Chittenden County Bike Share Feasibility Study

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Purpose: To begin evaluating the feasibility of a bike sharing program in the greater Burlington Vermont area.

1. ACKNOWLEDGEMENTS

Thank you to the Chittenden County Regional Planning Commission and its member communities for funding this research. Thank you to Local Motion volunteer researchers Silas Bronson and Kyle Gaffney and UVM affiliates Luis Vivanco and Jesse Simmons who helped with the report.

2. STUDY APPROACH:

This is a preliminary feasibility study for bike-sharing in Chittenden County. It is not intended to be an exhaustive report with significant independent research, but an initial overview of bike sharing trends, costs, opportunities and challenges. It is intended to assist policy makers in Chittenden County determine whether they would like to further pursue this opportunity.

In addition to extensive online research, we made the following contacts:

- Visited the Bixi system in Montreal on October 26, 2010 with 10 Burlington area leaders and met with Bixi staffer Kevin Grant
- Participated in a May 26, 2011 webinar on Bike-Sharing put on by the Association of Pedestrian and Bicycle Professionals
- Talked with UVM Parking & Transportation Services Director Jim Barr and student Jesse Simmons about the UVM bike share effort
- Spoke with Lee Jones, Director of Sales with B-cycle
- Met with Eric Camp from Collegiate Cycles in August 2010

3. WHAT IS BIKE SHARING?

Bike Sharing is an operation that provides a number of bicycles for shared use as a means of transportation in relatively high density areas. Bike-sharing services are operated by a range of entities including community groups, individual campuses, large employers, governmental entities (often through a public/private partnership), and private companies.

4. POTENTIAL IMPACTS OF BIKE SHARING

Bike Sharing, if successfully implemented, can achieve the following outcomes:[1]

- Offer greater mobility for residents and visitors
- Increase the use of other sustainable transportation modes including transit and walking.[2]
- Increase health of area residents[3]
- Reinforce the community's position as a leader in innovate and quality of life
- Reduce traffic congestion leading to quieter, safer and more livable streets
- Reduce carbon emissions (Green House Gases)

Bike Sharing, if not optimally implemented or well-utilized, can

- Divert resources from other transportation priorities
- Fail to achieve the many potential benefits listed above

5. BIKE SHARING EVOLUTION

Bicycle sharing systems can be divided into three general categories described below.

First Generation: Unregulated Community Bike Share:
The unregulated bike sharing efforts are often established by bicycle enthusiasts and community groups. The first such system was the 'White Bike' system established in Amsterdam in 1965.[4] Defining features include:

- Free and unrestricted access to bicycles
- No monitoring system
- Low-tech
- Volunteer-driven
- Often managed by loose-knit community groups or organizations

Pros:

- Inexpensive to start
- Harnesses the energy of area bicycle enthusiasts

Cons:

- Overly reliant on volunteers
- Theft and damage usually decreases bike fleet quickly
- Unsustainable model

This approach has been tried extensively in Europe and North America without much success. Theft, volunteer fatigue and insufficient systems have led to the quick demise of most start ups. It is commonly understood that this model has not proved successful.

Burlington and UVM both tried this model and the projects did not last long. Burlington's Polka Dot Bike program (1990's) and UVM's Yellow Bike Program (2006) both fizzled soon after start up. Setting up the programs attracts volunteer interest, but few want to deal with the operational challenges of such systems day in and day out.

Second Generation: Low-tech Regulated Bike Share Systems

The next level of bike sharing systems is commonly found on college campuses where there are many locations with staff who can help operate the program. Defining features include:

- Affiliates of the college or institution must sign up to participate
- Bicycles secured with keyed locks
- Sign out bicycles from an authorized staff person
- Often managed and subsidized by a college department

Pros:

- Less expensive than a fully automated system
- Can work well in large institutions where there is only one entity to manage system

Cons:

- Limited applicability at large, supportive institutions
- Reliant on staff in various locations to interact with customers and deliver consistent service

UVM and Champlain both launched their own second generation bike share initiatives in 2010/2011 academic year.

- UVM Bike Share: http://www.uvm.edu/sustain/tags/bike-share
- Champlain: No online presence yet

Third Generation: Smart Bike Sharing Systems:
A new stage of bike sharing started with the introduction of higher capitalized systems with computerized docking stations. Smart Bike Sharing systems are still relatively new and limited to larger metropolitan areas. Defining features include:

- Fully-automated, self service system
- Bicycles secured by electronic locking mechanisms at docking stations
- Often managed by governments, large universities and public-private partnerships

Pros:

- A turn-key system
- Automated operation reduces ongoing staffing needs
- Is a highly visible and attractive service

Cons:

- Expensive to set-up and operate
- Still unclear as to whether this model can be sustained in smaller cities

6. SMALL CITY INSTALLATIONS

Some small third generation automated systems have been installed in small communities. Places with less than 10 stations are either specifically serving a campus or a special niche in the community.

- Boulder, Colorado -- 13 stations, B-cycle
- Madison, Wisconsin -- 350 bikes, 35 stations, B-cycle
- Golden, Canada – 15 bikes, 2 stations, Sandvault

- Spartanburg, South Carolina -- 14 bikes, 2 stations, B-cycle
- UC Irvine (campus only) -- 24 bikes, 4 stations, Zotwheels
- Washington State University (campus only) -- 52 bikes, 4 stations, Bixi

Boulder's bike share system is set up as a non-profit corporation. This model may be worth exploring in Vermont.

7. ESTIMATED COSTS

Capital Costs:
The initial capital costs to set up a third generation system range from $3,000 to $5,000 per bicycle. The smaller the installation, the higher the initial per-bike capital cost. As a result, we recommend the Chittenden County region use a figure of $5,000 per bicycle for planning purposes. For a proposed 100-bike installation in the greater Burlington area, the estimated capital costs would $500,000.

Smaller communities that have set up their own third generation systems with consultants have been able to set up systems for closer to $3,000 per bicycle (Irvine and Golden for example). Based on our research, these systems have not yet proven themselves to be sustainable long term. Therefore we are recommending the higher end of the range to establish a viable system. These smaller systems do hold promise, but longer track records are needed. After many years, Irvine's campus bike share has only 109 members. Golden's bike share just started in 2011.

Bike-Share Program Costs:

Bike-Share Capital Costs

City	Montreal	New York	Washington DC	Lyon	Paris
Program	Bixi	2007 Estimate	SmartBike Expansion	Velov'	Velib'
Operator	Stationnement de Montréal	ClearChannel Adshel	ClearChannel Adshel	JCDecaux	JCDecaux
Number of Bicycles	2,400	500	500	1,000	20,600
Capital Cost	No Data	$1,800,000	$1,800,000	No Data	$90,000,000
Capital Cost/Bicycle	$3,000	$3,600	$3,600	$4,500*	$4,400

All data provided by the operators or providers unless otherwise noted.

* This figure is cited to European programs in general in Becker, Bernie, "Bicycle-Sharing Program to Be First of Kind in U.S.," The New York Times, 27 April, 2008

The table above is from p.130 of the publication: Bike Share – Opportunities in New York City, NYC Department of City Planning, Spring 2009

Operating Costs:
Operating costs include maintenance, distribution, staff, insurance, office space, storage facilities, website hosting and maintenance, and utilities. A 2009 study review of bike-sharing

systems estimated an average operating cost of about $1,600 per bicycle.[5] For a 100 bike installation, the estimated annual operating costs would $160,000.

Bike-Share Operations Cost

City	Montreal	Lyon	Barcelona	Washington DC	Paris	New York
Program	Bixi	Velov'	Bicing	SmartBike Expansion	Velib'	2007 Estimate
Operator	Stationnement de Montréal	JCDecaux	ClearChannel Adshel	ClearChannel Adshel	JCDecaux	ClearChannel Adshel
Number of Bicycle	2,400	1,000	3,000	500	20,600	500
Operations Cost	No Data	$1,550,000	$4,500,000	$800,000	$35,000,000	$972,000
Operations Cost/ Bicycle	$1,200	$1,500*	$1,500**	$1,600	$1,700	$1,944

All data provided by the operators/providers or the city unless otherwise noted.

* Buhrmann, Sebastian, Rupprecht Consult Forschung & Beratung GmbH, "New Seamless Mobility Services: Public Bicycles;" Niches Consortium

** Nadal, Luc, "Bike Sharing Sweeps Paris Off Its Feet," Sustainable Transport, Institute for Transportation and Development Policy, Fall 2007, Number 19

The table above is from p.130 of the publication: Bike Share – Opportunities in New York City, NYC Department of City Planning, Spring 2009

6. KEY FINDINGS:

Population density needed. Bike sharing has only shown to work in high density locations. Until the transportation network dramatically changes, Burlington / Winooski are likely the only viable communities in Chittenden County to consider bike sharing in the near future.

Good seamless bicycle facilities needed. In-town bicycle facilities are necessary to make practical trips appealing to a cross section of users of varying abilities. If the region wants to make bike sharing work in the urban core, continuous bicycle facilities must be completed.

Small systems do not work beyond campuses. A significant number of bikes and stations are needed to make a town-wide system viable. Small systems can adequately serve niche markets (public parks, campuses, etc.) but do not deliver substantial mobility benefits to the broader public. Bike sharing consultants estimate Burlington would need about 100 bikes at approximately 15 stations to get a system started.[6]

Systems must appeal to many user groups. To be successful, Bike-share programs must used by a wide variety of people. Commuters, recreational/errand riders, and tourists are the three main user groups.

Viability of bike-sharing in smaller communities still unclear. Bike-sharing in smaller North American metropolitan areas is still relatively new and the long-term viability has yet to be proven.

Further innovations are forthcoming. With third generation bike share systems still in their early years, future innovations should drive down the capital cost to implement bike sharing systems and the make systems more accessible to the public. Inclusion of electric-assist bikes into bike share fleets offers the potential to give more people comfort to use the system.

8. IS BIKE SHARING VIABLE IN OUR REGION?

The quick answer for the short term is potentially. Looking at Chittenden County's core, there are a number of barriers and opportunities:

There are a number of barriers in Burlington / Winooski:

- **Hilly topography** – much of the desire lines for students and visitors have significant hills to climb. It's possible that the future introduction of electric-assist bicycles into bike sharing fleets could address this issue.
- **Small population base** – most third generation bike sharing ventures have been installed in much larger cities with higher densities.
- **Limited operational funding** – Vermont struggles to find ways to maintain its existing transportation infrastructure. As other smaller communities have shown, revenue from the bike share will not offset a majority of the $160,000 in annual operational expenses. As such, a significant source of annual funding for this project must be secured. Furthermore, Vermont's statute prohibiting advertising in public rights of way takes off the table a funding stream that other communities have used.
- **Relatively severe winters** – with the heavy use of salt on the roads, the likelihood of damage from plows, and the difficulty of keeping the bicycles accessible, we'd recommend removing the bike-share service seasonally and replicating Bixi's 7-month season in Montreal (April – October).

There are a number of opportunities in the urban core

- **Environmental ethic of residents and visitors** – Vermont's culture is rooted in environmental conservation. Bike sharing fits with this ethic.
- **Burlington's young, well-educated population base** – this constituency is the key demographic for bike sharing systems.
- **Popularity of CarShare Vermont's services** – after two years, over 500 drivers are using cars on average between 4-8 hours a day. Users of CarShare will be likely participants in a bike sharing system.

Money aside, the 'plug and play' bike sharing models offered by B-cycle and Bixi offer area stakeholders a fairly straight forward way of introducing bike sharing to the region. Nonetheless, if stakeholders want to seriously consider a bike sharing system beyond the campuses, further study is needed in the following areas:

- An assessment of area residents' interest in utilizing a bike sharing service
- An assessment of municipalities' commitment to creating a safe and seamless network of bicycle facilities
- An assessment of the optimal governmental structure for the venture

- A more complete assessment of the capital and operating budgets and possible funding sources

A UVM class will be delving into some of these questions as part of a class project during the Fall 2011 semester with Professor Lance Polya. We will append their report on to the back of this study once it is completed.

9. NEXT STEPS

Should area community leaders decide that the key findings and the preliminary costs indicate that the bike sharing is worth further exploration, Local Motion suggests that interested municipalities and stakeholders request that the Chittenden County Regional Planning Commission add a full bike sharing scoping project to its future workplan. To guide such a project, a project steering committee should be established with representation from key area institutions, businesses, non-profits and governmental entities.

10. RESOURCES

Bike Sharing Companies:
Sandvault, http://sandvault.com – automated bike share equipment
Collegiate Bicycle Company, http://www.collegebikes.com/aboutus.asp
B-cycle, http://www.bcycle.com/
Public Bike System (Bixi), http://www.bixisystem.com/home
Alta Bicycle Share, http://www.altabicycleshare.com
Metro-Bike, http://www.metrobike.net/
City Ryde Bike Sharing Experts, http://www.cityryde.com
Smoove, http://smoove.fr/
Veolia, http://www.veolia.com/en/
Collegiate Bicycle Company, http://www.collegebikes.com/aboutus.asp
Gravity Cycles, http://www.gravity-cycles.com/
Sobi, http://socialbicycles.com/
Social Bicycles, http://socialbicycles.com/

List of Bike Sharing Systems:
http://en.wikipedia.org/wiki/List_of_bicycle_sharing_systems

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[1] Bicycle Sharing Systems Worldwide:Selected Case Studies, Version 1.1, NiceRyde LLC, 2009, p. 6
[2] Bike-sharing: History, Impacts & Models of Provision, and Future, Paul DeMaio, MetroBike LLC, Journal of Public Transportation, 2009, p. 43
[3] Bike Share – Opportunities in New York City, NYC Department of City Planning, Spring 2009, p. 17
[4] Bike-sharing: History, Impacts & Models of Provision, and Future, Paul DeMaio, MetroBike LLC, Journal of Public Transportation, 2009, p. 42
[5] Bike-sharing: History, Impacts & Models of Provision, and Future, Paul DeMaio, MetroBike LLC, Journal of Public Transportation, 2009, p. 49
[6] Estimate arrived at through conversations with Kevin Grant from Bixi and Lee Jones from B-cycle.