Cycle Pack:

Operational Manual

By Cole Laush

Mission

Cycle Pack is a bicycle library program that encourages bicycle ridership by providing long term bicycle rentals to UW students. Unlike bike share, which provide short term bicycle rentals between two hubs, and regular bike rentals, which facilitate daily or weekend use, a long term rental gives users an experience of bicycle ownership. The experience of ownership teaches users about the various ways a bicycle can fit into one's everyday life as well as the responsibility that stems from maintaining and preventing bicycle theft. It is our view that providing an experience of bicycle ownership is the best way to demonstrate the value of a bicycle to a user and foster a desire to purchase a bicycle after completing the program. It is our goal to do more than just increase bicycle ridership on and to campus. We hope that providing this service will encourage sustainable cycling habits that persist into the rest of a user's life.

Vision

To become a heavily utilized and sought after program on campus. Keeping the supply smaller than the demand in order to ensure intentional applicants are admitted to the program. Using survey responses as indicators for success and shortcomings, the program will be adapted to fit students needs. As the program gains popularity so will the involvement from the existing program collaborators and new funding routes will be identified in order to improve and sustain the program. Advertisement space on the bicycle and Cycle Pack promotional materials will be used to mutually benefit the contributing companies/departments.

Values

Sustainability, Collaboration, Intentionality, Flexibility, and Innovation

Target Audience

University of Washington Students who would consider cycling if they had access to one, and could benefit from using a bicycle to commute to campus. We have determined that students who live beyond reasonable walking distance from campus (reasonable walking distance < 0.75 miles) and within a reasonable cycling distance from campus (reasonable cycling distance < 4.0 miles) are those who could benefit most from our program.

Roles

UWild

- Provides storage for the Cycle Pack fleet
- Maintains, and repairs bicycles between rental periods
- Facilitates rental transactions and bicycle orientation

- Reviews applications and determines successful applicants
- Advertisement of Cycle Pack on their digital platforms
- Representatives attend the quarterly Cycle Pack meeting

EcoReps
- Generates informational and advertising materials for Cycle Pack
    - Cycle Pack Outreach and Marketing Coordinator
- Curation of Cycle Pack survey and application metrics
- Markets Cycle Pack through tabling events and postering
- Advertisement of Cycle Pack on their digital platforms
- Representatives attend the quarterly Cycle Pack meeting

UW Sustainability
- Facilitates quarterly Cycle Pack meeting between; UWild, CSF, UW Transportation and EcoReps
- Advertisement of Cycle Pack on their digital platforms
- Representatives attend the quarterly Cycle Pack meeting

CSF
- Advertisement of Cycle Pack on their digital platforms
- Representatives attend the quarterly Cycle Pack meeting

UW Transportation Service
- Representatives attends the quarterly Cycle Pack meeting

Cycle Pack Meetings

Every quarter, a Cycle Pack meeting is held to discus;

- Survey responses from the previous quarter
    - Survey responses should ideally be used to justify potential changes to this document
- Application metrics
    - The Application metrics will uncover who is taking advantage of the program, and what strategies have been effective. This information will also reveal if there is a need to purchase bicycles of a certain size
- An advertising strategy for the upcoming quarter
- Potential issues/problems with the program
- Goals for the upcoming quarter
- In the Fall of 2020, and Winter of 2021 after the program has been running for three years, the conversation will also include how to expand the program

- In the Spring of 2021 a plan for implementation of an expansion strategy will be determined
- Starting in the Fall of 2021 the implementation strategy will be discussed and amended if necessary

These meetings are facilitated by Sustainability Specialist Sean Schmidt, in the third week of every quarter. This meeting will consist of; UW Sustainability representative(s), UWild representative(s), CSF representative(s), EcoReps representative(s) including the Cycle Pack Marketing and Outreach Coordinator, and UW Transportation Services Representative(s). Highlighted members of this meeting include UWild's Assistant Director, Matt Jensen, and UW Transportation Services' Active Transportation Specialist, Ted Sweeney.

Cycle Pack Meeting Facilitation Plan

Regular Meetings

- Open the floor to Matt Jensen to discuss failures and success of the program in the previous quarter (5-10 min)
- Discuss solutions to potential problems (5-15 min)
- Vote upon a solutions to the problems (5 min)
- Review survey and application metrics assembled by the Cycle Pack Outreach and Marketing Coordinator (5-10 min)
- Discuss the metrics and consult with the Cycle Pack Marketing and Outreach Coordinator on a marketing strategy for the upcoming quarter (10 - 15min)
- Vote upon marketing strategy for the upcoming quarter (5 min)
- Open the floor to any amendments to the original Cycle Pack program plan (5-10 min)
- Vote upon any amendments (5 min)

Include in Fall quarter meeting, 2020, and Winter quarter meeting, 2021

- Discuss strategy for expansion of the program (5-10 min)

Include in Spring quarter meeting, 2021

- Discuss a strategy for expansion (5-15 min)
- Vote on strategy (5 min)

Include starting Fall of 2021

- Discuss implementation of expansion strategy and decide on amendments to the strategy (5-15 min)
- Vote on amendments (5min)

*Votes will be decided by majority rule with the exception of a veto from the Assistant Director of UWild, Matt Jensen. Matt can chose to stand aside on vote he doesn't agree with but has the power to veto the vote if he believes it is in the best interest of the program.

Marketing & Outreach

Each quarter, EcoReps will generate graphics and advertising materials for Cycle Pack. EcoReps have the option to either allocate this task to one of their quarterly service learners or offer the role to an interested volunteer with the organization. The position will be referred to as the, “Cycle Pack Marketing and Outreach Coordinator.” The duties of this position will include; attending the quarterly Cycle Pack meeting, postering for the opening and closing of the Cycle Pack application, generating posts for Cycle Pack partnering organizations to post to their digital platforms, managing the Cycle Pack facebook page, maintaining and reviewing metrics from applications and survey data, and developing innovative marketing strategies.

During the third week of each quarter, the Cycle Pack quarterly meeting will be held. At this meeting the Cycle Pack Marketing and Outreach Coordinator will suggest marketing strategies and be debriefed about what marketing strategies have worked in the past. By the end of the meeting there should be an agreed upon strategy for how to move forward with the marketing strategy for the upcoming quarter.

In addition to any innovative marketing strategies that are developed at the quarterly meeting, there should be at least two regular posts per quarter; The first post should go out in the third week of the quarter corresponding with the opening of the Cycle Pack application, and the second post should go out a week before the application closes. The application will formally close as the at 11:59pm on the Friday before finals week.

Suggested innovative marketing and outreach ideas

- Interviews with users who are renting or have rented a bicycle
- Video of the rental and return process
- Video of cafe cycling tips around campus
- Promotional video of Cycle Pack users commuting to campus/ going on group rides ect.
- Creating a partnership with the UW Bike Shop / UW Cycling RSOs

User Liability

There are several risks, physical and financial, associated with the use of a Cycle Pack Bicycle. These risks and penalties are;

- In the event of loss/theft/damage to the bicycle, users will be required to pay a fee for replacement of the bike and its accessories, or in the case of damages; the cost of repair/replacement.
    - Even if a bike is securely locked, there is still an inherent risk in the location the bike is being locked. Being vigilant of where a bike is locked and the duration of its stay is part of bike ownership.
    - Regular maintenance and repair of old components is paid for by the program. If a component breaks, the cost will fall on the user if the damage is intentional or a result of negligence. In order to aid in this determination, each component is

checked between rental periods, the miles on the component are logged, and pictures are taken of the bike before the bicycle is handed over to the renter.

- If a user loses the key to their bicycle lock, Cycle Pack will unlock the bicycle replace the lock with a new one, and charge the user for the cost of a new bicycle lock
    - This prevents the threat of users claiming to have lost keys and then using the key in the future on cycle pack locks in an attempt to steal a bicycle.
    - The costs of requesting new keys or the potential labor cost of having to physically break a lock because a user loses the spare key given to them are additional incentives for this strategy.
- If accessories on a bike are lost/stolen or significantly damaged the user is responsible for paying for the replacement of the accessory.
    - This does not include dead batteries
- If a user is hurt in any way, hurts someone else, or causes any damage while using one of the program bicycles, the physical liability is on the user. This includes if the user allows someone else to use their bicycle.
    - The bikes are checked before they are distributed to ensure that all the components are fully functional and safe.
    - The bike is not meant to be used by anyone but the renter

Application (Link)

The application for Cycle Pack opens in the third week of every quarter. The official opening of the application should correspond with the marketing strategy determined in the Cycle Pack meeting that takes place during the same week. The application will remain open until 11:59pm on the Friday before finals week.

The application consists of several multiple choice/short answer questions and two 150-300 word essays:

- First Name
    - Collected in order to inform users their application has been received/accepted/rejected
- Last Name
    - Collected in order to inform users their application has been received/accepted/rejected
- Email
    - Collected in order to inform users their application has been received/accepted/rejected
- Will you be a student at the University of Washington next quarter? (A valid UW ID will need to be provided upon checkout a bike in order to receive a bicycle)
    - This program is only offered to UW students who will be enrolled in classes during the duration of their rental.
- What address will you be living at next quarter?

    - Preference is given to student who live beyond walking distance from campus (greater than .75 miles) and within bike distance of campus (less than 4 miles).
- Height
    - Using height, bike size can be determined. Cycle Pack has 3 bicycle sizes, Small (46 cm), Medium (53 cm), and Large (58cm). Applicants must be provided a bicycle within the recommended bicycle size for a user. If the supply of bikes of a certain size are outweighed by the demand for them, then those applicants will need to be compared.

Height (Inches)[1]	Dew Bike Sizes (cm)
4'10" - 5'1	**46**/48
5'0" - 5'3"	**46**/48/49
5'2" - 5'7"	48/49/52/**53**/54
5'6" - 5'11"	52/**53**/54/55/56
5'10" - 6'3"	54/55/56/57/**58**/59/61
6'2" - 6'5"	57/**58**/59/61

- How did you hear about Cycle Pack?
    - This information will be used in order to target our advertising efforts.
- Why do you want to rent a bicycle through Cycle Pack? (150-300 words)
    - This question will help in determining why an applicant wants to use the program.
- What trips do you plan on making by bike? (150-300 words)
    - This question will help in determining how an applicant will use their bicycle.

Application Review

The Applications will be reviewed by the Assistant Director of UWild, Matt Jensen. Applicants who have been accepted into Cycle Pack will receive an acceptance email with the rental agreement document, liability waiver, and any promotional material generated for the program. For example bike safety/maintenance literature, or an invitation to join the Cycle Pack Facebook group. Accepted applicants will also be prompted to sign up for for a checkout/orientation time slot.

In reviewing the applications, Matt will make his decision based on;

- If the applicant will be enrolled in classes at the UW
    - Yes - Pass
    - No - Fail

[1] "Dew Plus." KONA BIKES. Accessed April 17, 2017. http://www.konaworld.com/dew_plus.cfm.

- Has the student used the program before (names will be cross referenced with students who have already used the program). It is our goal to have new applicants and not to create dependent users
    - Yes - unpreferred
    - No - prefered
- Address of student
    - Closer than .75 miles from the Husky Union Building - unpreferred
    - Between .75 miles and 4 miles from the Husky Union Building - preferred
    - Farther than 4 miles from the Husky Union Building - unpreferred
- Height
    - There are only 6 small (46 cm), 8 medium (52 cm), and 6 large (58 cm) bicycles in the initial Cycle Pack fleet. Users applying to the program are split into three application pools based upon their height and corresponding bike size.
- Essay questions
    - These questions help determine who the applicants are and their motives for using the program
    - Grammar will not be weighted in an application decision

Checkout/Orientation

Upon checkout, a user must bring a Husky ID and a credit/debit card which will be entered into the system in case of damages/loss/stolen equipment. During this transaction users will be charged a $50 sustainability fee and required to either purchase a helmet through UWild for $25 or present their own personal helmet. By Seattle law, it is illegal to ride in the city without a helmet so it is crucial to ensure students have the proper safety equipment before being able to checkout a bicycle. If a student refuses to purchase a helmet or bring their own, they will not be able to leave with a bicycle.

Before a user is allowed to ride away on their bike, they must attend a short orientation facilitated by UWild. During the orientation, students will be informed about cycling safety, user responsibility, bike maintenance, and the cool programs offered to cyclists at the University of Washington. After completion of the checkout and orientation process, students will be able to ride away on their bicycles.

Check In

Students must return their bike to the UWild facility on or before the Friday of Finals week. An email will go out to all program users informing them of the turn in procedures, and chunks of time that UWild will be available to check in the bikes. The check in procedure consists of; having a UWild representative look over the bicycle to assess if there are any significant damages, recording general wear and tear on the bike, photographing the bicycle, collection of the bike lock/key,

checking to see if the students received the survey email, and reminding them to fill it out when they get an opportunity.

Survey (Link)

After a user completes the Cycle Pack program, they are sent a survey about their experience. The purpose of this survey is to see if the program is effective and to pinpoint areas that can be improved in the future. The questions in this survey include;

- Were you able to use your bike to commute to class?
- On average, how many trips did you make by bike per week? (A trip is from one destination to another, so to school and back would be 2 trips)
- After completing the program, are you more likely to own a bike in the future?
- What did you enjoy about your experience with Cycle Pack?
- What could we do to improve your experience using Cycle Pack?

The responses to these questions will be collected and shared at the quarterly meeting facilitated by UW Sustainability. The answers to these question will be used to help shape the program as it changes over time. These questions will also need to be shaped over time in order to examine more specific problems and to make sure the survey is relevant.

Components

Bicycle

The Bicycle that has been selected for Cycle Pack's fleet is the Kona Dew Plus. Kona is a pacific northwest company with their world headquarters based out of Ferndale Washington. In the search for a bicycle I made sure to limit my search to local companies in order to promote our local economy and to cut down on pollution generated by shipping. UWild also already has a contract with Kona for Wild's existing short-term bicycle rental fleet. This contract allows us to purchase bicycles at wholesale rates which takes hundreds off the price tag for a bicycle.

[2]				
Name	Dr Dew	Dew Deluxe	Dew Plus	Dew
Whole Sale Price	659	560	463	324
Frame Material	Kona 6061 Aluminum Butted	Kona 6061 Aluminum Butted	Kona 6061 Aluminum Butted	Kona 6061 Aluminum Butted
Sizes	46, 48, 52, 55, 57, 59	46, 48, 52, 55, 57, 59	46, 48, 52, 55, 57, 59	46, 48, 52, 55, 57, 59
Rear Shock	n/a	n/a	n/a	n/a
Fork	Kona Project Two Aluminum Disc	Kona Project Two Aluminum Disc	Kona Project Two Aluminum Disc	Kona Project Two
Crankarms	SRAM NX	Shimano Alivio	Shimano Acera	Shimano Altus
Chainrings	40t X-Sync	26/36/48t	26/36/48t	28/38/48t
B/B	SRAM GXP	Shimano	Shimano	Shimano
Pedals	Wellgo Platform	Wellgo Platform	Wellgo Platform	Wellgo Platform
Chain	SRAM PC1110	KMC X9	KMC X9	KMC Z72
Freewheel	SRAM NX 11-42t 11spd	Shimano Alivio 11-34t 9spd	Shimano Acera 11-34t 9spd	Shimano Tourney 12-32t 8spd
Chainguide	n/a	n/a	n/a	n/a
F/D	n/a	Shimano Acera	Shimano Altus	Shimano Tourney
R/D	SRAM NX	Shimano Alivio	Shimano Acera	Shimano Altus
Shifters	SRAM NX	Shimano Acera	Shimano Acera	Shimano Tourney
Brake Calipers	Shimano Acera	Shimano Acera	Tektro HDM285	ProMax V-Brake
Front Brake Rotor	Shimano Acera 160mm	Shimano Deore 160mm	Tektro HDM285 160mm	n/a
Rear Brake Rotor	Shimano Acera 160mm	Shimano Deore 160mm	Tektro HDM285 160mm	n/a
Brake Levers	Shimano Acera	Shimano Acera	Tektro HDM285	Shimano Tourney
Headset	FSA No.10P	FSA No.10P	FSA No.10P	CH281
Handlebar	Kona Aluminum Riser	Kona Aluminum Riser	Kona Aluminum Riser	Kona Aluminum Riser
Stem	Kona Commuter	Kona Commuter	Kona Control	Kona Control
Seatpost	Kona Thumb w/Offset 27.2mm	Kona Thumb w/Offset 27.2mm	Kona Thumb	Kona Commuter
Seat Clamp	Kona Clamp	Kona Clamp	Kona Clamp	Kona Clamp
Grips	Kona Race Light	Velo Ergo	Kona Commuter 27.2mm	Kona Commuter 27.2mm

[2]Kona, 1.

Saddle	Kona Commuter	Kona Commuter	Kona Comfort	Kona Comfort
Front Hub	Shimano 100x9mm	Joytech 100x9mm	Joytech 100x9mm	Formula 100x9mm
Rear Hub	Shimano 135x10mnm	Joytech 135x10mm	Joytech 135x10mm	Formula 135x10mm
Spokes	Stainless Black 15g fr / 14g rr	Stainless Black 15g fr / 14g rr	Stainless Black 15g fr /14g rr	Stainless 15g fr /14g rr
Rims	WTB SX17	Double wall alloy	Double wall alloy	Shinning MT20
Front Tire	Clement X'Plor MSO 700x40c	Schwalbe Delta Cruiser 700x35c	Schwalbe Delta Cruiser 700x35c	Kenda K935 700x35c
Rear Tire	Clement X'Plor MSO 700x40c	Schwalbe Delta Cruiser 700x35c	Schwalbe Delta Cruiser 700x35c	Kenda K935 700x35c
Paint Color	Matt Orange/Black	Matt Green/ Green	Matt Gray/Black or Matt Blue/Black	Matt Charcoal/Gray or Matt Black/Gray
Extras	Fenders & Kona Bell	Kona Bell	Kona Bell	Kona Bell

After researching the bicycle options offer by Kona, I found that the Dew series offers the most affordable commuter bicycle. From the four bicycles offered in the Dew series, I chose the Dew Plus. I made this determination for two reasons; First, because Seattle is often subject to wet riding conditions, I wanted to include disc brakes in the bicycle package. Disc brakes vastly outperform V-Style rim brakes in wet conditions making the bicycles much safer for Cycle Pack users. This consideration eliminated the Dew standard bike from the lineup, although it came at a cost of $100 over the standard Dew. Second, the components offered through the three remaining bicycles were very similar so I weighted cost heavily in the selection between the three remaining options; the Dr Dew offers fenders and an 11 speed freewheel. While these would be an improvement over the 9 speed option on the other two bikes and save us from purchasing fenders, the $200 cost difference between the Dr Dew and Dew Plus made this a pricy option. Especially since Fenders only cost around $50 which means you'd be paying an extra $150 for 2 additional speeds. Next I compared the Dew Deluxe and Dew Plus. both of the bikes offer an extremely similar component package. From what I could determine the Dew Deluxe offers slightly improved brakes at a cost of $100. After weighing these two options, I determined that the benefit of slightly improved brakes doesn't outweigh the $100 price tag.

Fenders

Fenders are an essential element on a bicycle, not only do they keep the user dry and comfortable in wet conditions, but they prevent the rusting of bicycle components like the chain and the cassette. There are a couple of different types of fender; full length, partial fenders, and snap on fenders. From my research, full length fenders are the only ones that are really effective at actually keeping the user dry. With this search criteria in mind i looked into what was on the market for full length fenders and found that planet bike fenders were highly recommended, I also looked into some soma fenders that looked promising. Of the fenders I looked at the Planet Bike Hardcore fenders stood out as high quality fenders made from durable materials at a reasonable price.

Name	Material	Price	Link
Cascadia ALX 700 Medium	Aluminum	65	Link
Cascadia Hybrid - Black	Poly	55	Link
Cascadia Hybrid - Silver	Poly	55	Link

Planet Bike Hardcore	Poly	38	Link
SOMA RAIN DOG FENDER SET	Pastic	45	Link

Locks

There are a variety of different bicycle locks on the market ranging from cain locks, to electronic locks that link to your cell phone. Initially I was very intrigued by the ELocks as they would prevent the needs for keys and they would give users a digital connection to their bicycles. However, the high cost that came with the ELocks features made this option inadvisable for the purposes of this program. I also considered chain/cable locks but upon reading about the safety issue of using chain/cable locks in densely populated areas made left me with only one other option, the U-Lock. U-Locks generally come in two different forms, combination and key locks. After reading some reviews for combination U-Locks and discussing the matter with Matt Jensen, it became clear that combination locks suffer much more severely in the weather than key locks and combination locks also pose a threat to theft from people who have used the program in the past. Landing on standard key U-Locks I proceeded to look at two different Kryptonite U-Locks. I personally own the 4x9 inch model and have been impressed by the durability and the size. I think that going with anything with smaller than a 4 inch gap would make properly locking up a bike on campus challenging. Therefore I selected the the 4 x 9 inch model for this program.

Name	Cost	Smart	Type	Combo	Key	Solar	Battery Life (Months)	Optional Fob	Alarm	Geo Tagging	W/Cable	Link
BitLock	129	yes	ULock	yes	no	no	60	no	no	Yes	no	Link
Linka	129	yes	Frame	yes	no	no	9	no	yes	yes	no	Link
Noke U-Lock	129	yes	ULock	yes	no	no	60	$25	yes	yes	no	Link
Lattis ellipse	199	yes	ULock	yes	no	yes	solar	no	no	yes	no	Link
Amazer Bike Lock	20	no	ULock	yes	no	no	no	no	no	no	no	Link
Kryptonite New York U-Lock	72	no	ULock	no	yes	no	no	no	no	no	no	Link
Kryptonite Kryptolok Series 2	32	no	ULock	no	yes	no	no	no	no	no	yes	Link
TiGr mini Lightweight Titanium Bicycle Lock	99	no	ULock	no	yes	no	no	no	no	no	no	Link
Missm Bike Anti Theft Lock Chain	29	no	Folding Lock	no	yes	no	no	no	no	no	no	Link
Kryptonite Kryptolok Series 2 Mini-7 U-Lock: 3.25 x 7 in.	38.95	no	ULock	no	yes	no	no	no	no	no	no	Link
Kryptonite Kryptolok Series 2 STD U-Lock With Bracket: 4 X 9 IN	40.95	no	ULock	no	yes	no	no	no	no	no	no	Link

Lights

Lights are an essential safety item in the evening for seeing where one is going and alerting other bikers and driver of one's presence on the road. Bike lights are also required by law after dusk. A rider needs to have both a front and back light to be considered legal. There are two

main types of bike lights, rechargeable and battery powered. For the purpose of this program I wanted to use rechargeable batteries to ensure a long life span of the lights and to prevent the waste created by disposable batteries. The other variable to consider when choosing lights are the lumens put out by a bike lights. I ended up choosing the Blaz 180 SL set because it comes with both a front and back light, both of which pump out a considerable amount of lumens.

Name	Brand	Cost	Battery	Front Lumen	Back Lumen	Charge Cycles	Type	Link
Bike Light Set	Team Obsidian	16					Removeable	Link
Blaze 180 SL (USB)	Blaze	40	Rechargeable	180		500	Removeable	Link
Shiner (USB)	Shiner	40	Rechargeable	56			Removeable	Link
Blaze 180 SL (USB) Set	Blaze	70	Rechargeable	180	100	500	Removeable	Link
HOTROD Set	Cygolite	67.45	Rechargeable	110	50		Removeable	Link
Lava Set	Infini	49.99	Rechargeable	80	15		Removeable	Link
DASH PRO + Hotrod	Cygolite	89.95	Rechargeable	600	50		Removeable	Link
STREAK 450 + HOTSHOT SL 50	Cygolite	62.95	Rechargeable	450	30		Removeable	Link

Total Expenses

Total Expenses	3 year w/Tax	5 year w/Tax
Initial Budget	$15,052.94	$15,052.94
Maintenance Budget	$5,101.41	$8,502.34
Marketing Budget	900	1500
Total	$21,054.35	$25,055.29

Startup Budget

Startup Budget	Total	Total W/Tax
Cost	$13,746.98	$15,052.94

This is the initial budget that will be necessary to purchase the bike fleet, equip the bikes with necessary components, and label the bikes with; The Cycle Pack Logo/bike number, sponsor logos, and a bike registration strip which will deter theft and help track down and of the bicycles if they are every stolen. I also put lube and degreaser on the list as these are maintenance products that will be needed to jumpstart the program. Another Item I included is a bike computer which will be helpful in keeping track of the milage of each bike, as well as an indicator for how frequently components will need to be changed in the future. Finally I added a key box in the initial budget because UWild will need to store keys from the ULocks and so key management will be crucial to this process.

Startup Budget	Description	Cost	Qty	Total	Total W/Tax	Link
Bike	Dew Plus	$463.00	20	$9,260.00	$10,139.70	Link
Fenders	Planet Bike Hardcore	38	20	$760.00	$832.20	Link
Lock	Kryptonite Kryptolok Series 2 STD U-Lock with Bracket: 4x9in	$40.95	20	$819.00	$896.81	Link
Lights	Blaze Set	$70.00	20	$1,400.00	$1,533.00	Link
Helmets	Ted	$25.00	20	$500.00	$547.50	
Key Box	Barska 64 Position Key Lock Box with Key Lock, Black	$66.00	1	$66.00	$72.27	Link
Bike Registration	Bike 529 (UW Police Use This)	$10.00	20	$200.00	$219.00	Link
Stickers	Cycle Pack Logo + Sponsor Logos	$52.00	1	$52.00	$56.94	Link
Bike Computer/ Odometer	Planet Bike Protege Computer Black	$23.75	20	$475.00	$520.13	Link
Lube	Boeshield T-9 Lube, 1 Gallon ORM-D	$114.99	1	$114.99	$125.91	Link
Degreaser	Finish Line Citrus Biosolvent, 128oz (1 Gallon) ORM-D	$99.99	1	$99.99	$109.49	Link

Maintenance Budget

The maintenance budget for cycle pack will be crucial to ensuring that our bicycles are both safe and available to students to use. There are many components on a bicycle which eventually wear down. While students will be responsible for any intentional, or negligent damages to the bicycles, as well as lost/stolen equipment/components, regular maintenance/replacements will be at the expense of Cycle Pack.

Maintenance Budget	3 Year	3 Year W/Tax	5 Year	5 Year W/Tax
Per Bike	$232.94	$255.07	$388.23	$425.12
For 20 Bike Fleet	$4,658.82	$5,101.41	$7,764.70	$8,502.34

Approximating repair frequency was done by researching bike blogs and looking at part manuals in order to determine a life span for each component. In using bike blog data, I tried to weigh several opinions against each other in order to find a reasonable average between responses. Through my initial research I found that there is no way to formally claim a component will last a certain milage because milage only paints half the picture. Components are subject to the materials used, the weight of the rider, the weather conditions, the use of the bicycle and many other conditions. While I have attempted to my best ability to determine a lifespan for the above components, there is a large degree of variance in how long the components will actually last.

There were several components that I was unable to find any replacement frequency data on. Due to the fact no data could be found on replacement frequency I made the assumption that these components last a long time. Therefore I assumed these parts would last 10 years. Another element I considered when estimating repair frequency was how different components affect each other. For example, if a chain isn't repaired frequently enough, then the chain will start to deform the cassette.

In order to translate milage to years, I had to calculate how many miles a student would ride a bike in a quarter. In the process I found it necessary to make several assumptions. First, because this program is intended to provide students a commute option to campus, I am assuming students will ride their bike from their homes to class and back. The second assumption is that they will commute monday through friday, or 5 out of 7 days. The final assumption is that students will live within our desired range of .75 to 4 miles from campus. The average of this range being 2.375 miles. Next I calculated the number of weekdays in the service period of a renter which added up to 55. Putting all this data together, I found that 55 days/quarter X 2 trips/day X 2.375 miles/trip = 261.25 miles/quarter. Finally, because there are three quarters Cycle Pack is running per year, I can assume that a bike will be used 783.75miles/year. To be safe in my calculation I rounded this number up to 1000 miles/year when converting Approximate Repair Frequency to Estimated Life Span in Quarters. From this I was able to then calculate yearly repair budget by multiplying (Years X 3 Quarters/Year X Cost) and dividing this by the Estimated Lifespan. Ultimately this results in the cost of the component over a predetermined timeframe, in this estimation, 3 and 5 years.

Part	Description	Cost	Approximate Repair Frequency	Estimated Lifespan (Quarters)	3 Year Cost	5 Year Cost	Link
Crankset (Chainrings + Crankarms + Chain guard)	26/36/48t	$51.75	30000 miles[3]	60	$7.76	$12.94	Link
Pedals	Wellgo Platform	$14.00	?	60	$2.10	$3.50	Link
Chain	KMC X9	$18.00	3000 miles[4] [5]	9	$18.00	$30.00	Link
Freewheel	Shimano Acera 11-34t 9spd	$26.73	8000 miles[6] [7] [8]	24	$10.02	$16.71	Link
F/D	Shimano Altus	$21.51	8000 miles[9]	24	$8.07	$13.44	Link
R/D	Shimano Acera	$37.80	8000 miles[10]	24	$14.18	$23.63	Link
Shifters (Set)	Shimano Acera	$42.93	?	30	$12.88	$21.47	Link
Front Brake Rotor + Caliper + Lever	Tektro HDM285 160mm	$29.00	20000 miles[11]	45	$5.80	$9.67	Link
Rear Brake Rotor + Caliper + Lever	Tektro HDM285 160mm	$29.00	20000 miles[12]	45	$5.80	$9.67	Link
Headset	FSA No.10P	$18.00	10000 miles	30	$5.40	$9.00	Link
Front + Rear (Spokes, Hub, Rim)	Joytech 100x9mm	$197.00	30000 miles[13]	60	$29.55	$49.25	Link
Front Tire	Schwalbe Delta Cruiser 700x35c	$18.49	3000 miles[14]	9	$18.49	$30.82	Link
Rear Tire	Schwalbe Delta Cruiser 700x35c	$18.49	3000 miles[15]	9	$18.49	$30.82	Link
Disc Brake Pads (Set)	Tektro Disc Brake Pads	$15.00	2000 miles[16]	6	$22.50	$37.50	Link
Fenders	Planet Bike Hardcore	$38.00	?	30	$11.40	$19.00	Link
Lock	Kryptonite Kryptolok Series 2 STD U-Lock with Bracket: 4x9in	$40.95	15 years[17]	45	$8.19	$13.65	Link
Lights	Blaze Set	$70.00	8 years[18]	24	$26.25	$43.75	Link
Bike Computer/ Odometer	Planet Bike Protege Computer Black	$23.75	?	30	$7.13	$11.88	Link
Bike Computer/ Odometer Battery	Pack of 20 CR2032 ($8.35)	$0.42	1.5 years[19]	4	$0.94	$1.57	Link

The process I have implemented in estimating the lifespan of components and the resulting cost over a time frame is flawed, but according to my research, there are no standard methods for accurately estimating these costs. The only other method I was informed of was to find the cost of the component package and then estimate the lifespan of the bike and then divide the cost by the life span to find the yearly cost of maintenance. My method is very similar to this, but takes a more

[3] Jeff Poulin, 1.
[4] Ibid.
[5] John Stone, 1.
[6] Ibid.
[7] Andy K, 1.
[8] Jeff Poulin, 1.
[9] Ibid.
[10] Ibid.
[11] Stib, 1.
[12] Ibid.
[13] Jeff Poulin, 1.
[14] Ibid.
[15] Ibid.
[16] Spike Milligan, 1.
[17] Arron, 1.
[18] Planet Bike, "Blaze 180 SL & Superflash USB Light Set," 1.
[19] Planet Bike, *Protege 5.0 Instruction Manual, 1.*

detailed approach to individual components. In the future, to avoid the frustration of not having accurate component replacement data, I plan to use bike computers to track the mileage of the bicycles. This will allow us to track the lifespan of the components we use on the fleet, as well as an average cycling mileage for the Cycle Pack Fleet. With these two variables we will be able to determine a more accurate repair budget in the future. If the Cycle Pack fleet is ever expanded, this data will be crucial in budgeting for the new bicycles. This data may also be useful to other colleges who are thinking of starting their own bike program.

Marketing Budget

Cycle Pack is partnering with EcoReps for promotional materials. In order to aid the organization, I propose setting up a hundred dollar budget per quarter in order to fund printing of promotional materials and other promotional ideas generated either through EcoReps or as a result of Cycle Pack's quarterly meeting. Any unspent money from one quarter will roll into the next making it possible to use this fund to buy promotional tools like Cycle Pack bicycle water bottles, or possibly mini bike lights.

Marketing Budget	3 Year	5 Year
Per Quarter	100	100
Total	900	1500

Revenue

Income	Quarter	Year	3 Year	5 Year
One Bike	$50.00	$150.00	$450.00	$750.00
Twenty Bikes	$1,000.00	$3,000.00	$9,000.00	$15,000.00

Over the course of Cycle Pack's lifespan it will produce a considerable amount of income. It is my intention, that the first few years of the program be use to test out marketing strategies, determine the rate of component decay, and other potential financial considerations that might emerge while the program is running. Then to expand operations when more is known about the variables of the program. The argument could be made for using this money to fund initial repairs and marketing of the bicycle fleet, but without the financial foresight, there will be no way for the program to expand in the near future. Every year the bikes will deteriorate, and there are only so many repairs that can be made before the amount of labor that needs to be performed on the bike is more than the cost of a new bicycle. It will be crucial for Cycle Pack to start building a fund so that the program can function and expand independent of outside funding.

Expansion & Budget Reductions

In order to calculate the potential expansion of the program there were several variables to consider; The initial cost of each bicycle, the yearly cost of maintenance for each bicycle, the revenue generated by each additional bicycle, the maintenance of the bicycles in the fleet, the marketing cost, and the initial CSF grant. In my calculation for expansion, I chose two years at which expansion would occur. The first being year 5 and the second being year 10. Next I considered two usage rates, 75% and 95%. While I hope the usage rate will be 100% I do not expect the program to maintain a 100% rate. This consideration affects the revenue generated by the program. After creating this initial chart, I adjusted the percentage of the CSF budget the program receives in order to predict how reductions in the budget could affect expansion.

Year	Initial CSF Budget (100%)	Maintenance	Fleet Cost	Revenue (Yearly .95% usage)	Marketing Cost	Expansion	Net Yearly Profit
1	$25,055.29	$1,700.47	$15,052.94	$2850	300	20	$10,851.87
2	0	$1,700.47	$0.00	$2850	300	0	$11,701.41
3	0	$1,700.47	$0.00	$2850	300	0	$12,550.94
4	0	$1,700.47	$0.00	$2850	300	0	$13,400.47
5	0	$3,400.94	$15,052.94	$5700	300	20	$346.59
6	0	$3,400.94	$0.00	$5700	300	0	$2,345.65
7	0	$3,400.94	$0.00	$5700	300	0	$4,344.71
8	0	$3,400.94	$0.00	$5700	300	0	$6,343.78
9	0	$3,400.94	$0.00	$5700	300	0	$8,342.84
10	0	$3,400.94	$12,042.35	$7980	300	16	$579.55

The chart above demonstrates the calculations performed in order to derive the two charts below.

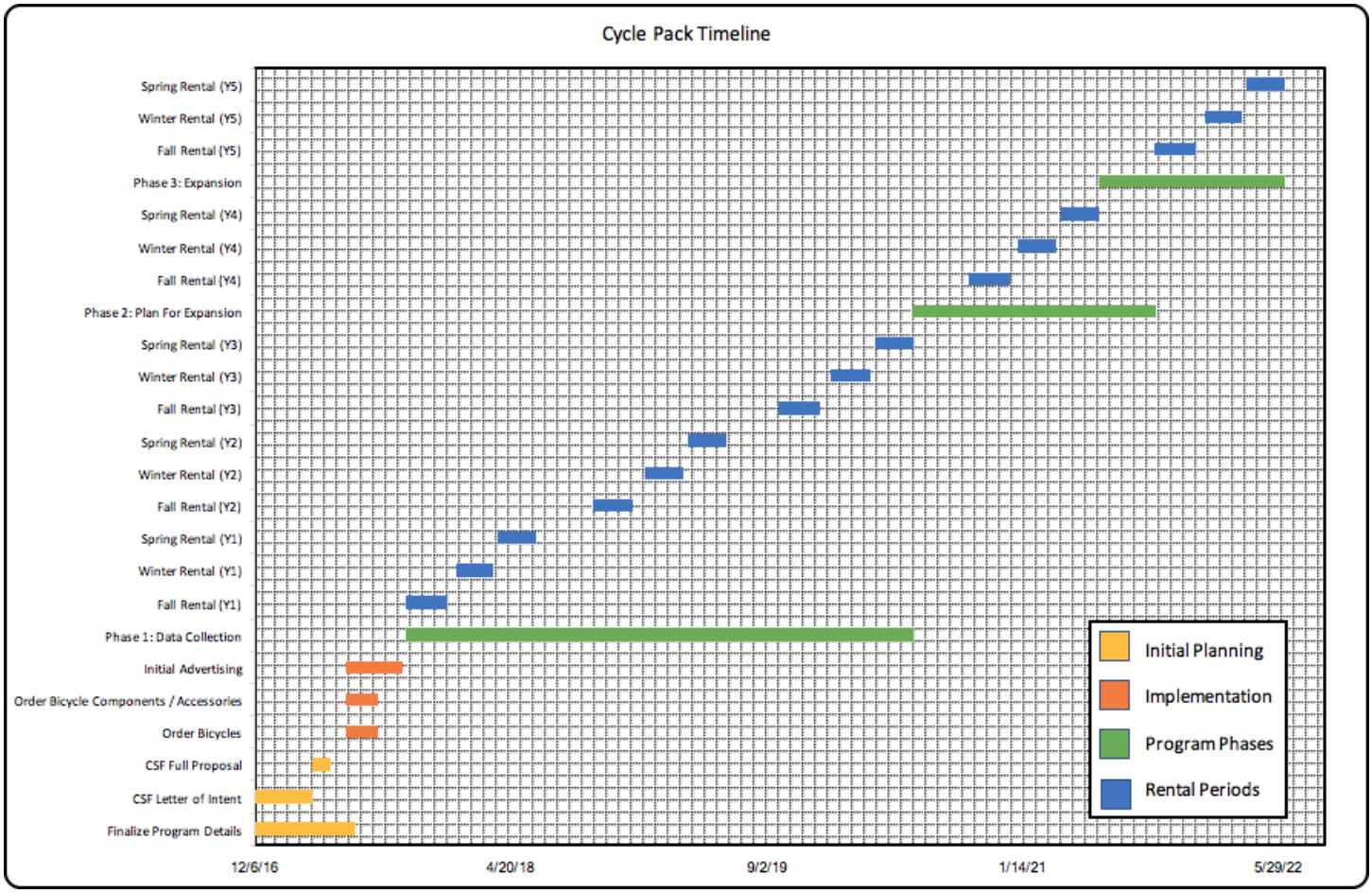
CSF Funding Percent	5 year expansion Max (.75% usage)	10 year expansion Max (.75% usage)	Total Expansion	Total Fleet Size	Percent Increase Over 10 Years
70%	5	3	8	28	40%
75%	6	4	10	30	50%
80%	8	4	12	32	60%
85%	10	4	14	34	70%
90%	12	4	16	36	80%
95%	13	5	18	38	90%
100%	15	5	20	40	100%

CSF Funding Percent	5 Year expansion Max (.95% usage)	10 Year expansion Max (.95% usage)	Total Expansion	Total Fleet Size	Percent Increase Over 10 Years

70%	9	9	18	38	90%
75%	11	12	23	43	115%
80%	13	13	26	46	130%
85%	15	14	29	49	145%
90%	16	15	31	51	155%
95%	18	16	34	54	170%
100%	20	16	36	56	180%

One element that I did not consider in this calculation is the potential change in maintenance costs as data is collected about component decay. Although I do not think that a considerable change in maintenance costs will significantly change the expansion rates I have calculated. From the calculations I performed, at 100% funding from the CSF the program will be able to expand by 20-36 bikes in 10 years, at 75% funding from the CSF the program will be able to expand by 10-23 bikes in 10 years.

Timeline


Cycle Pack Timeline
Spring Rental (Y5)
Winter Rental (Y5)
Fall Rental (Y5)
Phase 3: Expansion
Spring Rental (Y4)
Winter Rental (Y4)
Fall Rental (Y4)
Phase 2: Plan For Expansion
Spring Rental (Y3)
Winter Rental (Y3)
Fall Rental (Y3)
Spring Rental (Y2)
Winter Rental (Y2)
Fall Rental (Y2)
Spring Rental (Y1)
Winter Rental (Y1)
Fall Rental (Y1)
Phase 1: Data Collection
Initial Advertising
Order Bicycle Components / Accessories
Order Bicycles
CSF Full Proposal
CSF Letter of Intent
Finalize Program Details
12/6/16
4/20/18
9/2/19
1/14/21
5/29/22
Initial Planning
Implementation
Program Phases
Rental Periods

Work Cited

Arron. "How long does your U-lock last? - Bike Forums." Bike Forums - A cycling and bicycle discussion forum. Accessed April 21, 2017. http://www.bikeforums.net/general-cycling-discussion/887393-how-long-does-your-u-lock-last.html.

K, Andy. "Realistic life span of components - Bike Forums." Bike Forums - A cycling and bicycle discussion forum. Accessed April 21, 2017. http://www.bikeforums.net/commuting/799084-realistic-life-span-components.html.

Kona. "Dew Plus." Kona World. Accessed April 22, 2017. http://www.konaworld.com/dew_plus.cfm.

Milligan, Spike. "How long should disc brake pads last? - Bike Forums." Bike Forums - A cycling and bicycle discussion forum. Accessed April 21, 2017. http://www.bikeforums.net/general-cycling-discussion/486953-how-long-should-disc-brake-pads-last.html.

Planet Bike. "Blaze 180 SL & Superflash USB Light Set." Planet Bike. Accessed April 21, 2017. http://ecom1.planetbike.com/3082.html.

Planet Bike. *Protege 5.0 Instruction Manual*. Madison, WI: Planet Bike, 2016.

Poulin, Jeff. "Realistic life span of components - Bike Forums." Bike Forums - A cycling and bicycle discussion forum. Accessed April 21, 2017. http://www.bikeforums.net/commuting/799084-realistic-life-span-components.html.

Stone, John. "How many miles will a road bike's chain and cassette last?" John Stone Fitness. October 08, 2014. Accessed April 21, 2017. http://www.johnstonefitness.com/2014/10/07/how-many-miles-will-a-road-bikes-chain-and-cassette-last/.

Stib. "When Should I replace the rotors on disk brakes?" Bicycles Stack Exchange. Accessed April 21, 2017. https://bicycles.stackexchange.com/questions/17981/when-should-i-replace-the-rotors-on-disk-brakes.