

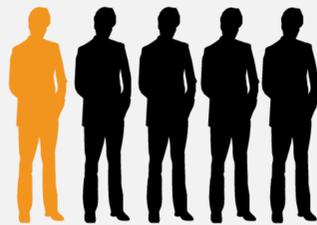


SIMPLECYCLE: ELECTRIFYING BIKE SHARES

CASEY MAUE, TIMBO STILLINGER, SINCLAIR VINCENT

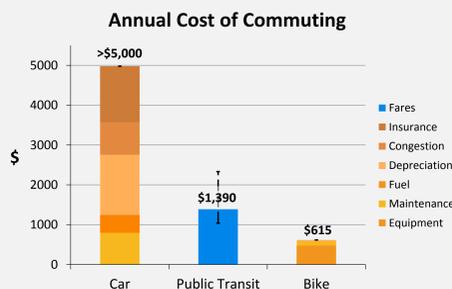
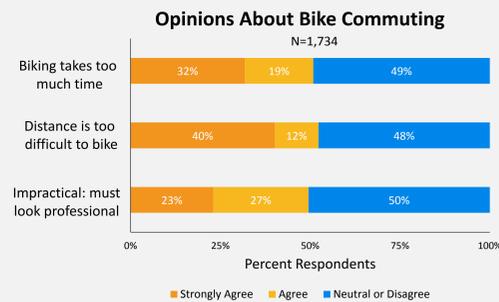


CREATING VALUE FOR URBAN CYCLISTS



1 in 5 commuters want to start bike commuting.

We conducted a survey of nearly 2,000 commuters in order to identify the major barriers to bike commuting. While 20% of respondents indicated biking was their most-preferred means of commuting, many were held back by concerns relating to time and convenience. More than half of respondents felt that biking would take too much time, 40% felt strongly that they lived too far away to bike commute, and 50% agreed that having to look professional at work infringed upon their willingness to bike commute.



Estimate of the annual average cost of bike commuting includes purchase of a new bike. Annual cost of car commuting and public transit made assuming a 12 mi. round trip commute. Public transit fares based on median annual fare in four of SimpleCycle's target markets.

\$4,000
The average car commuter can significantly reduce the annual cost of their commute by switching to biking.

CREATING VALUE FOR BIKE SHARES



Implementing Agencies:

Implementing agencies (typically municipal transportation authorities) implement projects and policies to address public interests such as congestion and air pollution mitigation, equitable access to public transportation, and GHG mitigation. All of these are addressed by augmenting the usage of an existing bike share system. Furthermore, due to their high cost-effectiveness, bike infrastructure projects are increasingly a first-best policy option

Even the most self-sufficient U.S. bike share, Capital Bikeshare in Washington, D.C., only recovers 90 percent of operating expenditures in revenues from fares (ITDP 2013).

Bike share operators:

Across all U.S. bike share systems, user fees ('farebox revenues') are not high enough to cover the costs of operating the system. By creating a more expensive type of service for bike share users, SimpleCycle provides bike share operators with a means of increasing farebox revenues.

WHAT IS A BIKE SHARE?

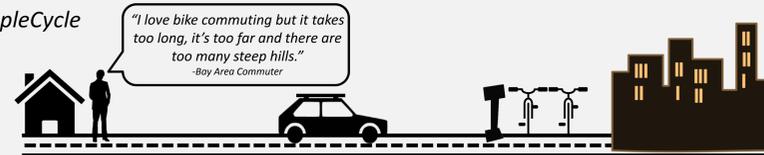
Bike shares are public, non-motorized, transportation services, designed to provide point-to-point bike transportation for short urban trips.



The implementation agency, such as a municipal transportation authority, assumes ultimate control of the system. They oversee the system design, contract out operations, set user fees, and monitor the level of service provided by the system. The bike share operator is a third party who is contracted by the implementation agency to run the daily operations of the bike share.

HOW IT WORKS

Without SimpleCycle

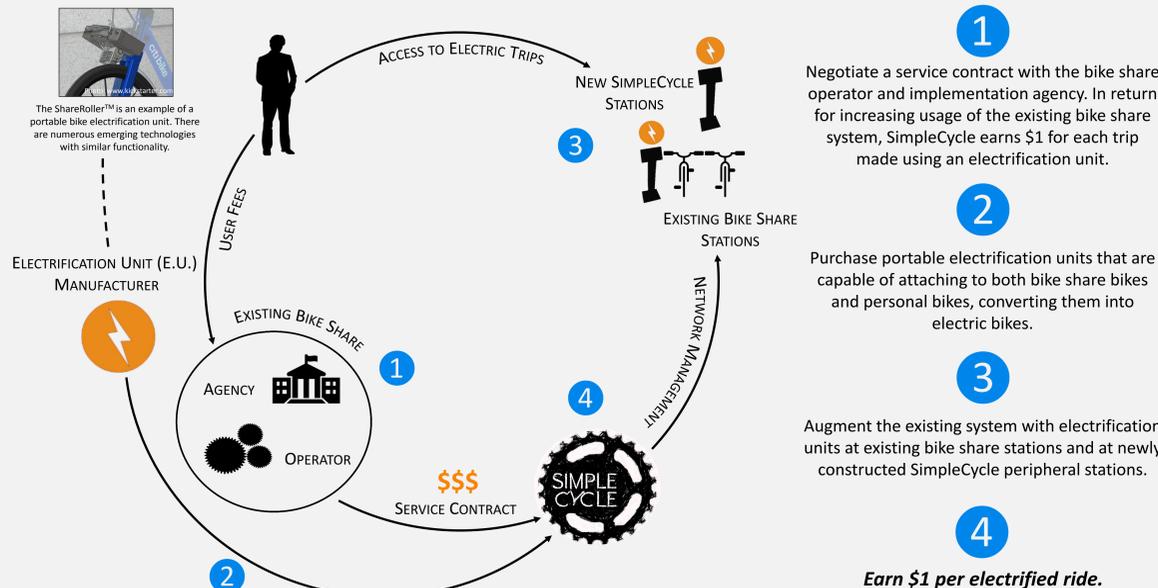


With SimpleCycle



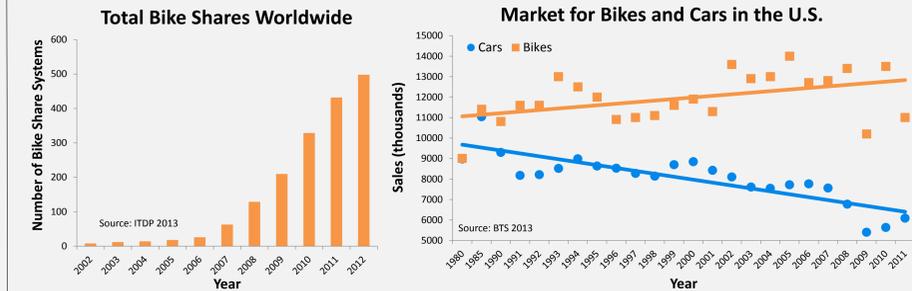
To incorporate electric power into existing bike share systems, new peripheral stations provide cyclists beyond the coverage area of the existing bike share with access to electric power for their personal bikes, and leverage the existing network as pick-up and drop-off locations for the electrification units (EUs). Additionally, the electrification units can be used within the city on bike share bikes.

BUSINESS MODEL



1. Negotiate a service contract with the bike share operator and implementation agency. In return for increasing usage of the existing bike share system, SimpleCycle earns \$1 for each trip made using an electrification unit.
2. Purchase portable electrification units that are capable of attaching to both bike share bikes and personal bikes, converting them into electric bikes.
3. Augment the existing system with electrification units at existing bike share stations and at newly constructed SimpleCycle peripheral stations.
4. **Earn \$1 per electrified ride.**

A TIMELY OPPORTUNITY

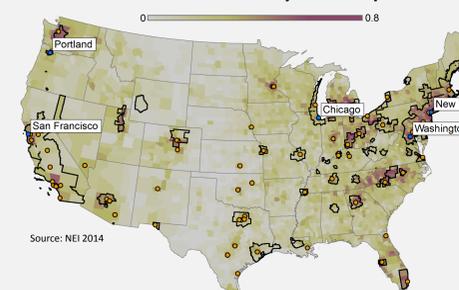


The rapid growth of bike sharing has further reduced the barriers to bicycling in urban areas.

The transition away from the car culture and toward biking correlates with sales trends for bikes versus cars in the U.S.

A SOLUTION TO 'TOO MANY CARS'

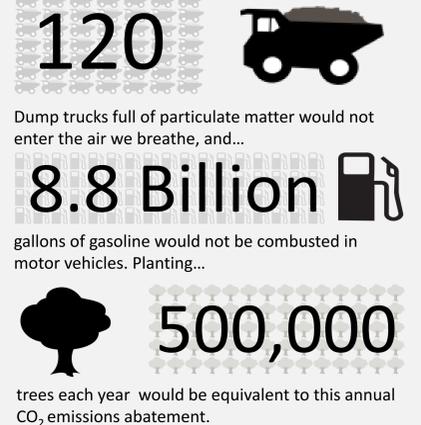
Contribution of Urban Motor Vehicles to Pollutant Emissions and Air Quality Noncompliance



The percent contribution of private motor vehicles to air pollutant emissions in each U.S. county was normalized to 1 based on the maximum observed percent contribution for VOCs, PM_{2.5}, and NO_x. Thus, in the above figure, a value of 1 would indicate a county in which cars contribute the maximum proportion of total VOCs, PM_{2.5}, and NO_x emissions. Black lines indicate the extent of NAAQS non-attainment zones for PM_{2.5}, NO_x, and O₃. The orange dots represent U.S. cities with a population of 250,000 or greater. Blue dots with labels indicate SimpleCycle's priority markets.

In 2012, Americans drove almost 3 trillion miles, enough to travel to the sun and back more than 16,000 times (Perks and Raborn 2012). Cars emit pollutants such as volatile organic compounds (VOCs), nitrogen-oxides (NO_x) and fine particulate matter (PM_{2.5}), which negatively affect human health, and impact ecological systems at broad regional scales. Beyond local and regional issues, the transportation sector accounts for 28% of total U.S. CO₂ emissions, which are a major driver of anthropogenic climate change (EPA 2011a). Finally, the dominance of cars contributes to a dearth of physically active transportation and traffic congestion, both of which impose a high cost on society.

SimpleCycle produces significant environmental benefits by replacing trips in cars with trips on bikes. For example, if every adult in America replaced one daily car trip with a two mile bicycle ride, each year...



By taking cars off the road, SimpleCycle mitigates the effects of motor-vehicle air pollution and contributes to building the social and political inertia for a transition to less fossil-fuel intensive transportation systems.

ACKNOWLEDGEMENTS

We are very grateful for the help from the Class of 2014 Eco-E teams; our Faculty Advisors Emily Cotter and Gary Libecap; Gina Auriemma; The Eco-Entrepreneurship Advisory Council; and the Santa Barbara Social Venture Partners especially Paul Gertman, Mark Levine, and David Kramer.

REFERENCES

Bureau of Transportation Statistics (BTS). (2013). *National Transportation Statistics*. U.S. Department of Transportation, Research and Innovative Technology Administration, Washington D.C. | Institute for Transportation and Development Policy (ITDP). (2013). *The Bike-share Planning Guide*. Institute for Transportation and Development Policy, New York, NY. | National Emissions Inventory (NEI) Data. Office of Air Quality Planning and Standards (OAQPS). 2014. Available: <http://www.epa.gov/ttnchie1/net/2011inventory.html>. Retrieved: February 25, 2014. Perks, R. and Raborn, C. (2013). *Driving and Commuter Choice in America: Expanding Transportation Choices Can Reduce Congestion, Save Money and Cut Pollution*. Issue Paper 13-060A. Natural Resources Defense Council (NRDC), Washington, D.C. | U.S. Environmental Protection Agency (EPA). (2011a). *Inventory of US greenhouse gas emissions and sinks: 1990-2009*. US EPA, Washington, DC.