

<b>UTC Project Information</b>	
Project Title	Taming and Tapping the Bike Share Explosion
University	Washington State University
Principal Investigator	Ron Pimentel
PI Contact Information	ron.pimentel@wsu.edu
Funding Source(s) and Amounts Provided (by each agency or organization)	University of Washington PacTrans \$45,000 Washington State University \$45,000
Total Project Cost	\$90,000
Agency ID or Contract Number	69A3551747110
Start and End Dates	September 1, 2018-August 31, 2020
Brief Description of Research Project	This project involves consumer perceptions of Bike Share Systems (BSS). The project is aided by the concurrent work of a civil engineering professor and a law professor at the University of Idaho. Our combined goal is to improve system-wide efficiency for residents and visitors to our region by studying the legal framework, infrastructure needs, and consumer perceptions of BSS. We will identify travel service gaps that BSS can alleviate. We will produce guidance and tools (legal, business, and engineering) that cities, states, and other organizations can use to leverage BSS mobility. The goal of this specific project is to examine consumer perceptions of BSS in order to make adjustments to BSS applications and/or influence consumer attitudes, such that effective usage is increased.
Describe Implementation of Research Outcomes (or why not implemented)  Place Any Photos Here	The research outcomes were recommendations for shared micro-mobility systems. Implementation will depend on municipalities and system operators. The recommendations were shared in poster sessions at the APBP Conference in 2019, the PacTrans   CSET Regional Transportation Conference in 2019, and the TRB Annual Meeting in 2020. Also, a paper, which includes the same information as the final report, has been accepted for publication in the <i>International Journal of Business and Social Science</i> and will be available for searches on the internet.

**If You Provide, Will They Ride? Motivators and Deterrents to Bike Share**  
 Ronald W. Pimentel, Ph.D.<sup>1</sup>, Michael B. Lowry, Ph.D.<sup>2</sup>, David Pimentel, J.D.<sup>3</sup>,  
 Timothy W. Koglin<sup>1</sup>, Amanda K. Glazer<sup>1</sup>, Grace A. Moe<sup>1</sup>, and Marianna M. Kryshik<sup>1</sup>  
<sup>1</sup>Washington State University Vancouver, <sup>2</sup>University of Idaho, <sup>3</sup>University of California Berkeley

**ABSTRACT**

Bike share, a bike share and a scooter system, shared micro-mobility are gaining popularity throughout the United States and internationally, but the optimal system design has not been determined. This study investigated motivations and deterrents to the use of such systems in the Pacific Northwest using a research framework from consumer behavior theory with secondary data, participant observations, depth interviews, and an online survey to users and non-users.

**RESEARCH QUESTION**

What can be done to increase shared micro-mobility adoption in the Pacific Northwest?

**CONSUMER BEHAVIOR CONCEPTS**

Principles from consumer behavior research help to develop an understanding of potential shared micro-mobility users and the market.

**The Product Life Cycle**

All with all goods and services that have market offerings, the evolution of shared micro-mobility programs can be placed within the product life cycle (PLC). There are four stages to the product life cycle: introduction, growth, maturity and decline (Gates, 1982). The introduction stage for bike share systems started in the United States in 2010. Shared micro-mobility systems are currently in the growth stage, which is characterized by many new providers entering the market, but still at different stages of the maturity—different terms of convenience, different forms of ownership, operation, vehicle mix, etc. (see research).

**Theory of Reasoned Action**

The Theory of Reasoned Action is used to predict behavior by measuring behavioral intentions (Fishbein & Ajzen, 1975). Behavioral intentions are a combination of (1) the individual's attitude toward engaging in a behavior and (2) social norms, or how the individual believes that others will view the behavior.

**BI = ABILITY + DESIRE**, where:  
 BI = behavioral intention  
 AB = one's attitude toward performing the behavior  
 DS = one's subjective norm regarding performing the behavior  
 W = empirically derived weights

**FOUR CYCLIST TYPES**

Based on comfort levels regarding different riding situations, a typology of four types of cyclists was developed: **strong and fearless, self-reliant and confident, interested but concerned, and no way no how** (Gates, 2016). The "interested but concerned" group is the largest and is thought to have the greatest potential for micro-mobility.

**METHODS**

An on-line survey was conducted in all zip codes in Washington, Oregon, and Idaho that have shared micro-mobility systems. The survey was developed by the researchers and administered by Qualtrics. Their services provided the respondents according to selection instructions. Qualtrics performed data scrubbing to assure validity of the data that were collected.

**RESULTS—FOUR CYCLIST TYPES**

**Four Types in the Sample**

Geller (2005) determined that 50% of cyclists in Portland were in the "interested but concerned" category. Our sample, which covered most of the Pacific Northwest, included 71% in this category.

We used an index that we derived from the proportion in the group and the behavioral intentions to ride, to determine the potential for new riders in each group.

**New Rider Potential**

Cyclist Type  
 Strong and fearless  
 Self-reliant and confident  
 Interested but concerned  
 No way no how

**RESULTS—MOTIVATORS & DETERRERS**

**Shared Micro-mobility Motivators**

**Motivation**

Exercise and enjoyment were the strongest motivators across ethnicities and genders. Using shared micro-mobility for saving the "lost mile" concern, as a comparison to public transit, was not identified as a strong motivator.

**Shared Micro-mobility Deterrents**

**Deterrent**

Bad weather was the greatest single deterrent. Danger from automobiles was also a significant deterrent, especially for e-scooters. Poor assistance on bikes or scooters helped to alleviate concern about hills, exertion, etc. Carrying things was a concern for scooters.

**RESULTS—THEORY OF REASONED ACTION**

An ordinary least squares (OLS) regression model was fit to the data in order to fit the model of the Theory of Reasoned Action, using weights.

**BI = ABILITY + DESIRE**

	Weight Estimate	Std. Error	P-Value
AB	0.780	0.047	<.001
DS	0.081	0.041	0.05

The weighting for attitude toward the behavior (AB) is very statistically significant, but the weighting for social norms (DS) is not so significant and also tends to zero effect. This indicates that social norms are not a significant predictor of behavior intention and attitude toward the behavior. We repeated the regression for various subsets of the data by gender, age, and ethnicity and found the same result: that our respondents were not self-conscious about using shared micro-mobility.

**DISCUSSION**

There is no quick fix for communities that want to increase usage of shared micro-mobility. Safety is a major concern, especially for scooters. This issue might be addressed by improving infrastructure with more bike lanes and paths, or through education campaigns for the public, safety, and the perception of safety can be enhanced by informing the public of existing laws and promoting confidence that the laws will be enforced. Potential riders are likely to have a distorted view of the risks due to over-representation coverage of the negative news accidents, and that is an educational concern.

An anticipated power assistance on scooters helped to alleviate some deterrents, but increased others such as danger from auto traffic and the difficulty of carrying things compared to bicycles that often include a basket.

Based on the motivations and deterrents identified, usage can be encouraged by having a variety of options available: diverse and distinct, clean and scooters.

Some deterrents cannot be fixed, such as the weather and the hills. Our recommendation is to promote the popular motivation of exercise and enjoyment. Once riders have become accustomed to using and enjoying the shared services in inclement conditions, they are more likely to figure out ways to deal with the weather and the hills.

Any promotional activities should be targeted to the "interested but concerned" segment. If responses are positive, potential for increased adoption. Promotion should emphasize personal benefits to riders as social norms do not seem to be a consideration.

Impacts/Benefits of Implementation (actual, or anticipated)

If municipalities and operators of micro-mobility systems implement the recommendations, the anticipated benefits include improved attitudes toward, and usage of micro-mobility systems. Increased usage could result in reduced automobile traffic, more available parking, fewer auto emissions, and health benefits for riders.

Web Links

- Reports
- Project Website

<https://www.ijbssnet.com/>