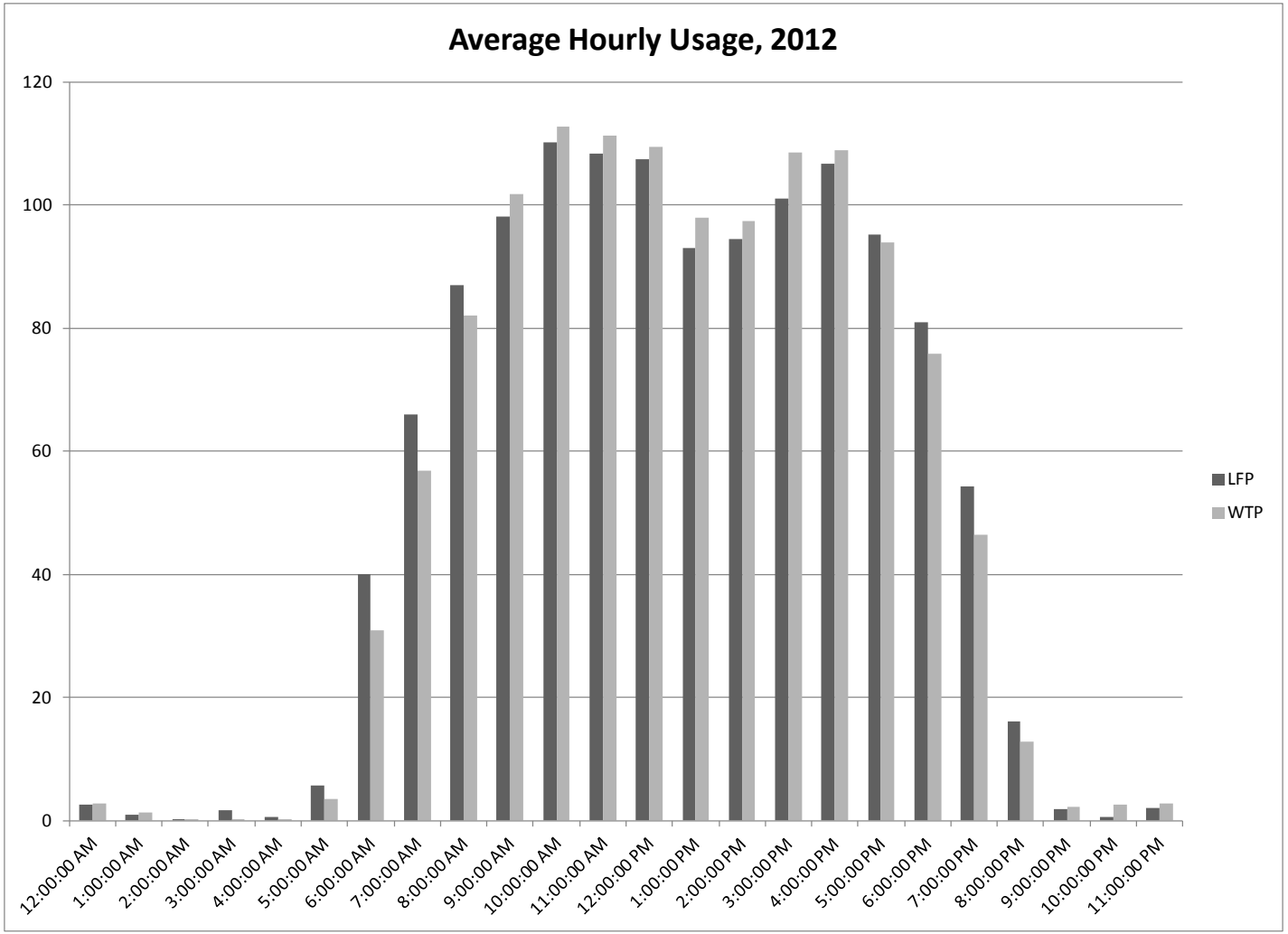
Eco-Counter Results



Eco-Counter Results



Eco-Counter Results



Data Quality Control

- Sensors downloaded weekly, data screened for anomalies
- Sensor data compared to survey data
  - Running average error between sensor and surveys is ~10%
  - Majority of difference between observed (surveys) vs. measured (sensors) can be explained by paired users
  - Confirms directional capabilities
  - ~80% of the time, the sensors ***underestimate*** observed survey counts
- ***Sensors are a conservative estimate of total usership***

Eco-Counter Limitations

- LFP sensor malfunction end of July, 2011
  - Pulled for repairs 8/22/11
  - Re-installed 9/28/11
- WTP sensor offline in November, 2011
- WTP sensor failed July, 2012 again November, 2012
- LFP sensor failed mid-November 2012

Future Projects

- Install new sensors at major entrances
- Track long term trends
- Upgrade to web-based system to increase information access
- Conduct more, targeted user surveys
- Compare weekday to weekend surveys to identify potential differences in user make-up
- Use information to focus Shared Use implementation plans

Proposed Monitoring Locations