*Train Simulation*

Use Case Specification Document

**Case Id 7**

**Track Simulation**

Version No. 2.0.0

Project Document Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **VersionNumber** | **Date** | **Revision Author** | **Description of Revision** |
| 1.0.0 | 3/12/19 | Maxx Achtman | Maxx Achtman completed:  1.) Introduction  2.) Use Case Information  3.) Trigger  4.) Preconditions  5.) Postconditions  6.) Use Case Swimlane (Activity) Diagram  7.) Main/Basic Flow(s) of Events (Happy Path)  8.) Alternate/Exception Flow of Events  9.) Assumptions/Business Rules including Non-Functional Requirements |
| 2.0.0 | 4/17/19 | Zaid Alsafi | Removing assumptions and things that we might not be able to do. |

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# 1. Introduction

Tracking Statistics is what would be used in order for data could be created.  This would include the amount of time a train is used, the amount of travel done throughout the day, total costs, etc.  With this information, it would allow the user to analyze the data in a visual perspective. Through this idea, updates can then be created in a logical way that would benefit companies that wish to use our system with positive results.

# 2. Use Case Information

## 2.1 Actors

|  |  |  |
| --- | --- | --- |
| Actor Name | Role | Description |
| File Generator | Main | Create data in separate file that would continuously update during simulation run |
| Simulation System | Secondary | Run simulation with files that are read prior to start of simulation |

## 

## 2.2 Use Case Interaction

A list of predecessors use cases are as follows:

Use Case 1 – Setup initial state: Read through files provided by the user and verify data entered is valid that will be used to track a simulation run

Use Case 2 – Add / Remove Trains: After the initial setup is ran, user would be able to manually edit trains by adding and removing trains. Reflections made would be shown while tracking data during simulation run

Use Case 3 – Edit Railway: After initial setup is ran, user would be able to manually edit railway by adding and removing tracks, hubs, and stations. Reflections made would be shown while tracking data during simulation run

Use Case 4 – Adjust Weather: After initial setup is ran and processed, the user can adjust the type of weather and severity. This will be updated in the simulation system to cover for weather pattern scenarios

Use Case 5 – Update Graph: Graph will be created from reading files and user changes. Tracking statistics will be able to recognize what values to store according to graph placement

Use Case 6 – Run Simulation: Once all changes are made and graph is updated according to initial Files and user changes the graph will simulate what is occurring and tracking statistics will be ran behind the scenes.

A list of successors use cases are as follows:

Use Case 8 – Recommend Changes: Once simulation has ran, user would be shown what changes would improve the total timing of the current simulation run that the graph has produced

Use Case 9- View Statistics: User will be able to view the data from a simulation run in a file that is created from the Track Statistics Use case

Use Case 10 – Rollback Simulation History: User will be able to view any prior simulation from the file that was generated on that given simulation run from Track Statistics Use Case.

# 3. Trigger

Simulation must be running for this Use Case to initiate

# 4. Pre-condition(s)

1. Run Simulation
2. File exists to record data

# 5. Post-condition(s)

1. Return to user with valid data from simulation run in a separate file
2. View Statistics

# 6. Use Case Swimlane (Activity) Diagram

## 

# 7. Main/Basic Flow(s) of Events (Happy Path)

1. Create a separate row for each train number
2. Reference distance traveled associated with each train
3. Reference each stop a specific train made during the simulation run
4. Provide break times initiated for each train to ensure employees are taking breaks
5. Provide start of day time for each train
6. Provide end of day time for each train
7. For freight trains only, provide cost of travel for each simulation run

# 8. Alternate/Exception Flow of Events

1. N/A

# 9. Assumptions/Business Rules including Non-Functional Requirements

1. Files will be placed in designated location
2. File memory will not be greater than 1 GB