Development Plan
Baja Dynamics

Team #17, Team Name
Grace McKenna
Travis Wing
Cameron Dunn
Kai Arseneau

Table 1: Revision History

Date	**Developer(s)**	**Change**
Date1	Name(s)	Description of changes
Date2	Name(s)	Description of changes
...	...	...

[Put your introductory blurb here. Often the blurb is a brief roadmap of what is contained in the report. —SS]

[Additional information on the development plan can be found in the lecture slides. —SS]

1 Confidential Information?

[State whether your project has confidential information from industry, or not. If there is confidential information, point to the agreement you have in place. —SS]

[For most teams this section will just state that there is no confidential information to protect. —SS]

2 IP to Protect

[State whether there is IP to protect. If there is, point to the agreement. All students who are working on a project that requires an IP agreement are also required to sign the "Intellectual Property Guide Acknowledgement." —SS]

We do not have any IP to protect.

3 Copyright License

[What copyright license is your team adopting. Point to the license in your repo. —SS]

4 Team Meeting Plan

The team will meet in person on Mondays between 2:30-4:30pm on a weekly basis. Additionally, the team will plan to meet virtually or in person as the team sees fit on Fridays at 1:30-2:30pm. Additional meetings may be scheduled as needed, based on the current status of the team's progress towards upcoming course deadlines. All meetings held will have corresponding GitHub issue templates that are to be filled out by the meeting chair. The issues will serve as documentation of the meeting and contain the meeting agenda. The role of the meeting chair will rotate depending on the content being covered during the meeting. The default role of meeting chair will be designated to Cameron Dunn.

[How often will you meet with your industry advisor? when? where? —SS]

[Will meetings be virtual? At least some meetings should likely be in-person. —SS]

5 Team Communication Plan

The team will use a structured Discord server with specific channels to organize conversations and content. This discord server has structured channels seperating scheduling, resources, meetings and general questions and communication. Additionally, the team will communicate through the use of GitHub issues and commits. The team will use specific labels to improve the communication of GitHub issues, for example using labels to seperate backend and frontend issues.

6 Team Member Roles

Grace McKenna

- Notetaker

Travis Wing

- GitHub issue manager

Cameron Dunn

- Meeting chair

Kai Arseneau

- GitHub Reviewer

Although some roles are listed above, the team will plan to rotate larger roles throughout the project to ensure all team members have an equal role in the project. Additionally, this will ensure all team members have knowledge about all parts of the project.

7 Workflow Plan

Main branch - releases + mandatory 3 code reviews (everybody) Develop branch - development + mandatory 1 review Feature branches - individual features being added to develop

CI or linting and automatic testing once implemented CD doesnt really make sense since we are making a local application and doesn't really apply to our stakeholders

Make our own code template for bug report, new features, etc. Same for PRs Ticket types: Bug, New feature, Refactor, Documentation, Testing Backend, frontend, testing

In cases where teammates collaborate on an issue or document, the team will use co-authored commits in GitHub

integration tests on full features, then run on each PR for regression testing

- How will you be using git, including branches, pull request, etc.?
- How will you be managing issues, including template issues, issue classification, etc.?
- Use of CI/CD

8 Project Decomposition and Scheduling

8.1 Project Schedule

Team Formed, Project Selected	September 16
Problem Statement, POC Plan, Development Plan	September 24
Requirements Document Revision 0	October 9
Hazard Analysis 0	October 23
V&V Plan Revision 0	November 1
Proof of Concept Demonstration	November 11–22
Design Document Revision 0	January 15
Revision 0 Demonstration	February 3–February 14
V&V Report Revision 0	March 7
Final Demonstration (Revision 1)	March 24–March 30
EXPO Demonstration	April TBD
Final Documentation (Revision 1)	April 2
- Problem Statement	
- Development Plan	
- Proof of Concept (POC) Plan	
- Requirements Document	
- Hazard Analysis	
- Design Document	
- V&V Plan	
- V&V Report	
- User's Guide	
- Source Code	

8.2 GitHub Projects

The team will be using a GitHub project titled CVT Simulator Planner. This project will track items based current existing items to be assigned, items that are in progress and completed items. Each item is intended to have a description and once in progress the name of the team member/members who will be working on the item. The goal of this GitHub project is to ensure all team members are on the same page regarding what needs to be started for upcoming project deliverables and project features. Team members are also able to see which items are in progress which will help communicate what team memebrs

are actively working on. This will increase communication between team members as all members are able to see what each other are currently working on. This project also has a section to show the items that have been completed.

GitHub Project Link: https://github.com/users/gr812b/projects/1

- How will you be using GitHub projects?
- Include a link to your GitHub project

[How will the project be scheduled? This is the big picture schedule, not details. You will need to reproduce information that is in the course outline for deadlines. —SS]

9 Proof of Concept Demonstration Plan

The main risks include not being able to validate our simulation, not being able to successfully reflect real world factors such as friction and having limitations due to the level of the mathematics our team is able to simulate. During our proof of concept demonstration our team will demonstrate the mathematics and compare our calculations to existing data that is available to our team through McMaster's Baja team. Our proof of concept will aim to simulate the math behind our team's project.

What is the main risk, or risks, for the success of your project? What will you demonstrate during your proof of concept demonstration to convince yourself that you will be able to overcome this risk?

10 Expected Technology

[What external libraries? —SS]

- Python
- C#
- Framework: Unity
- Unity test framework
- Math
- Version Control: git
- GitHub
- GitHub Projects
- 3D model - CAD
- Microsoft Excel

- VS Code
- The Data Viewer - pre-existing website to graph and view data, designed by McMaster's Baja Racing Team.
- Linter tool: Flake8
- Specific unit testing framework
- Investigation of code coverage measuring tools

11 Coding Standard

The team will adhere to Google Python style guide in order to help format code correctly.

Appendix — Reflection

The purpose of reflection questions is to give you a chance to assess your own learning and that of your group as a whole, and to find ways to improve in the future. Reflection is an important part of the learning process. Reflection is also an essential component of a successful software development process.

Reflections are most interesting and useful when they're honest, even if the stories they tell are imperfect. You will be marked based on your depth of thought and analysis, and not based on the content of the reflections themselves. Thus, for full marks we encourage you to answer openly and honestly and to avoid simply writing "what you think the evaluator wants to hear."

Please answer the following questions. Some questions can be answered on the team level, but where appropriate, each team member should write their own response:

1. Why is it important to create a development plan prior to starting the project?

   It is important to create a development plan prior to the start of large team projects, as it helps set the tone for the project, organize and breaks it down into smaller tasks and outlines individual responsibilities. The development plan also highlights key deadlines and identifies potential risks, ensuring that mitigation strategies are disciussed in advance. Additionlly, a development plan aids in the success of team communication by specifying the frequency of meetings, methods of communication, and other measures to enhance collaboration. Ultimately, a development plan acts as a roadmap that keeps the team on track throughout deliverables, supports effetive problem solving, and supports risk management.

2. In your opinion, what are the advantages and disadvantages of using CI/CD?

   The advantages of using CI/CD are for large projects where the needs of the users are constantly changing because they makes it easier to test and deploy code quickly and efficiently. CI helps to automate testing and integration, while CD helps to automate the deployment of code. This helps on large projects where the can be many systems interacting with eachother in complex and unpredictable ways. On the other side, the disadvantages are more felt on smaller projects where the needs of the users are more static. In these cases, the overhead of CI/CD slows down development more than it helps. Additionally since these projects are smaller, it is less helpful due to the system being more predictable.

3. What disagreements did your group have in this deliverable, if any, and how did you resolve them?

   There were disagreements regarding the scope of the project and the level of detail that should be included in the development plan. Some team members had concerned about the level of difficultly of the project and if

we would be able to complete it. On the other hand, other team members felt that we were capable of completing the project and needed to add more details for the deliverable. We resolved these issues by meeting as a team and doing a walkthrough of the entire project and its components. This helped the concerned team members understand the project better and made it feel more attainable. This walkthrough ended up serving as the basis for the development plan.

Appendix — Team Charter

[borrows from University of Portland Team Charter —SS]

External Goals

[What are your team's external goals for this project? These are not the goals related to the functionality or quality of the project. These are the goals on what the team wishes to achieve with the project. Potential goals are to win a prize at the Capstone EXPO, or to have something to talk about in interviews, or to get an A+, etc. —SS]

Attendance

Expectations

All team members are to communicate regarding their attendance of team meetings. If a team member is unable to attend a meeting, the meeting will either be rescheduled, depending on the importance of the content being covered in the meeting, or the team member will be debriefed by another team member. Team members are expected to communicate with one another if they will be late or need to leave the team meeting early.

Acceptable Excuse

[What constitutes an acceptable excuse for missing a meeting or a deadline? What types of excuses will not be considered acceptable? —SS]

Acceptable excuses for missing a meeting or deadline without prior notice include:

- Sudden illness or injury requiring medical attention
- Family emergency needing immediate attention
- Unexpected technical difficultlies
- Other extreme unfourseen circumstances

With prior notice (>24 hours before), it is acceptable to miss a meeting for any scheduled event or obligation that cannot be rescheduled such as:

- Medical appointments
- Planned family events or support
- Academic obligations (exams, projects, presentations, etc.)
- Other scheduled events

It is unacceptable to miss a meeting or deadline outside of the above circumstances.

In Case of Emergency

[What process will team members follow if they have an emergency and cannot attend a team meeting or complete their individual work promised for a team deliverable? —SS]

In a case of emergency where a team member cannot deiver on their responsibilities, the team will handle resdistributing that work. In the case of a meeting, one or more team members will assume the responsibilities of the missing team member and will debrief them afterwards. In the case of a deliverable, the team will redistribute what cannot be completed by the missing team member to the rest of the team.

Accountability and Teamwork

Quality

The process for addressing teammates who do not meet expectations will be as follows. The team will meet with the individual who did not meet the expectations and address why the expectations have not been met yet. The team member will be given an additional day to complete the work if this is time permitted. The penalty for this unmet expectation will be for future deliverables the individual must take on a bigger chunk of the work to make up for the missed work on the current deliverable.

[What are your team's expectations regarding the quality of team members' preparation for team meetings and the quality of the deliverables that members bring to the team? —SS]

Attitude

Team members will always treat one another with respect and have a positive attitude towards one another.

[What are your team's expectations regarding team members' ideas, interactions with the team, cooperation, attitudes, and anything else regarding team member contributions? Do you want to introduce a code of conduct? Do you want a conflict resolution plan? Can adopt existing codes of conduct. —SS]

Stay on Track

[What methods will be used to keep the team on track? How will your team ensure that members contribute as expected to the team and that the team performs as expected? How will your team reward members who do well and manage members whose performance is below expectations? What are the consequences for someone not contributing their fair share? —SS]

[You may wish to use the project management metrics collected for the TA and instructor for this. —SS]

[You can set target metrics for attendance, commits, etc. What are the consequences if someone doesn't hit their targets? Do they need to bring the

coffee to the next team meeting? Does the team need to make an appointment with their TA, or the instructor? Are there incentives for reaching targets early? —SS]

Team meetings as well as the GitHub project board, issues and commit history will be used to monitor each team member's progress. At each meeting, the team will discuss the progress of each member and evaulte if they are on track to meet the project deadlines. If a team member is found to not be meeting their expectations, the team will discuss what can be done to get them back on track in the regular meeting. If the issue continues, a special meeting will be scheduled to understand that member's problems and how to resolve them. If after this the issues still persist then the team will meet with a TA or the professor to address the team member's failure to meet their responsibilities.

To incentivize performance, control over decision making of team celebration will be given proportionally to the quality and timeliness of work completed by each team member.

The metrics used to measure a team performance will be their attendance at meetings, the subjective quality of their work and how well they are able to meet deadlines. Other quantitivate metrics such as commits and lines of code will only be used to supplmement the above metrics or in extreme cases such as having no commits or lines of code.

Team Building

[How will you build team cohesion (fun time, group rituals, etc.)? —SS]

The team will celebrate their accomplishments through team dinners or other social events.

Decision Making

[How will you make decisions in your group? Consensus? Vote? How will you handle disagreements? —SS]

When there are disagreements, the team will meet to discuss the issue until an absolute majority (>50%) of the team agrees on a solution.