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| **Use case Name** | Find Location |
| **Trigger** | User Accesses mobile application |
| **Precondition** | User has to be connected to Wi-Fi  GPS has to be activated |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Application determines user location |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location  **In step 4**, if location cannot be determined a message is displayed alerting user that location could not be determined |
| **Post condition** | Users’ current location displayed |

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| **Use case Name** | Update Location |
| **Trigger** | User location changes |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Find location 5. Confirm location 6. As user walks to destination, their current location is updated |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location  **In step 4**, if location cannot be determined a message is displayed alerting user that location could not be determined |
| **Post condition** | User location updates |
| **Exception Paths** | User may abandon path at any time |

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| **Use case Name** | Add Recent Locations |
| **Trigger** | User selects option to add location to favourite locations |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Mobile app has to be open |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Go to Favourites tab 5. Click on add recent location |
| **Alternative Path** | If user does not add new locations, system tracks all locations user has navigated to and adds those locations to the ‘Favourites’ list if it is not already in the list |
| **Post condition** | New recent location added |
| **Exception Paths** | User can abort creation of new recent location at any time |

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| **Use case Name** | Remove Location |
| **Trigger** | User selects delete option from the Favorites tab |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Mobile app has to be open |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Go to ‘Favourites’ tab 5. Click on ‘Delete Recent Location’ |
| **Alternative Path** |  |
| **Post condition** | Recent location is removed from ‘Favourites’ list |

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| **Use case Name** | Time to location |
| **Trigger** | User selects location to navigate to |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Mobile app has to be open  User has to select location to navigate to |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Search for location 5. Confirm location |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location  **In step 4**, if location cannot be found a message is displayed alerting the user that the destination location could not be determined  **In step 5**, if user does not confirm location, estimated time is not displayed |
| **Post condition** | Estimated time to destination displayed on user interface |
| **Exception Paths** | User can abort path at any time |

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| **Use case Name** | Traffic Tracking |
| **Trigger** | User selects location to navigate to |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Mobile app has to be open  User has to select location to navigate to |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Search for location 5. Hotspot information retrieved and displayed on routs 6. User confirms route based on hotspot information |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location  **In step 4**, if location cannot be found a message is displayed alerting the user that the destination location could not be determined  **In step 5**, if hotspot information cannot be retrieved, application displays message alerting user that the hotspot information could not be retrieved and possible routes are shown |
| **Post condition** | Hotspot information displayed to user on all possible routes |
| **Exception Paths** | User may abort location confirmation  User may abort navigation at any time |

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| **Use case Name** | Suggest Location |
| **Trigger** | User enters application |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Mobile app has to be open |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Suggestions for destinations are displayed to the user |
| **Alternative Path** |  |
| **Post condition** | Suggested locations displayed to user |
| **Exception Paths** |  |
| **Other** |  |

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| **Use case Name** | Update path |
| **Trigger** | Better alternate route is calculated while navigating to destination |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Mobile app has to be open  User has to select location to navigate to  User has to confirm destination  User has to be busy navigating to destination |
| **Basic Path** | While navigating the application measured hotspot traffic on route and redirects user if better path is found with less traffic |
| **Alternative Path** | If not better path is found route remains unchanged |
| **Post condition** | Path is updated and user is redirected |
| **Exception Paths** |  |

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| **Use case Name** | Generate Path |
| **Trigger** | User selects destination |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Mobile app has to be open  User has to select location to navigate to |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Search for location 5. Select location |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location  **In step 4**, if location cannot be found a message is displayed alerting the user that the destination location could not be determined |
| **Post condition** | Path is generated between users current location and destination and path is displayed to the user |
| **Exception Paths** | Select location process can be aborted at any time |

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| **Use case Name** | Add Time Table |
| **Trigger** | User selects option to add time table |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Mobile app has to be open |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Select Time Tables tab 5. Select Add Time Table 6. User adds classes to time table |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location |
| **Post condition** | User adds time table and user interface is updated |
| **Exception Paths** | User can abort the add time table process at any time  User can abort add class process at any time |

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| **Use case Name** | Remove Time Table |
| **Trigger** | User selects option to remove time table |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Mobile app has to be open  A Time Table has to exist |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Select Time Tables tab 5. Select Remove Time Table 6. User removes Time Table |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location  **In step 5**, if there are no Time Tables a message will notify user that no Time Tables exist |
| **Post condition** | Time Table is removed and user interface is updated |
| **Exception Paths** | User can abort the remove time table process at any time |

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| **Use case Name** | Search Location |
| **Trigger** | User selects option to search for a location |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Mobile app has to be open |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Select Search Location tab 5. User selects location |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location  **In step 5**, if location does not exist user will be notified that their currently selected location does not exist |
| **Post condition** | User selected location to navigate to, path to location from the users current location is calculated |
| **Exception Paths** | User can abort the search for a location at any time |

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| **Use case Name** | Real Time Traffic Monitor |
| **Trigger** | User navigates to location |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Mobile Application has to be open  User selected location to navigate to  User is navigating to destination |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Find location 5. Confirm location 6. As user walks to destination, traffic at each hotspot on route is calculated and adjusted if better route with less traffic is calculated by application |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location  **In step 6**, if traffic cannot be calculated application should provide a static route to destination until path can be updated |
| **Post condition** | Path to destination is calculated dynamically to provide path with least amount of traffic |
| **Exception Paths** | User may abandon path at any time |

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| **Use case Name** | Update Location |
| **Trigger** | User location changes |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Find location 5. Confirm location 6. As user walks to destination, their current location is updated |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location  **In step 4**, if location cannot be determined a message is displayed alerting user that location could not be determined |
| **Post condition** | User location updates |
| **Exception Paths** | User may abandon path at any time |

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| **Use case Name** | Voice Input for location |
| **Trigger** | User select option to input location by means of voice recognition |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  App has to be open |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Select “Say Destination Name” button 5. User says the name of destination 6. Destination location is retrieved |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location  **In step 5**, if user says location name and no results are found, a message displaying an error will alert user to try again |
| **Post condition** | User destination selected |
| **Exception Paths** |  |

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| **Use case Name** | Voice Confirmation of Location |
| **Trigger** | User selects destination by means of voice recognition |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Application has to be open  User selected destination by using voice recognition |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Select “Say Destination Name” button 5. User says the name of destination 6. Destination location is retrieved 7. Application responds by confirming name of destination |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location  **In step 7** if user says location name and no results are found, a message displaying an error will alert user to try again |
| **Post condition** | User destination selected |
| **Exception Paths** |  |

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| **Use case Name** | Visual Representation of path |
| **Trigger** | User confirms location |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Mobile Application has to be open  User selected location to navigate to  User has confirmed destination |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Find location 5. Confirm location 6. Application calculates path to destination 7. Path is displayed on graph to indicate which route the user will follow to destination |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location  **In step 4**, if location cannot be determined a message is displayed alerting user that location could not be determined |
| **Post condition** | Path to destination visually represented to user |
| **Exception Paths** | User may abandon path at any time |

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| **Use case Name** | Find Class In Building |
| **Trigger** | User enters building |
| **Precondition** | User has to be connected to the Wi-Fi network  GPS has to activated on the device  Mobile Application has to be open  User selected location to navigate to  User has confirmed destination  User is navigating to building  User enters building |
| **Basic Path** | 1. Connect to Wi-Fi network 2. Activate GPS 3. Open mobile app 4. Find location 5. Confirm location 6. Application calculates path to destination 7. User navigates to destination 8. When user enters destination building, Bluetooth beacons are used to calculate floor of user well as exact location and floor of destination and calculates path to class |
| **Alternative Path** | **In step 1**, if the user cannot connect to a Wi-Fi network, GPS must be used to determine location  **In step 2**, if satellite is down or GPS cannot obtain location, Wi-Fi triangulation is used to determine user location  **In step 4**, if location cannot be determined a message is displayed alerting user that location could not be determined |
| **Post condition** | Path to destination in building displayed to user |
| **Exception Paths** | User may abandon path at any time |