ME537 - PRODUCT REALIZATION			
PROJECT NAME	**Bike Rack (ME537 S23)**		
TEAM MEMBERS	Carly Buchanan Cooper Pursley Emerson Daigle Luca Tramontozzi	SUPERVISOR	Professor Thornton
DATE		AUTHORS	Full Team

DOCUMENT TRACKING			
VERSION	EDITS COMPLETED BY	DATE	DESCRIPTION OF EDIT
1.0	Prof. Thornton	01/15/2018	Draft of template
2.0	Carly Buchanan	02/13/2023	Draft for A3 Release
3.0	Cooper & Luca	02/25/2023	Additions for A3
4.0	Carly	03/06/2023	Additions to VoC & Usage Conditions
4.1	Carly	03/11/2023	Additions to Product Specifications & VoC
4.2	Cooper Pursley	03/15/2023	Additions to Product Specifications
4.3	Luca Tramontozzi	03/19/2023	Additions to Aesthetics and Usage Conditions
4.4	Cooper Pursley	04/09/2023	Updates to Packaging

Links to other Specification documents			
Doc #	Name	Link	Description

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1.0 Product Brief

We are delivering a bike accesorry that will make it easier to securely mount a standard backpack to a bicycle. The platform will be affordable to replace needing to buy expensive, specialized bike bags. It will also be portable and can be easily removed from the bike and stored in a backpack for safe-keeping

2.0 Brand

The brand of the product should communicate practicality and affordableness. The product should appear to provide a beneficial use for a reasonable price (vs going without the product for no price)

3.0 Stakeholder

	Stakeholder	Description	Who are they	What do they value?
3.01	User / Purchaser	who consumes the product	College students / Young Adults 18-25	Cost of the product, not having to bike with a heavy bag on their back, portability reduces theft
3.02	User	who consumes the product	Middle school - high school students 11-18	not having to bike with a heavy bag on their back, their parents' willingness to buy it, looks cool, ease of use (speed of setup/teardown)
3.03	User / Purchaser	who pays for the product	Parent of middle school - college student	Cost of product, product gets used by giftee (provides benefit)
3.04	User	who consumes the product	Adults, casual cyclists who don't want to purchase cycling panniers/bags	Not having to bike with a heavy bag on their back, low cost justifies itermittent use, easy to use without manual/instructions

3.05	Influencer	influence the users	Instagram/Tik-Tok influencers	Product looks good in videos
3.05	Influencer	influence the users	User's classmates	not having to bike with a heavy bag on their back
4.0 Key Partners and Suppliers				
	Partner	Role/ Contribution		Notes
4.01	McMasterCarr	Parts Supplier		Currently buckles, slides, washers, rivets
4.02	Home Depot	Parts Supplier		Current source for wood, wood sealer, rivets
4.03	Strapworks via Amazon	Parts Supplier		Source for webbing straps
4.04	Amazon	Parts Supplier		Current source for hook loop, slides
NOTES				
	Initiator	recognizes the value of a product		
	Gatekeeper	gives information to the DMU		
	Decider	who makes the purchasing decision		
	Influencers	influence the users		
	Purchasers	who pays for the product		
	Users	who consumes the product		

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PROJECT NAME	**Bike Rack**
5.0 Voice of the customer	
5.01	install should be obvious and error proof.
5.02	The product should survive at least a year of regular use, including rain, cold, hot weather, and potholes.
5.03	The product should be easy to install & remove without needing to carry tools on hand.
5.04	The product will not interfere with normal use of the bike, e.g. it will have clearance for the user sitting on the seat and for pedaling, straps will not become entangled.
5.05	The product must be able to be mounted securely & tightly with no looseness, wiggling, or jostling. It must not slide off or partially off rack in any direction.
5.06	Any straps must have length long enough to use easily and securely, but there must not be loose straps flapping freely while in use.
5.07	Product should be quiet in use without rattling noises.
5.08	Surface finishes must be durable. Metal must not rust. Coatings must not chip, rub, or flake off. They especially must leave no marks of any kind on the held backpack.
5.09	Product must survive (no cracks or other structural damage) wear and tear such as bumps against the wall while wheeling out of garage and the bike falling from kickstand with no backpack loaded.
5.10	User should not get scratched by product, there should be no sharp or pokey bits.
5.11	The product should be able to support common varieties of standard backpacks.
5.12	The product should discourage theft by being hard to remove or easy to take with user.
6.0 Key features, functional and capabilities	
6.01	The product will support a flat-laying backpack
6.02	The product will securely hold a backpack.
6.03	The product will securely attach to a bike rack without tools.
6.04	The product will be portable, defined as able to be stowed in a backpack, ideally within a water bottle pocket.
6.05	The unit needs to mount securely to a bike rack with minimal wiggling/looseness even during sharp starts, stops, and bumps. Assume collisions, potholes, sudden braking, and swerving. Motion must be constrained in all axes, including side-to-side, front-to-back, and vertically.
6.06	The product should discourage, fail safetly, or being able to fully function if a passenger attempts to sit and ride on the unit.
6.07	The unit may be bumped or leaned against a wall / pole.
6.08	The unit must not have any sharp corners or edges that could injure a user, damage a bag, fray a strap, or scratch paint.
6.09	The unit may be squished, crushed, bumped, or jostled while stowed in its compact form.
6.10	The product will be weather proof such that it can sustain prolonged periods of rain, snow, or direct sun
7.0 Product compatibility with other products / systems	
7.01	Will fit bicycle racks of width 5" to 7"
7.02	Will fit bicycle racks of length 11" to 16" (flat length only)
7.03	Will fit bicycle racks with tubing on the sides
7.04	Will fit bicycle racks with side tube diameters of 0.315" (8mm) to 0.63" (16mm)
7.05	Will fit bicycle racks with a bar on the front
7.06	Will work with backpacks 10" to 14" in width
7.07	Will work with backpacks 4" to 12" in depth
7.08	Will work with backpacks 14" to 22" in height
7.09	Product will not break under normal operating conditions when holding backpacks equal or lighter than 45lb
7.10	Product will fit in standard water bottle pockets (for bottle diameters ~3")

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PROJECT NAME	Bike Rack									
14.0 Product Specifications										
	Specification	Units	Target	Min	Max	Type [1]	VoC	Key Features	Compatability	Usage
14.01	Platform Unfolded Width	in	13	11	14	Target the Mean	5.11	6.01	7.01 7.04	18.01
14.02	Platform Unfolded Length	in	12	11	13	Target the Mean	5.04 5.11	6.01	7.02 7.06	18.01
14.03	Platform Folded Width	in	3	2	3.5	Target the Mean	5.12	6.04	7.08	18.05
14.04	Platform Folded Height	in	13	11	14	Target 14.01	5.12	6.04	n/a	18.05
14.05	Platform Folded Thickness	in	2.5	1.5	3.5	Target the Mean	5.12	6.04	7.08	18.05
14.06	Platform Weight	oz	24	n/a	36	LTB	5.12	6.04	n/a	18.05
14.07	Force to dislodge platform from bike rack	lbf	200	100	300	HTB	5.02 5.05 5.07 5.09 5.11	6.02 6.03 6.05 6.06 6.07	 7.03 7.07	18.01 18.09 18.10 18.11 18.12
14.08	Platform side-to-side allowable movement	in	0.25	0	0.5	LTB	5.02 5.05	6.05 6.07	7.01 7.03	18.09 18.12
14.09	Platform front-to-back allowable movement	in	0.25	0	0.5	LTB	5.02 5.05	6.05 6.07	7.02 7.03	18.09 18.12
14.10	Cargo side-to-side allowable movement	in beyond platform	1	0	1.5	LTB	5.02 5.05 5.11	6.01 6.02 6.05	7.04 7.05 7.06 7.07	18.15 18.16 18.17 18.19
14.11	Cargo front-to-back allowable movement	in beyond platform	1	0	1.5	LTB	5.02 5.05 5.11	6.01 6.02 6.05	7.04 7.05 7.06 7.07	18.15 18.16 18.17 18.19
14.12	Time to mount connectors to bike	sec	10	n/a	30	LTB	5.01 5.03 5.12	6.03 6.05	n/a	18.01
14.13	Time to remove connectors from bike	sec	5	n/a	15	LTB	5.01 5.03 5.12	6.03 6.05	n/a	18.01
14.14	Time to secure cargo	sec	15	n/a	30	LTB	5.01 5.03 5.12	6.03 6.05	n/a	18.01

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14.0 Product Specifications										
	Specification	Units	Target	Min	Max	Type [1]	VoC	Key Features	Compatability	Usage
14.15	Time to remove cargo	sec	5	n/a	10	LTB	5.01 5.03 5.12	6.03 6.05	n/a	18.01
14.16	No Surfaces Capable of Producing Lacerations	n/a	0	-	-	LTB	5.10.	6.08	n/a	18.05 18.13
14.17	Cargo Weight	lb	45	0	45	HTB	5.02 5.11	6.02 6.05 6.06	7.07	18.07 18.12 18.15 18.16 18.17 18.21 18.22
14.18	Customer with standard hearing does not hear rattle at ride of moderate speed on smooth, paved surface.	y/n feedback	no rattle	no rattle	minor rattle audible, but customer is not disturbed / does not notice	LTB	5.07			
14.19	Time to secure cargo (with strap adjustment)	min	1	n/a	3	LTB	5.01 5.03 5.12	6.03 6.05	n/a	18.01
15.0 Selected components										
	Part	Supplier	Per unit cost target	Link to specification	Other notes and information					
15.01	Plywood Slats (x4)	Home Depot	$3.00	14.01 14.02 14.03	Purchase larger piece such as 4'x8' and cut down					
15.02	Slat sealant	Home Depot	$2.00	14.29 14.30 14.31 14.32 14.33						

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14.0 Product Specifications										
	Specification	Units	Target	Min	Max	Type [1]	VoC	Key Features	Compatability	Usage
15.03	Webbing Straps	Amazon	$1.50	14.09 14.10 14.12 14.13 14.34 14.35 14.36 14.37						
15.04	Buckles	McMaster-Carr	$0.40	14.14 14.15						
15.05	Slides	Amazon	$0.15	14.16						
15.06	Fasteners - Rivets	McMaster-Carr	$0.45	14.41 14.42 14.43						
15.07	Fasteners - Washers	McMaster-Carr	$0.30	14.41 14.42 14.43						
15.08	Connectors - Hook & Loop	McMaster-Carr	$2.00	14.38 14.39 14.40						
		TOTAL:	**$9.80**							

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PROJECT NAME	**Bike Rack**			
18.0 Usage scenarios				
	Condition			
18.01	Platform will be attached to bike racks			
18.02	Platform will be used outdoors in winter weather with freezing temperatures (20-30F), snow, ice, and salt spray from road melt			
18.03	Platform will be used outdoors in the rain			
18.04	Platform will be used outdoors in direct sun in summer (80-90F)			
18.05	Platform will be able to be folded/rolled up when not in use, should not damage any container such as backpack (side pocket or main compartment)			
18.06	Platform in backpack side pocket may be hit or crushed against wall			
18.07	Platform in backpack side pocket may be placed on the floor with the weight of backpack & contents on top			
18.08	Platform may be stored indoors or outdoors when not in use, outdoor not encouraged			
18.09	Platform installed on bike should be able to be leaned up against wall/pole with no issues			
18.10	Platform installed on bike may take impact if bike falls over from kickstand position			
18.11	Platform installed on bike may take impact if bike is in collision			
18.12	Platform installed on bike will take impact loads from traversing over potholes, railroad tracks, tree roots, etc			
18.13	Platform may be stored loose in a bag, box, or car trunk, possibly with other belonging. It may be jostled or shaken while stowed in this manner.			
18.14	Platform may be dropped to the ground (likely from about waist height)			
18.15	Backpack may contain large rigid items (notebook, binders, laptops)			
18.16	Backpack may contain only small or compressible items (agenda, pencil bags, snacks, squishy jacket or sweater, etc)			
18.17	Cargo may be something other than a backpack			
18.18	Platform will be sprayed by substances from the road including small stones, gravel, dirt, mud, and oil slick			
18.19	Platform will experience significant vibration from bumpy/uneven roads			
18.20	Platform may experience exposure to substances from the user such as sweat and spilled substances (water, drinks, sunscreen, etc.)			
18.21	Customer may attempt to attach bag that is smaller than target minimum bag size			
18.22	Customer may attempt to attach bag or container with non-enclosed contents (cardboard box, water bottle in backpack pocket)			

19.0 Shipping requirements			
	Condition	Values	
19.01	Temperature Range	0°F to 100°F (-18°C to 38 °C)	Heat does not degrade properties of slats, webbing or fasteners
19.02	Humidity [2]	0-100%	Humidity and humidity cycling does not degrade properties of slats, webbing or fasteners
19.03	Maximum Temp/Humidity	120/100% RH	Slats, webbing, and fasteners survive maximum conditions without degrading
19.04	Water / dust	Weatherproof treatment/paint wears	Must be fully water/weatherproof while in storage so slats and webbing maintain performance if water gets into packaging
19.05	Drop Shipping Test	Pass Testing Method	ASTM D5276-19
19.06	Vibration	Product should survive vibration durin	No functional or aesthetic damage to product

20.0 Environment: Transport/Storage in gift box			
Conditions: Product in gift box, in shipping box, fully assembled. Minor aesthetic damage only. Passes all functional tests			
	Condition	Values	Comments and other conditions
20.01	Temperature Range [3]	0°F to 150°F (-18°C to 60 °C)	Heat does not degrade properties of slats, webbing or fasteners
20.02	Humidity [4]	0-100%	Humidity and humidity cycling does not degrade properties of slats, webbing or fasteners
20.03	Maximum Temp/Humidity	120/100% RH	Slats, webbing, and fasteners survive maximum conditions without degrading
20.04	Drop	Drop Height - 4 ft	Should survive if dropped while in transport/storage

20.05	Water / dust	Weatherproof treatment/paint wears	Must be fully water/weatherproof while in storage so slats and webbing maintain performance if water gets into gift box
20.06	UV exposure	Weatherproof treatment wears off or	Treatment of wood or wood itself should not degrade in sunlight through gift box
20.07	Drop Shipping Test	Pass Testing Method	ASTM D5276-19
20.08	Vibration	Product should survive vibration durin	No functional or aesthetic damage to product
21.0 Environment: Operational			
Conditions: Product is assembled and operational. Minor aesthetic damage only. Passes all functional tests.			
	Condition	Values	Comments and other conditions
21.01	Minimum Temperature [5]	Min -10F, Max 30F, Target 20F, LTB	
21.02	Maximum Temperature	Min 90F, Max 150F, Target 100F, HTB	Heat does not degrade properties of slats, webbing or fasteners
21.03	Humidity [6]	0-100%	Humidity and humidity cycling does not degrade properties of slats, webbing or fasteners
21.04	Maximum Temp/Humidity	120/100% RH	Slats, webbing, and fasteners survive maximum conditions without degrading
21.05	Vibration	Pass Testing Method and In House Testing	ASTM D3580. Must be able to withstand vibration of being attached to bike rack while traveling over bumpy/uneven road for duration of commute
21.06	Slat water resistance	Min 0.1% absorption by weight, max 0.5%, LTB	Must be fully water/weatherproof while in use so slats and webbing maintain performance
21.07	Other component water resistance	No stretching, no color running	Must maintain functional properties while wet and after wet/dry cycles. No loss of flexibility or strength. May have changes in appearance, so long as color is not transferred to cargo, bike, rack, or user.
21.08	Slat finish hardness	min 0in, max0.143in, target0.0715in	After finish has fully cured
21.09	Abrasion Resistance	No color depositing on cargo, no functional damage	No color will be deposited onto cargo, bike, rack, or user. No finishes will flake or chip. Straps may aesthetically become fuzzy but must retain their functional properties.
21.10	Drop	Drop Height - 4 ft	Should survive or have fail safe if user crashes bike with product installed and cargo mounted
21.11	Loading	45 lb load	Must be able to support 45 lb backpack load while bike is moving
21.12	Impact Resistance Shear Resistance Tension Resistance	Min300lbf, Max500lbf, Target400lbf, HTB	Slats, straps, connectors, buckles, fasteners must be able to resist impact of 45 lb backpack dropped from 4 feet while bag is on rack. Cargo must stay tightly secured. Straps must not stretch or tear, buckles must not slip, slats must not crack or take structural damage, holes in straps and hookloop must not enlarge, rivets must not pull through materials.
21.13	UV exposure	max: (0.5hr * 2/day * 3day/wk * 52wk/yr) = 156hr direct sunlight	Slats, straps, rack connectors, and fasteners must retain performance properties. Aesthetic degradation allowed.
21.14	Chemical resistace	Salt water, road surface oilslicks & contaminents, sweat	No rust or corrosion, no damager to functional properties, aesthetic degradation allowed.
22.0 Environment: Non operational - storage or transport			
Conditions: Product is assembled and stored indoors or outdoors on bike or on floor (outdoors not recommended)			
	Condition	Values	Comments and other conditions
22.01	Temperature Range [7]	0°F to 150°F (-18°C to 60 °C)	Heat does not degrade properties of slats, webbing or fasteners
22.02	Humidity [8]	0-100%	Humidity and humidity cycling does not degrade properties of slats, webbing or fasteners
22.03	Maximum Temp/Humidity	120/100% RH	Slats, webbing, and fasteners survive maximum conditions without degrading
22.04	Drop	Drop Height - 4 ft	Should survive if dropped while in transport/storage
22.05	Water / dust	Weatherproof treatment/paint wears	Must be fully water/weatherproof while in storage so straps and webbing maintain performance
22.06	UV exposure	Weatherproof treatment wears off or	Treatment of wood or wood itself should not degrade in sunlight
22.07	Impact Resistance	Slats break, webbing rips off	Must be able to resist impact of 45 lb backpack dropped from 3 feet while rack is in storage, or if hit against object while in water bottle pocket
23.0 Warranty and reliability targets			
Warranty period	The product will have a 6 month warranty with an expected usage of 1 year.	**Target return rate**	**10%**	**Target reliability rate**	**90%**

24.0 Cycles over warranty period			
	Operation	Cycles per warranty period	Comment
24.01	Fold Platform	650	Estimated number of cycles given 1 year of use (4 times a day * 3 days a week)
24.02	Strap Buckling	650	Estimated number of cycles given 1 year of use (4 times a day * 3 days a week)
24.03	Hook & Loop	650	Estimated number of cycles given 1 year of use (4 times a day * 3 days a week)
24.04	Platform Unfolded and Loaded on Rack	650	Estimated number of cycles given 1 year of use (4 times a day * 3 days a week)
24.05	Cold Cycling from 68F to 0F and back	200	Estimated number of cycles given 1 year of use with a third of the cycles in cold weather

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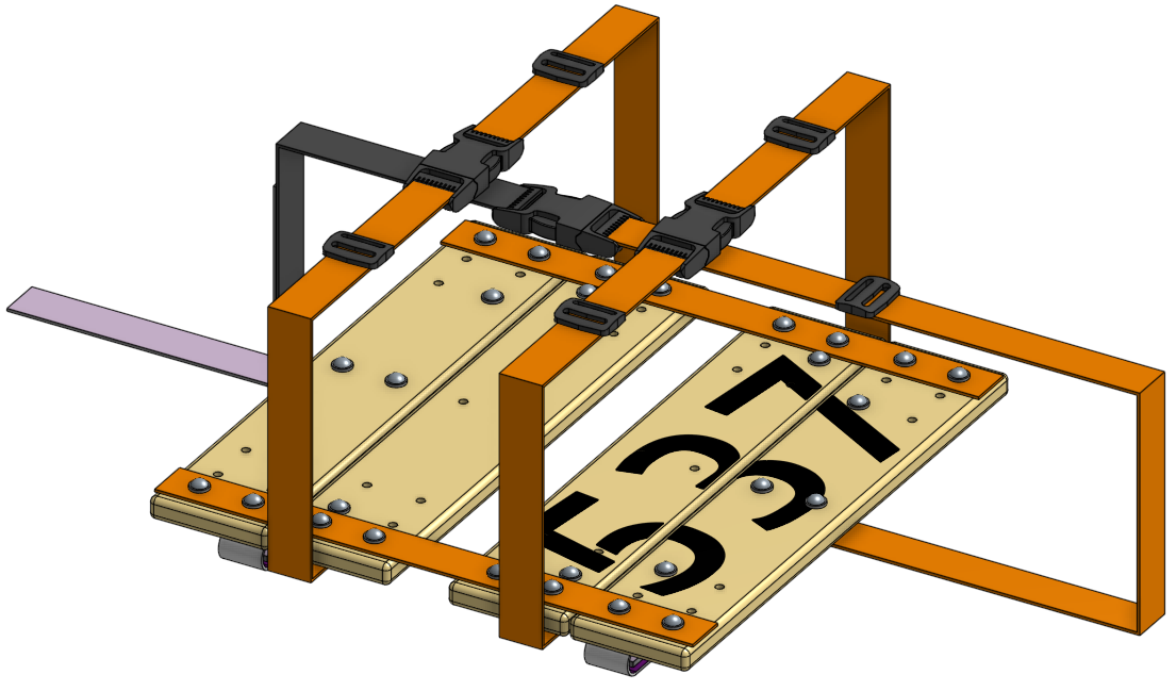
PROJECT NAME	**Bike Rack**

8.0 Renderings



9.0 Color material finish

Straps - Lightweight Polypropylene Orange & Lightweight Polypropylene Black
Slats - clear finish over wood, black stenciling
Buckle - matte black plastic
Slides - matte assorted colors, pairs matching

10.0 Logo and marketing placement

Logo on face of slat(s)

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PROJECT NAME	Bike Rack Platform	

11.0 Gift Box/Packaging. Picture and description

The platform will be placed, with outside slats folded, inside a mesh bag hanging under a paperboard stock header card. The mesh bag will be sewn to the header card. Branding and graphics will be placed on the header card.

12.0 List of what is included in the gift box

	Part name	Part description
12.01	Product	One unit
12.02	Quick start guide	One page color sheet that describes how to use and install the product on a bike rack. This will be folded and placed inside the mesh bag.

Shipping and other packaging

	Part name	Part description
3.01	Master carton	48x40x36 standard master carton. Marked with required shipping information.
3.02	Inner pack	16x8x12. Inner pack that contains 6 gift boxes. Marked with the SKU information (sticker).

Other packaging information

The mesh bag is 8" wide by 16" long with room to expand 2". The header card is 8" wide by 3" tall. The hanger can be folded over the mesh bag when the gift box is stored inside the inner pack.

6 gift boxes can fit inside one inner pack. 45 inner packs can fit inside one master carton.

Packaging Cost

			Cost Per Box							
Mfr.	**Part**	**Dimensions [in] L x W x H**	**5**	**25**	**100**	**250**	**500**	**1000**	**Mfr. Part #**	**Link**
Uline	Inner Pack	16 x 8 x 12	N/A	$1.62	$1.50	$1.36	$1.28	$1.22	S-20489	https://www.uline.com/Product/Detail/S-20489/Corrugated-Boxes-200-Test/16-x-8-x-12-Corrugated-Boxes
Uline	Master Carton	48 x 40 x 36	$41.00	$39.00	$36.00	$35.00	$33.00	N/A	S-4812	https://www.uline.com/BL_426/Uline-Easy-Loader

PROJECT NAME	Bike Rack Platform

13.0 Dates and volume targets

Date	Stage	Volumes	Comments
3/16/2023	EVT	1	First product ready with finalized CAD
4/6/2023	DVT	2	
5/2/2023	PVT	10	Optimize design to prepare for MP
6/1/2023	MP - first month	500	Date based on tooling lead times
7/1/2023	MP	800	Increase by 300 units/month
8/1/2023	MP	1300	Increase by 500 units/month

14.0 Cost targets

Number	Category	Description	Target	Description
14.01	NRE	Non recurring engineering	$16,010.00	[Development] prototypes, development labor (4 engineers @ $42/hr), [Quality] testing equipment ($2k), testing labor (5 employees @ $20/hr), [Operation] overhead ($5k/month)
14.02	Fixture Costs	total fixture costs to hold materials and for final assembly	$286.57	Acrylic & MDF fixtures, see tooling plan
14.03	COGs - Launch	BOM Cost + assembly labor, overhead	$25.00	Approximated per unit costs for BOM plus assembly labor and overhead
14.04	COGs - 6 months	BOM Cost + assembly labor, overhead	$8.00	Bulk ordering reduces material costs, labor is more efficient. Mass manufacturing est approximately $17/unit savings on materials
14.05	Landed costs	Cost to get to the customer	$5.00	Shipping cost
14.06	Price to distributors	How much distributors like amazon are charged	$2.50	10% of Sales Price
14.07	MSRP	Target retail price?	$25.00	Cost should be preferable to 1. buying a pannier bag and 2. buying a hiking bag (more breathable and easier to carry for extended times). Both daypacks and pannier bags which hold comparable volume start around $55-80 depending on brand and material quality (LL bean, REI, osprey). Discounts can go down to $30 on amazon for lesser known brands
14.08	Acceptable Margin	How much do you need to earn when selling a unit?	$6.25	Profit margins in the sports/outdoor industry estimated 25-30%
14.09	Profit with Above Information	Does this match the acceptable margin or is higher (ideal case)?	$9.50	This exceeds the needed value defined above

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16.0 Countries of Sale

USA

17.0 Certifications

Number	Classification	Country	Comments
17.01	CARB ATCM	US	Emission standards for composite wood
17.02	TSCA Title VI	US	Emission standards for composite wood
17.03	ASTM D1761-20	US	Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials
17.04	Calif Prop 65	US	In regards to Varathane sealer used to protect wood slats
17.05	US DOT - Title 49.Subtitle B.Chapter III.Subchapter B. Part 375	US	Transportation of Household Goods in Interstate Commerce; Consumer Protection Regulations

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25.0 Spare and repairs

Once in mass production, rack will be cheap enough to send the customers one replacement within the warranty period. Customer will pay shipping costs.

25.0 How is the product going to be supported

Customer will submit claim for replacement by emailing customer service. Customer service will be sure to acquire a picture from customer displaying issue with product. Customer Service will determine if product is eligible for replacement under warranty and will ship to customer after collecting payment for shipping costs.

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PROJECT NAME	**Bike Rack**				
NOTES	Link to aesthetic inspection criteria and examples LINK				
26.0 Aesthetic					
	Defect	Suface classification	Max defect allowed	Max count allowed	Critical/Major/ Minor classification
26.01	Cracks	A-D	None	None	Critical
26.02	Burrs/sharp edges	A-D	None	None	Critical
26.03	Rust	A-D	None	None	Critical
26.04	Needle Found in Ite	A-D	None	None	Critical
26.05	Tears in Straps	A-D	None	None	Critical
26.06	Blistering/Peeling	A-D	None	None	Critical
26.07	Fraying of Straps	A-C	None	None	Major
26.08	Dents	A-D	None	None	Major
26.09	Scuff	A	None	None	Major
26.1	Scuff	B,C	1/4"	2	Minor
26.11	Scratches	A	None	None	Major
26.12	Scratches	B,C	1/8"	2	Minor
26.13	Nicks	A	None	None	Major
26.14	Nicks	B,C	1/8"	2	Minor
26.15	Burn	A,B	None	None	Major
26.16	Burn	C	1/4" radius mark	2	Minor
26.17	Orange Peel	A,B	None	None	Major
26.18	Orange Peel	C	Permissable within any rivet holes	Any (in holes)	Minor
26.19	Runs/Drips	A-D	None	None	Major
26.2	Stains	A,B	None	None	Major

26.21	Stains	C	Any	Any	Minor
26.22	Discoloration	A,B	None	None	Major
26.23	Discoloration	C	Any	Any	Minor
26.24	Roughness/Surface	A-C	All Surfaces will have a surface roughness (Ra) of 6.3 um or better	No defects greater thar	Major
26.25	Streaking	A,B	None	None	Major
26.26	Streaking	C	Any	Any	Minor
26.27	Gloss Variation	A-C	Finishes on all exposed surfaces will be medium gloss with no more than one dust inclusion per square inch	None allowed beyond s	Major
26.28	Tool Marks	A	None	None	Major
26.29	Tool Marks	B,C	1/8"	2	Minor
26.3	Missing Stitching	A-D	None	None	Major
26.31	Uneven Stitching	A-C	Stitches allowed to be within 5 degrees of intended line of stitch. Stitch length will be within . 1mm of 2.5 mm	None beyond spec	Minor

[1] LTB - lower the better, HTB - higher the better, No indication, target the mean

[2] Low temp low humidity

[3] High temp. High humdity

[4] Low temp low humidity

[5] High temp. High humdity

[6] Low temp low humidity

[7] High temp. High humdity

[8] Low temp low humidity