Inclusive Bike - Group A3.3

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Key Components of Project Deliverables: Problem statement

Our device helps wheelchair users navigate Ottawa’s trails with ease. The attachment will hold a wheelchair while the client’s aide can take them on rides. The design is easy to operate and makes the user feel safe with advanced safety features.

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Key Components of Project Deliverables: Customer needs

- Client will not be able to participate in pedalling or turning
- Client requested that the design will be able to be attached to a normal bicycle
- Client requested a platform for their wheelchair to be placed on and secured to during rides
- Client requested that the design is durable
- Client requested safety features for the attachment

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Key Components of Project Deliverables: Benchmarking

Producer	Clever Tricycle-Machinery Factory	Christiana	Riese & Mueller
Product			
Price(CAD$)	1288.52	3190.00	12059.00
Dimensions(mm)	2180*850*1100	2080*870*1170	2490*Width depends on the front box*590
Weight(KG)	75	29	27.5
Power	Electric powered	Human powered	Electric powered
Material	Strong steel	Stainless steel	unknown
Wheels	3	3	2

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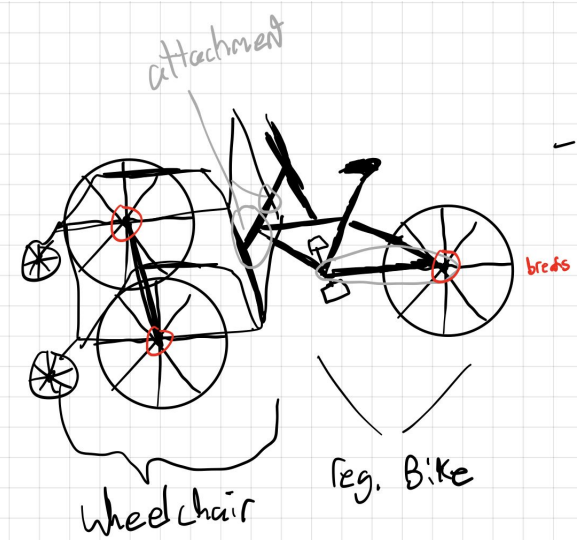
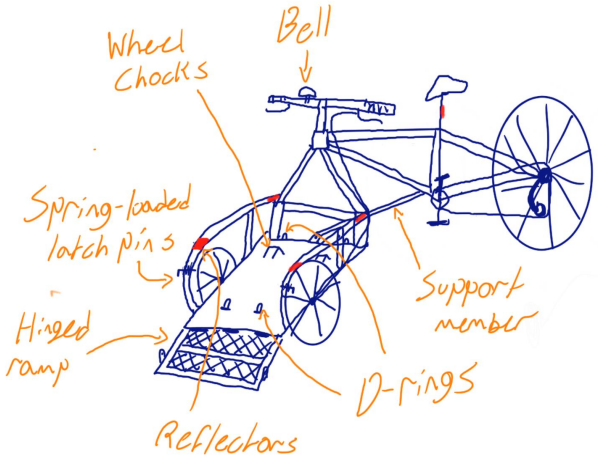
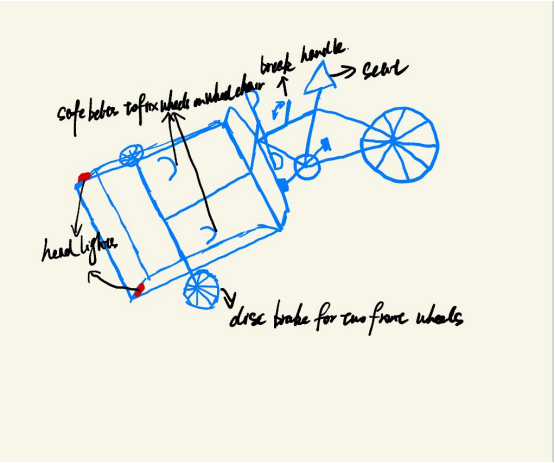
Key Components of Project Deliverables: Design concepts







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Key Components of Project Deliverables: Target specifications

Specification	Details
Attachable to bicycle	Must be able to latch onto a typical bicycle for easy usage
Wheelchair user will not participate in biking	Due to client disability, the client will not be able to participate in the biking and can only sit
Material must be durable	Material must be strong enough to support wheelchair + any other required parts
Must have sufficient safety features	Must include safety features as required, such as reflective bands, lights and restraining belts
Bicycle rider must have full control of bike	Bicycle rider must be able to turn and move bike efficiently
Must be lightweight and collapsible	The attachment must not be too heavy and should be collapsible for easy storage

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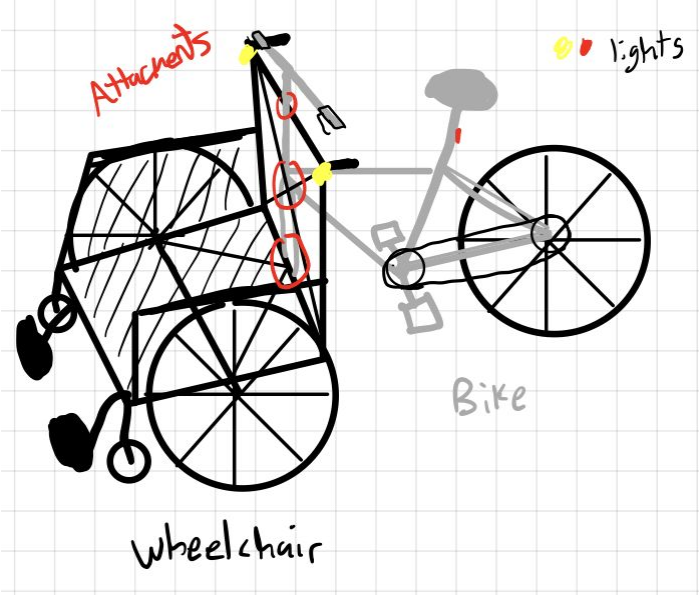
Key Components of Project Deliverables: Concepts

Original Concept



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Initial project plan

- To create a simple feasible product
- To attach a wheelchair to a bike
- To have a physical product by the third client meeting
- To provide an universal attachment

K

Client feedback and what needs to be changed

- The client doesn’t want any more attachments on their wheelchair
- The client wants to feel safer while using the device
- Insists on using a platform style attachment
- Insists on remaining in front of driver

Clear plan for the development of your prototypes

- Fabricate main structure
- Test and refine the steering/mounting system
- Add brakes and other accessories
- Road and durability testing

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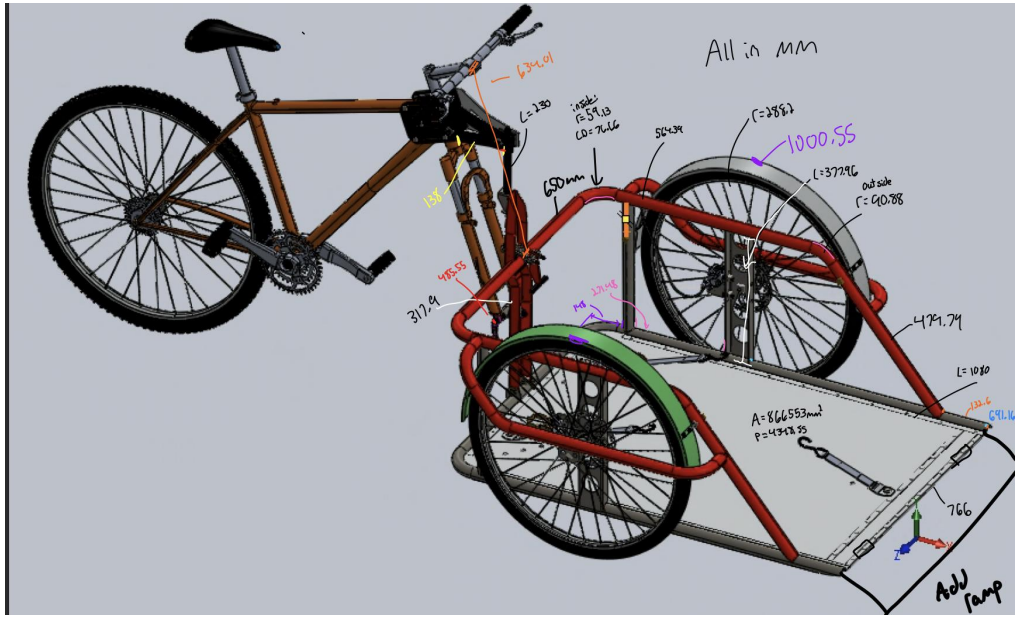
Updated prototypes



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Second prototypes

BOM

Item	Quantity	Need	Cost $	Link
Fork attachment	1	To attach the bottom of the fork to platform	$30	Swagman "The Claw" Fork Mount : Amazon.ca: Sports & Outdoors
Frame structure	Approx 25 feet	Steel tubing, to build the frame of the carriage	~$50	https://makerstore.ca/shop/ols/products/round-tube-steel-per-inch/v/RF008-D3-4
Frame structure		Steel square tubing (or angle iron) to build the frame of the carriage	$0.32 x 1 inchx48 =$15.36	https://makerstore.ca/shop/ols/products/square-tube-steel-per-inch
Platform bottom sheet and ramp	1	For the bottom of the carriage 76x1080cm Ramp for the wheelchair to get on platform 61cmx77	$60	HDPE Plastic Sheet (5 Sheets) 12" x 24" x 1/4" - Black Marine Board - ProTech Plastic : Amazon.ca
Wheels	2	To support platform and allow it to role with the bike	$64.99 x2 = $129.98	Wheel Shop Alex Ace17/Formula FM-31 26-inch Rear - Bike Depot
26" tire	2	Tries for the wheels	$26.99 x 2 = $53.98	Vee Tire Co. Street - The Bike Shop
Wheel axles	1	Axles for the wheels	$12.99	https://www.amazon.ca/Rowiz-Release-Bicycle-Hollow-Mountain/dp/B07KMTX4BP/ref=sr_1_7?crid=2WEUXA6GS0XT9&keywords=quick+release+axle&qid=1665365739&qu=eyJvc2MiOiI0LjQwdiwicXNhIjoiMy41NSIsInFzcCI6IjIuNzUifQ%3D%3D&sprefix=quick+release+axle%2Caps%2C144&sr=8-7
Bolts	25	For holding materials together	$6.24	Everbilt 3/8 in.-16 x 1 in. Zinc Plated Hex Bolt (25-Pack) 800820 - The Home Depot

Hinge	2	To attach the ramp to carriage	$5.49 x 3 = $16.47	https://www.lowes.ca/product/door-hinges/onward-full-mortise-butt-hinge-4-in-102-mm-brushed-chrome-1802773
Latches	2	To hold ramp up which riding	$4.55 x 2 = $9.10	Everbilt 3-1/2 in. Zinc-Plated Adjustable Staple Safety Hasp 15122 - The Home Depot
Straps	4	To hold down wheelchair to carriage	$19.98	https://www.homedepot.ca/product/husky-1-inch-x-12-ft-ratchet-tie-down-4-pack/1001031415?ejd=PS_GO_140203_ALL_PLA-526641&pid=1001031415
Bike Disc Brake Kit	1	For the carriage to be able to slowdown this the bike	$46.99	RUJOI Bike Disc Brake Kit, Aluminum Front and Rear Caliper, Full Aluminum Alloy Bicycle Brake Lever, 160mm Rotor, Mechanic Tool-Free Pad Adjuster for Road Bike, Mountain Bike : Amazon.ca
Total Cost			$513.61	
New cost				

Price before buying a bike $207.15

Plan for moving forward

- Continue to work to developing our physical prototype (Now-Design day)
- Order/scavenge required parts and materials (this week)
- Show clients where we are and our future plans (next next week, November 3rd)
- Continue completing deliverables
- Start documenting project details
- Start preparing for design day

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Decision matrix

-Vote for best design

-What's the most feasible

-What meets the requirement the best

Feasibility study

Who?

Two clients in wheelchairs

What?

Want to bike outside

When?

During nice warm weather

Why?

So they can enjoy the experience of biking

Where?

Ottawa's parks, streets, paths

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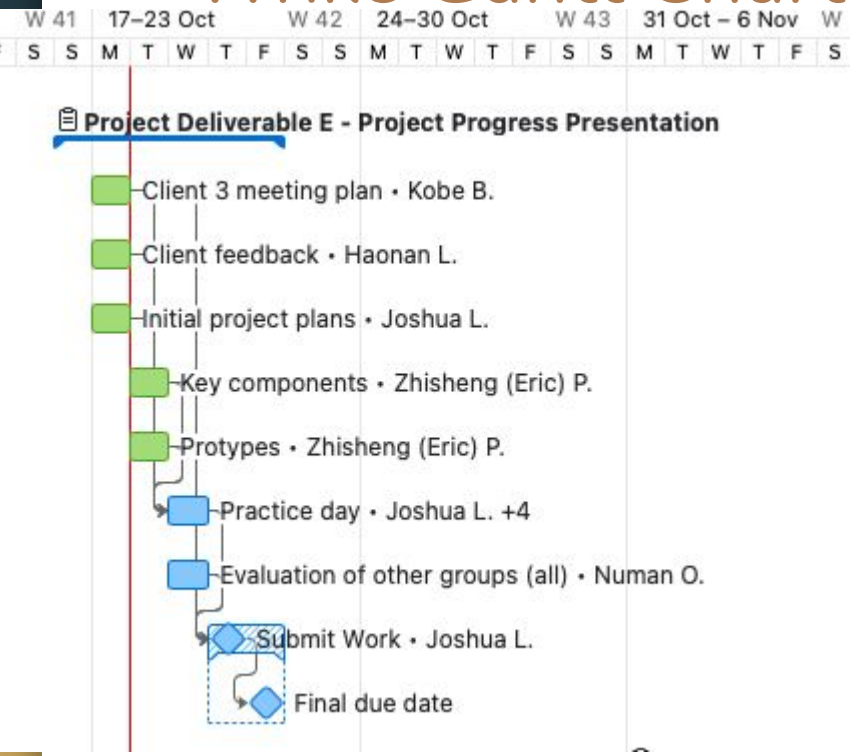
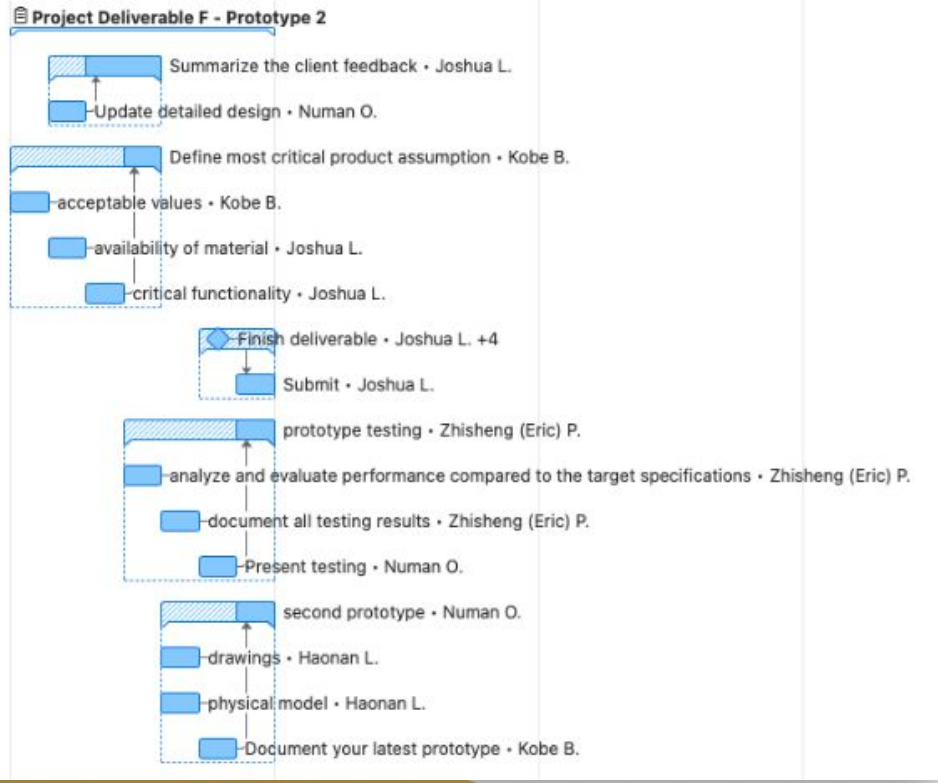
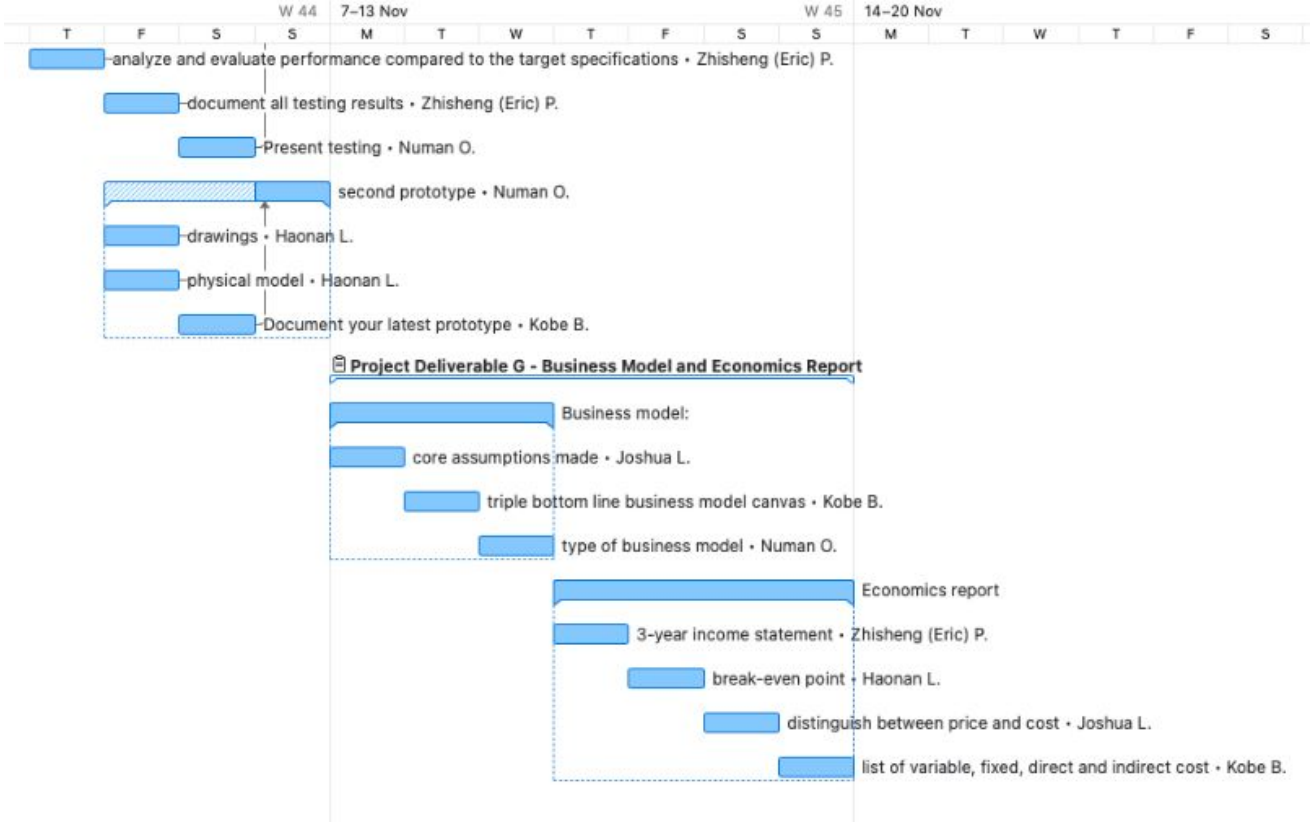
Client meeting 3 plan

- Show the client our frame to visualize approximately how it will look
- Explain how it will be finished
- Answer any questions they have for us
- Adjust prototype if they have any concerns

Wrike Gantt Chart






W 44
7–13 Nov
W 45
14–20 Nov
T F S S M T W T F S S M T W T F S
analyze and evaluate performance compared to the target specifications • Zhisheng (Eric) P.
document all testing results • Zhisheng (Eric) P.
Present testing • Numan O.
second prototype • Numan O.
drawings • Haonan L.
physical model • Haonan L.
Document your latest prototype • Kobe B.
Project Deliverable G - Business Model and Economics Report
Business model:
core assumptions made • Joshua L.
triple bottom line business model canvas • Kobe B.
type of business model • Numan O.
Economics report
3-year income statement • Zhisheng (Eric) P.
break-even point • Haonan L.
distinguish between price and cost • Joshua L.
list of variable, fixed, direct and indirect cost • Kobe B.

Questions?