

Group: 10

Project Title: TrailRider 5.0

Last Week's Goals:

1. To discuss team goals, expectations, strengths and weakness and to distribute tasks accordingly.
2. To work through an iteration of the design process from developing needs statements to function decomposition.
3. To identify our target market with justification.

Last Week's Activities:

Name	Activities	Hours Worked	
		Last Week	Total
Andrea	<ul style="list-style-type: none">● Researched search and rescue regulations and compatibility● Researched potential target markets, client needs● Report template	8	9
Carson	<ul style="list-style-type: none">● Researched alternative products to the TrailRider, including the Joelette.● Collaborated on target specifications with the team● Started this weekly report	8	10
Julia	<ul style="list-style-type: none">● Updated Gantt Chart progress each meeting● Researched biomechanics and wheelchair properties● Determined constraints and needs sacrifices	8	10
Lukas	<ul style="list-style-type: none">● Researched comparable products and solutions● Generated a summary of the target market	8	9
Ratthamnoon	<ul style="list-style-type: none">● Researched Canadian disability statistics● Worked on target specifications, target market, and needs & stakeholder, and project scope● Finished this weekly report	8	9
Stephen	<ul style="list-style-type: none">● Gantt chart● Function decomposition● Researched needs and stakeholders	8	9

Summary of progress:

- Preliminary research has been conducted on several alternatives to the TrailRider such as the Joelette, the GRIT and the Freewheel
- A preliminary set of target specifications has been developed
- A preliminary target market has been established as paraplegics who would like more independence than offered by the TrailRider when exploring urban, class one terrain

Assessment of Overall Progress:































- Most of the tasks that needs to be finished this week is finished, and the rest need minor revisions to finish and not critical for starting next week's tasks.
- Some team members may do more task wrap up than others, but the team as a whole is on track to complete the project on time.

Goals for Next Week:

1. Conclude and document research on the current TrailRider design (complete 'Investigation' appendix)
2. Conclude and document research on other products on the market (complete 'Literature Research' appendix)
3. Begin generating concepts for each function that has been identified

Action Items for Next Week:

Name	Action(s)	Due Date(s)
Andrea	Revise needs assessment	9/16
Carson	Summarize current wheelchair specifications	9/16
Julia	Summarize BCMOS (Investigation Appendix)	9/16
Lukas	Summarize existing designs (Literature Appendix)	9/16
Ratthamnoon	Determine overall project scope	9/16
Stephen	Revise needs assessment	9/16
All	Function Decomposition	9/16
All	Concept generation process (C-sketch rounds, concept combination)	9/20
All	DFMEA 1	9/20

ID		Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names				Sep 1, '19							
									T	F	S	S	M	T	W	T	F		
1			Needs Assessment	1 day	Fri 9/06/19	Fri 9/06/19			<div></div>										<div></div>
2			Research BCMOS background and their need statements. Clarify in Q&A section.	5 days	Mon 9/09/19	Fri 9/13/19													
3			Research current wheelchair specifications	5 days	Mon 9/09/19	Fri 9/13/19													
4			Research available markets	5 days	Mon 9/09/19	Fri 9/13/19													
5			Research other products	5 days	Mon 9/09/19	Fri 9/13/19													
6			Choose our market stakeholders and determine needs	5 days	Mon 9/09/19	Fri 9/13/19													
7			Create preliminary target specifications	5 days	Mon 9/09/19	Fri 9/13/19													
8			Determine project constraints	5 days	Mon 9/09/19	Fri 9/13/19													
9			Determine overall project scope	5 days	Mon 9/09/19	Fri 9/13/19													
10			Concept Generation	1 day	Fri 9/06/19	Fri 9/06/19													<div></div>
11			Function decomposition	2 days	Fri 9/13/19	Mon 9/16/19													
12			C-sketch round 1	1 day	Mon 9/16/19	Mon 9/16/19	2;3;4;7;8;9												
13			First set of concept combination	1 day	Wed 9/18/19	Wed 9/18/19	12												
14			C-sketch round 2	1 day	Wed 9/18/19	Wed 9/18/19	12												
15			Concept combination (complete concepts)	1 day	Fri 9/20/19	Fri 9/20/19	14												
16			DFMEA 1	1 day	Fri 9/20/19	Fri 9/20/19													
17			Concept Evaluation	1 day	Fri 9/06/19	Fri 9/06/19													<div></div>
18			Winnowing	1 day	Mon 9/23/19	Mon 9/23/19													
19			Ranking - Pugh Chart	1 day	Mon 9/23/19	Mon 9/23/19													
20			Scoring - WDM	1 day	Wed 9/25/19	Wed 9/25/19	19;18												
21			Optimization	2 days	Fri 9/27/19	Mon 9/30/19	20												
22			DFMEA 2	3 days	Mon 9/30/19	Wed 10/02/19													
23			Concept selection presentation	6 days	Wed 10/02/19	Wed 10/09/19													
24			Design	1 day	Fri 9/06/19	Fri 9/06/19													<div></div>

Project: Gantt Chart


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Task


Split


Milestone

Summary











Project Summary


External Tasks


External Milestone

Inactive Task











Inactive Milestone


Inactive Summary


Manual Task

Duration-only











Summary Rollup


Manual Summary


Start-only

Finish-only










Progress

Deadline



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ID		Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names				Sep 1, '19						
									T	F	S	S	M	T	W	T	F	
25			First set of iterations (of final concept)	1 day	Fri 10/11/19	Fri 10/11/19												
26			Calculations & stress analysis	5 days	Mon 10/14/19	Fri 10/18/19												
27			Preliminary costing & LCA	5 days	Mon 10/14/19	Fri 10/18/19												
28			Second set of iterations	5 days	Mon 10/21/19	Fri 10/25/19												
29			Secondary costing & LCA	5 days	Mon 10/21/19	Fri 10/25/19												
30			DFMEA 3	3 days	Wed 10/23/19	Fri 10/25/19												
31			Complete detailed CAD of key components	5 days	Mon 10/21/19	Fri 10/25/19												
32			Closeout	1 day	Fri 9/06/19	Fri 9/06/19												
33			Report mock deadline	21 days	Fri 10/11/19	Fri 11/08/19												
34			Report actual deadline	26 days	Fri 10/11/19	Fri 11/15/19												
35			Presentation mock deadline	6 days	Fri 11/08/19	Fri 11/15/19												
36			Presentation actual deadline	9 days	Fri 11/08/19	Wed 11/20/19												
37			Logbook submission	2 days	Thu 11/28/19	Fri 11/29/19												
38			Choose our market stakeholders and determine needs	1 day	Fri 9/06/19	Fri 9/06/19												



Project: Gantt Chart


Date: 9/13/2019 4:15 PM


Task


Split


Milestone

Summary











Project Summary


External Tasks


External Milestone

Inactive Task











Inactive Milestone


Inactive Summary


Manual Task

Duration-only











Summary Rollup


Manual Summary


Start-only

Finish-only











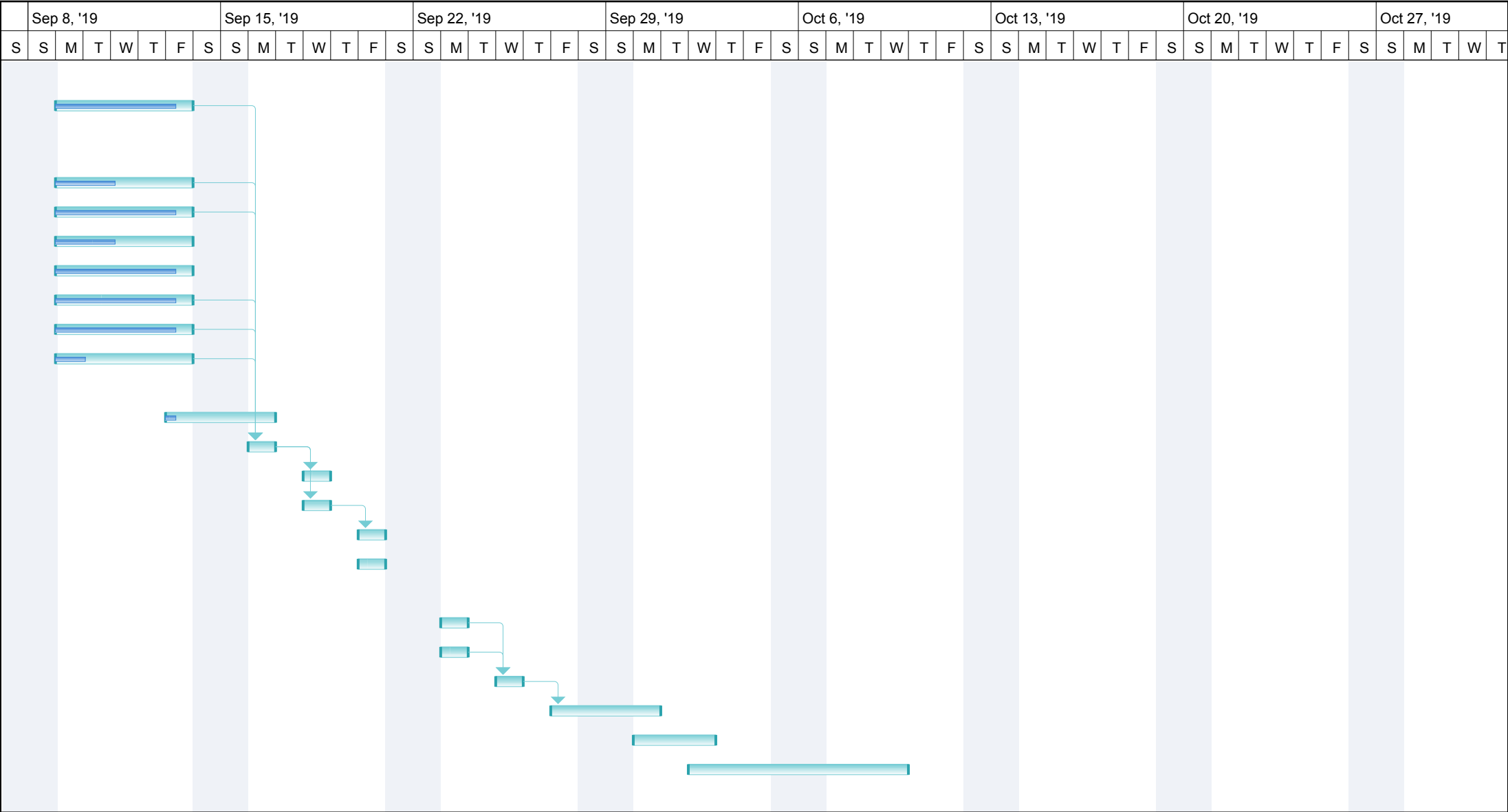
Progress

Deadline





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Project: Gantt Chart
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| Task | | Project Summary | | Inactive Milestone | | Summary Rollup | | Progress | | Deadline |
| Split | | External Tasks | | Inactive Summary | | Manual Summary | | Start-only | | Finish-only |
| Milestone | | External Milestone | | Manual Task | | Duration-only | | Task | | Task |
| Summary | | Inactive Task | | Task | | Task | | Task | | Task |

Target Design Specifications									
Notes: e.g. level of influence on project	Needs				Requirements				
	Needs Category	Need as expressed	Explanatory Notes	Need Statement		Metric	Acceptable Threshold		Justification
					Entity to be measured	Units	Minimum	Maximum	Y/N
	Safety	"Make it safer"	Safety is a priority for the person with disabilities, or else they will not use the device.	The device must be safer than the current design.	Rider can be left unattended (unit does not tip), unit is stable on moderate lateral slopes up to 15 degrees	2 points for being unattended, 1 more for each 5 degrees of lateral slope withstandable before requiring intervention	0	5	A main safety concern of trail rider is tipping, so using tipping as the main safety metric is acceptable. The basic ideas of the score are from the quality of what makes a tip. While score numbers are somewhat arbitrary, they can be changed later on.
	Ergonomics	"Make it smaller"	A more compact device is more likely to be bought and used more frequently.	The device must be smaller than the current design.	Percent improvement summation of turning radius and width	%	0	100	Main ergonomic component in a trail is how easy it is to navigate turns. Current TrailRider serves as a good benchmark.
	Durability	"Make it stronger"	A device must be able to withstand heavy people and impacts (such as falling)	The device must be stronger than the current design.	Device has expected service life of minimum 10 years, minimal service required, no major service expected during that period	Subjective scoring to be refined during later stages	0	100	A good measure of durability is how much it needs to be serviced. Once we generated concepts, we would have a better idea on identifying weak points, or we can have something for an expert to look at and help us evaluate.
	Weight	"Make it lighter"	A lightweight device will create less human fatigue for the Sherpas and the rider.	The device must be lighter than the current design.	Percent weight savings compared to previous model	kg	0	23	Current Trail Rider is 23 kg. We use that as maximum acceptable threshold, and any improvements to it is better.
	Portability	"Improve the device's portability"	A more portable device will be used more often,	The device must be easy to transport.	Folded volume	m^3	0	0.86	Current TrailRider's folded volume is 172 cm x 82 cm x 61 cm = 0.860344 m^3. Assume that folded geometries are standard (ex: no infinitely thin cylinder). We used volume instead of vehicle class because many disabled people rely on public transport, which has more variation and does not have clearly defined vehicle classes. We can also define a cap for a specific dimension need later if needed (ex: to fit an ambulance, to fit common cars, etc).
	Cost	"Reduce production cost"	A cheaper device will be more accessible to people in the market.	The device must have a lower production cost.	Delivered cost to user (eligible for tax credit)	CAD	0	\$9,000	Average annual disposable income of disable people is approximately \$9000. While the current \$7500 is not the worst, it can be improved.
	Interaction	"More rider interaction"	A person with disabilities seeks independence and will be more happy to do most of the work themselves.	The rider must have more independence in using the device.	Provides adjustment and involvement in the form of breaks, reclining seat, etc.	Number of meaningfully adjustable parameters	0	4	The more adjustable the seat is, the more interactive the trail rider can feel. We arbitrarily cap it at 4, but if there's a design that has more adjustable parameters, we can modify this later on.
	Robust	"Improve the device's ability to withstand exposure to water and dirt"	A device that is robust in all weather conditions will be used with more trails and seasons.	The device must remain in quality shape after long exposure to wet and dirty conditions.	Resistance to rust, number of moving parts requiring service	Subjective scoring	0	4	Once we generate concepts, we'll have a better idea of how to quantify parts resistance.
	Usage	"Make the device usable by a single "Sherpa" "	The need for only a single Sherpa is desirable because it is easier to schedule hikes with less people.	The device must be able to be used by a single Sherpa.	Number of helpers required	one (3), two (2), three or more (1)	1	3	Current TrailRider uses 2 people, so 1 worse would be maximum, and symmetrically 1 better would be minimum.
	Regulatory	"Make the device Search And Rescue compatible"	Also important to safety, in the case of emergencies the hikers must be found and carried quickly.	The device must be easily accessible by Search and Rescue members.	Device fits within standard ambulance and elevator dimensions	Fits planform (topview) dimensions 2010 mm x 610 mm		Fits planform or not	The size is standard for emergency rescue planform in Canada.