**Master Test Plan (MTP) for MBO**

**Overview**

Tests for the MBO will be organized by class. The classes to be tested are the Scheduler, Drivers, SMBA, and TrackLayout classes. Testing will be performed periodically during development.

**Scheduler Tests**

* Generating/Exporting a Schedule
  + **Correct driver and throughput prerequisites**
    - Input: throughput and list of drivers
    - Expected Output: A comma delimited list of train movement information
  + **Correct driver but unattainable throughput prerequisites**
    - Input: throughput and list of drivers
    - Expected Output: A comma delimited list of train movement information with warning message that throughput is not reached
  + **Incorrect driver prerequisites**
    - Input: throughput and list of drivers
    - Expected Output: An error message detailing why the available drivers cannot cover a schedule
  + **Setting Throughput**
    - Input: List of throughputs for each hour of the day
    - Expected Output: Throughput set internally
  + **Setting Start of Day**
    - Input: hour of the day that the schedule will start
    - Expected Output: Start of Day set internally
  + **Exporting Schedule**
    - Input: Press the export button when a schedule has been generated
    - Expected Output: schedule.csv is created and contains the generated schedule

**Drivers Tests**

* Manage Drivers
  + **Hire Driver**
    - Input: Driver name and shift
    - Expected Output: Driver name and shift displayed to UI in order of shift start time
  + **Fire Driver**
    - Input: Driver name
    - Expected Output: Driver entry removed from UI

**SMBA Tests**

* Calculate Authority
  + **Errorless coordinates**
    - Input: Series of GPS coordinates
    - Expected Output: Calculated authority values for the sending train
  + **Errored coordinates**
    - Input: Series of GPS coordinates with errors
    - Output: Signal directing train to default to fixed block authority when moving block cannot be determined

**TrackLayout Tests**

* Enter Lines
  + **Green Line**
    - Input: file path for greenline\_v2.csv
    - Expected Output: List of linked blocks with coupled occupancies and no segmentation faults occurring
  + **Red Line**
    - Input: file path for redline\_v2.csv
    - Expected Output: List of linked blocks with coupled occupancies and no segmentation faults occurring

**Template for Tests**

* Templates for each test will contain the outcome of the test (Pass or Fail), the specific outcome expected versus what happened, when the test was performed and which user requested it. This data will be given as an output template as seen below formatted in lines of text after a test.

| **Master Test Plan (MTP) for MBO** | | |
| --- | --- | --- |
|  | | |
| **Testing Task and Outcome** | **Input** | **Output** |
| **Generating/Exporting a Schedule:** Correct driver and throughput prerequisites  **Expected Outcome:**   1. A comma delimited list of train movement information | throughput and list of drivers | Display on UI |
| **Outcome of Test** | **Who Performed Test** | **Completed When** |
| Pass | Matthew Meehan | 12/7/2021 |

| **Testing Task and Outcome** | **Input** | **Output** |
| --- | --- | --- |
| **Generating/Exporting a Schedule:** Correct driver but unattainable throughput prerequisites  **Expected Outcome:**   1. A comma delimited list of train movement information with warning message that throughput is not reached | throughput and list of drivers | Display on UI + warning message |
| **Outcome of Test** | **Who Performed Test** | **Completed When** |
| Pass | Matthew Meehan | 12/7/2021 |

| **Testing Task and Outcome** | **Input** | **Output** |
| --- | --- | --- |
| **Generating/Exporting a Schedule:** Incorrect driver prerequisites  **Expected Outcome:**   1. An error message detailing why the available drivers cannot cover a schedule | throughput and list of drivers | Error message |
| **Outcome of Test** | **Who Performed Test** | **Completed When** |
| Pass | Matthew Meehan | 12/7/2021 |

| **Testing Task and Outcome** | **Input** | **Output** |
| --- | --- | --- |
| **Generating/Exporting a Schedule:** Setting Throughput  **Expected Outcome:**   1. Throughput set internally | List of throughputs for each hour of the day | None |
| **Outcome of Test** | **Who Performed Test** | **Completed When** |
| Pass | Matthew Meehan | 12/7/2021 |

| **Testing Task and Outcome** | **Input** | **Output** |
| --- | --- | --- |
| **Generating/Exporting a Schedule:** Setting Start of Day  **Expected Outcome:**   1. Start of Day set internally | hour of the day that the schedule will start | None |
| **Outcome of Test** | **Who Performed Test** | **Completed When** |
| Pass | Matthew Meehan | 12/7/2021 |

| **Testing Task and Outcome** | **Input** | **Output** |
| --- | --- | --- |
| **Generating/Exporting a Schedule:** Exporting Schedule  **Expected Outcome:**   1. schedule.csv is created and contains the generated schedule | Press the export button when a schedule has been generated | .csv containing generated schedule |
| **Outcome of Test** | **Who Performed Test** | **Completed When** |
| Pass | Matthew Meehan | 12/7/2021 |

| **Testing Task and Outcome** | **Input** | **Output** |
| --- | --- | --- |
| **Manage Drivers:** Hire Driver  **Expected Outcome:**   1. Driver name and shift displayed to UI in order of shift start time | Driver name and shift | Display UI |
| **Outcome of Test** | **Who Performed Test** | **Completed When** |
| Pass | Matthew Meehan | 12/7/2021 |

| **Testing Task and Outcome** | **Input** | **Output** |
| --- | --- | --- |
| **Manage Drivers:** Fire Driver  **Expected Outcome:**   1. Driver entry removed from UI | Driver name | Display UI |
| **Outcome of Test** | **Who Performed Test** | **Completed When** |
| Pass | Matthew Meehan | 12/7/2021 |

| **Testing Task and Outcome** | **Input** | **Output** |
| --- | --- | --- |
| **Calculate Authority:** Errorless coordinates  **Expected Outcome:**   1. Calculated authority values for the sending train | Series of GPS coordinates | Authority signal |
| **Outcome of Test** | **Who Performed Test** | **Completed When** |
| Pass | Matthew Meehan | 12/7/2021 |

| **Testing Task and Outcome** | **Input** | **Output** |
| --- | --- | --- |
| **Calculate Authority:** Errored coordinates  **Expected Outcome:**   1. Signal directing train to default to fixed block authority when moving block cannot be determined | Series of GPS coordinates with errors | Authority signal |
| **Outcome of Test** | **Who Performed Test** | **Completed When** |
| Pass | Matthew Meehan | 12/7/2021 |

| **Testing Task and Outcome** | **Input** | **Output** |
| --- | --- | --- |
| **Calculate Authority:** Green Line  **Expected Outcome:**   1. List of linked blocks with coupled occupancies and no segmentation faults occurring | file path for greenline\_v2.csv | List of blocks, no faults |
| **Outcome of Test** | **Who Performed Test** | **Completed When** |
| Pass | Matthew Meehan | 12/7/2021 |

| **Testing Task and Outcome** | **Input** | **Output** |
| --- | --- | --- |
| **Calculate Authority:** Red Line  **Expected Outcome:**   1. List of linked blocks with coupled occupancies and no segmentation faults occurring | file path for redline\_v2.csv | List of blocks, no faults |
| **Outcome of Test** | **Who Performed Test** | **Completed When** |
| Pass | Matthew Meehan | 12/7/2021 |