Hayden Island BikePort

User maintained bike sharing

INTRODUCTION

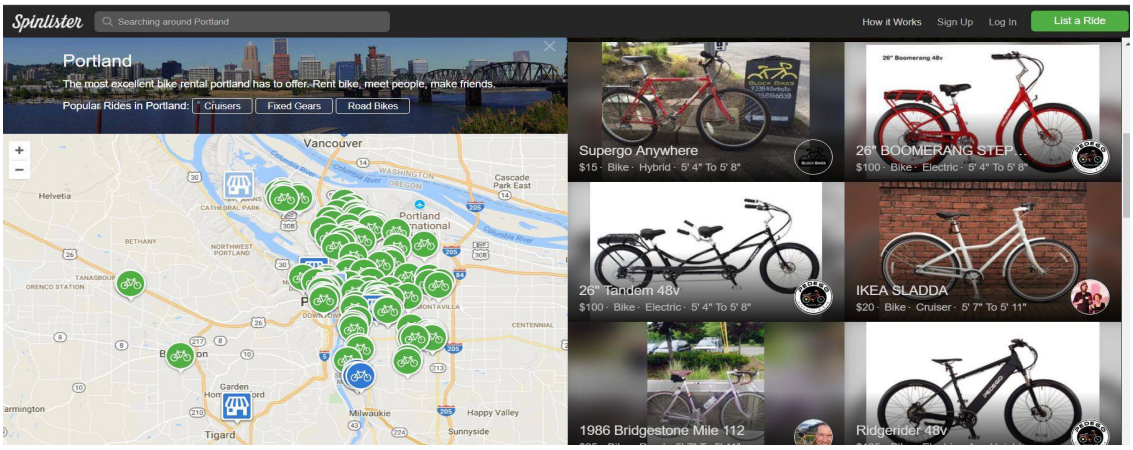
This solar-powered bike hub provides ride-share services on Hayden Island. Indiduals and businesses provide and maintain their own bikes and set their rates. Spinlister provides the bike sharing software, policies and insurance. The non-profit 501(c)3 venture would be self-sustaining through parking fees. The central location is convenient for renters while the solar canopy delivers emergency power after a disaster.

This is a first draft, intended to elicit responses and comments.

NEED

Hayden Island, Portland's only island community, links Oregon and Washington together and brings in 10,000 people daily to the Jantzen Beach Shopping Center. It is not served by Max train. BikePort would provide bikes, used by both visitors and the 2,500 residents, many of whom live on boats, floating homes and manufactured homes.

The interstate bridge, which travels across Hayden Island, is expected to collapse after a subduction earthquake. BikePort would provide emergency power, live cameras, and internet connections when gasoline for electric generators is gone.



It enables individuals from all walks of life earn an income. Currently many residents in the lower income Manufactured Home community (with over 440 units) have no cars. Residents with cars often find congestion on I-5 untenable and move out. Bike sharing allows residents to commute to the Yellow Max line at the Expo Center and reduce congestion, while providing communications and power after an earthquake.

SYSTEM DESCRIPTION

Different elecric bike chargers would be supported by 110 volt AC, while 5 volt usb ports provide phone charging. Power is supplied by solar panels and stored locally on two, 12 volt, 100 a/h AGM batteries while a 1500 watt inverter provides AC output.

Solar panels provides 1.2 kilowatts to BikePort's sealed AGM battery, powering 24/7 live cameras, and free WiFi. Emergency neighborhood power and communications is the main thrust of this proposal. Bike rentals are a way of paying for that capability. The smartphone app tracks user-supplied bikes. A bluetooth u-bolt lock will also be supplied so anyone can secure their own rental bike in the rack and enable unlocking by renters.

BikePort provides permanent outdoor signage with QR codes linking to the Spinlister website. That's where renters and rentees transact business. The free WiFi can also take you to the charge station website. Posters on the side of BikePort explain operation. A Kiosk enables people to view advertising or instructions**.**

LOCATION

At least three sites are proposed in this draft proposal. (1) the ODOT parking lot at the base of the Interstate Bridge, (2) at the Jantzen Beach Mall on an unused lot, or (3) across from the Safeway parking lot overlooking North Portland Harbor by the MenJiro restaurant.

That property may be ideal since it is near the bike bridge path, already has shore power and cable/communications junction boxes, and a steel canopy that could easily support several thousand watts of solar along with grid tie-ins.

ELECTRIC BIKE

Entrepreneurs would supply and maintain their own bikes. Each person can set their own rates. Bikes would be tracked by their phones and lock combinations could be sent to unlock the phone from the bike hub. Electric bikes make riding to the Yellow line Max train at the Expo Center easy. A BikePort at Expo Center would expedite movement.

Individuals may supply their own bikes for rent (manual or electric) and all transactions would be provided through the Spinlister app. Current businesses that rent ebikes include; The eBike Store (809 N Rosa Parks Way), Pedego Electric Bikes (412 SW 2nd Ave), Cynergy E-Bikes (3838 SE Powell) and Bike Gallery (1001 SW 10th)

Bike demand may moderate in the winter, but congestion is a constant problem, so the benefit of getting to the Yellow Max Line at the Expo Center will be a constant.

In addition, a 160 room Marriott, Hotel Indigo and Hyatt Place will start construction soon, bringing 400 new hotel rooms within walking distance from Hayden Island. Waterfront Vancouver is a major $1.5 billion development, opening next year.

COMMUNICATIONS

BikePort's main goal is to provide improved mobility for island residents, but an important secondary goal is to provide electricity and communications in the event of a disaster. Bike sharing provides a funding mechanism for this facility.

In the event of a subduction zone earthquake, it's expected that the island's substation would loose power if the island's transmission towers, on West Hayden Island, topple due to liquification. Without a source of power, the island could go dark.

Gas for powering generators is also expected to be in short supply. Some 75% of Portland's fuel comes in by pipeline with the other 25% by ship.

Portland's Critical Energy Infrastructure near Linnton, may be non-operational for some time after an earthquake, restricting gas for generators. Solar power, stored in batteries, could provide limited power and communications. The 1.2 Kilowatts of solar panels would feed two, 12 volt, 100 amp/hr batteries (equivalent to 2400 watt/hrs of capacity). The panels are expected to fully charge the batteries in 3-4 hours of sun. If our power budget is 100 watts for lights, communications, and cameras, then a 2,400 watt/hr battery might operate a 100 watt load for 24 hours.

This estimation is for illustration purposes only, and does not reflect real world requirements or power losses. It's used as a general guide. Professional consultation would provide specific recommendations for solar and battery capacity.

Our tentative power draw:

1. Indoor/Outdoor Wireless Security Camera (10 watts)

https://arlo.com/en-us

2. Chrome OS Managed Kiosk (10 watts)

https://youtu.be/62wo27eeg8w

3. Netgear Nighthawk M1 hotspot supports Gigabit LTE (15 watts)

http://www.netgear.com.au/landings/nighthawk-mr1100-mobile-router/

4. Comcast cable modem (15 watts)

5. (Optional) Jupiter 2 HughesNet satellite internet (50 watts)

http://internet.hughesnet.com/gen5.html

Why a satellite terminal? Satellite may provide the only reliable connection after an earthquake. Broadband internet will be invaluable (for things like drone photography), and the HughesNet Jupiter2 service is more than half the cost of cellular data plans.

HughesNet Gen 5 Mobile Satellite Deployment

Satellite internet would save us more than $50/month over cellular data and works when cellular is down, although it IS more expensive than cable or landline data.

Our total power draw is estimated at 50 watts (without the satellite terminal) or 100 watts (with the satellite terminal). Therefore, a 50 watt total load powered by a 2400 watt/hr battery (12 volts x 200 ahs), should run 48 hours before the battery is totally depleted. The 100 watt load would run 24 hours.

A 50 watt (communicatins) load for 18 hours would be 900 watt hours and the bike charging load (or satellite) may average another 900 watt/hrs per day, totaling about 1800 watt/hours. The 2400 watt/hr battery capacity could charge two electric bikes, even with 500 watt/hr batteries, while operating all comunications functions. The solar and battery capacity should provide reliable power for running the system for 18 hrs/day and supply emergency power and communications (via satellite) after a disaster.

MANAGEMENT

BikePort lets bike owners use applications like Spinlister.com to make money and offer bike sharing. Consequently, management is simplified greatly.

The main responsibility of the BikePort manager is space rent. The space manager must generate enough space rent to maintain reliable operation of the solar canopy. BikePort operates as a 501(c)3, perhaps under the umbrella of the Hayden Island Neighborhood Association or other organization.

REVENUE

The goal is self-sustaining operation. If we target an income of $150-$250/month, with space for 6 bikes, then that generates about $1800/year. Additional revenue could be generated by advertising on a Kiosk, perhaps $75/month.

If bike parking at BikePort costs $25/mo per bike (x3) for a manual bike and $35/mo (x3) for an electric bike, that generates ($75+105/mo) or $180/month, enough to pay a stipend for the space manager. The bike providers are responsible for all their bike rental operation, including all maintenance and security.

Bike sharing demand is strong. BikeTownPdx has averaged .93 trips per bike per day in year one. Revenue at $10/day x 15 days would be $150/mo (per bike). So there appears to be a compelling incentive to pay a $25/month space rent.

Hayden Island is not in Nike's Bike Town service area. Bike Town, for all its stengths, does not enable bike owners to rent them out, or provide the local business stimulus.

FUNDING
Pacific Power is offering funds for clean energy projects that serve communities. The funding comes from the utility's Blue Sky program, which has provided $10 million for clean energy projects since 2006. PGE's energy programs and Bonneville renewable programs also offer funding for a variety of community solar projects.

Bike rental shops would benefit from remote locations and may be a sponsor as would destinations on the Jantzen Beach Mall, restaurants, or the Vancouver Waterfront.

SUMMARY
This draft proposal for a solar-powered bike rental station on Hayden Island would benefit residents and visitors as well as owners of bikes that want to earn a little extra money by renting them out in a convenient, safe and secure, centralized location.

The goal of this 501(c)3 operation is to reduce congestion, provide efficent transportation services and emergency backup power with internet service in the event of an earthquake.

It delivers a simplified, economical approach to management because bike owners must take responsibility for their own operation and maintenance. It enables all members of society to benefit for efficent shared transportation infrastructure.

(pdf link to this paper)
http://www.hayden-island.com/wp-content/uploads/2015/10/Hayden_Island_bike_port.pdf

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http://www.hayden-island.com
http://www.hayden-island.net
http://www.hayden-island.com/biking/
http://www.hayden-island.com/free-wifi/
http://www.hayden-island.com/self-driving-car-proposal/
https://portlandgreenenergy.wordpress.com/

LINKS AND RESOURCES:

BIKE SHARING SERVICES

https://www.spinlister.com
https://ebikestore.com/
http://www.pedegoelectricbikes.com/dealers/portland/
http://www.cynergyebikes.com/
http://www.bikegallery.com/about/rentals-pg80.htm

COMMUNICATIONS

1. GPS "Smart Lock"
https://www.lattis.io/products/ellipse
2. Indoor/Outdoor Wireless Security Camera
https://arlo.com/en-us
3. Jupiter 2 HughesNet satellite internet
http://internet.hughesnet.com/gen5.html
4. Google WiFi Hotspot
https://madeby.google.com/wifi/
5. Chrome OS Managed Kiosk
https://youtu.be/62wo27eeg8w

POTENTIAL PARTNERS:

CITY OF PORTLAND

1. Portland Bureau of Transportation
https://www.portlandoregon.gov/transportation/
2. Portland Bureau of Planning and Sustainability
https://www.portlandoregon.gov/bps/
3. Portland Bureau of Emergency Management
https://www.portlandoregon.gov/pbem/

CITY/STATE AGENCIES

1. TriMet
https://trimet.org/sustainability/
2. Metro
http://www.oregonmetro.gov/
3. Port of Portland
http://www2.portofportland.com/
4. Oregon Dept of Transportation
http://www.oregon.gov/ODOT/pages/index.aspx
5. Oregon Department of Energy
http://www.oregon.gov/energy/at-work/pages/energy-incentive-programs.aspx
6. US Dept of Energy
https://energy.gov/savings/business-energy-investment-tax-credit-itc

UTILITIES

1. Portland General Electric
http://www.pgefoundation.org/
2. Pacific Power
https://www.pacificpower.net/env/bsre.html

FUNDING
1. Portland General Electric
http://www.pgefoundation.org/
2. Pacific Power
http://www.b-e-f.org/
3. Energy Trust of Oregon
https://www.energytrust.org/
4. Forth Mobility (Drive Oregon)
https://forthmobility.org/
5. Prosper Portland (PDC)
http://prosperportland.us/
6. Murdock Foundation
http://murdocktrust.org/
7. Meyer Memorial Trust
https://mmt.org/

INDUSTRY ORGS
1. Solar Oregon
http://solaroregon.org/resources/
2. Oregon Solar Energy Industries Association
http://www.oseia.org/
3. Oregon Electric Vehicle Association
http://oeva.org/
4. IBEW Local 48
https://www.ibew48.com/

BUSINESSES
1. Cynergy E-Bikes
http://www.cynergyebikes.com/
2. E Ebike Store
https://ebikestore.com/
3. Genze Electric Bikes
http://www.genze.com/
4. Solar World
https://www.solarworld-usa.com/
95 Sanyo US
http://www.us.sanyo.com/Business-Units

POTENTIAL PARTNERS
1. McCuddy's Hayden Island Moorage
http://mccuddysmarina.com/hayden-island-moorage/
2. Columbia Crossing
http://columbiacrossings.com/marinas/tomahawk-bay/
3. Alder Creek boat rental
https://aldercreek.com/
4. Oxford Suites
http://www.oxfordsuitesportland.com/
5. Red Lion Hotel
https://www.redlion.com/jantzen-beach
6. Holiday Inn Express
https://www.ihg.com/holidayinnexpress/hotels/us/