

test plan

First Version



Bilger yahov

oLEKSANDR SUPRUNENKO

ILIA NIKUSHEV

GEORGI CHISHIRKOV

LYUBOMIR DIMOV

MENGCHUAN LIU

Traffic Lights System

Table of Contents

[1. Introduction 1](#_Toc445413367)

[1.1. Purpose 1](#_Toc445413368)

[1.2. Project Overview 1](#_Toc445413369)

[2. Test Strategy 1](#_Toc445413370)

[2.1. Test objectives 1](#_Toc445413371)

[2.2. Test Principles 1](#_Toc445413372)

[2.3. Functional Test 1](#_Toc445413373)

[2.3.1. Select a crossing to place 1](#_Toc445413374)

[2.3.2. Place a crossing 2](#_Toc445413375)

[2.3.3. Remove a crossing 2](#_Toc445413376)

[2.3.4. Create a simulation 2](#_Toc445413377)

[2.3.5. Save a simulation 2](#_Toc445413378)

[2.3.6. Load a simulation 3](#_Toc445413379)

[2.3.7. Edit a road traffic flow 3](#_Toc445413380)

[2.3.8. Start a simulation 3](#_Toc445413381)

[2.3.9. Stop a simulation 3](#_Toc445413382)

[2.3.10. Pause a simulation 3](#_Toc445413383)

[2.3.11. Restart a simulation 4](#_Toc445413384)

[2.3.12. Undo an action 4](#_Toc445413385)

[2.3.13. Redo an action 4](#_Toc445413386)

[2.3.14. Save simulation results 4](#_Toc445413387)

[2.3.15. Show the help window 5](#_Toc445413388)

[2.3.16. Exit application 5](#_Toc445413389)

[2.3.17. Override simulation (Add police, ambulance, firetruck cars). 5](#_Toc445413390)

[2.3.18. Relocate crossing 6](#_Toc445413391)

[2.3.19. Startup the application 6](#_Toc445413392)

[2.3.20. Show simulation result 6](#_Toc445413393)

[2.3.21. Select crossing’s component to make changes 7](#_Toc445413394)

[2.4.22. Set current active crossing 7](#_Toc445413420)

[2.4.23. Edit a crosswalk’s pedestrian flow 7](#_Toc445413421)

[2.4.24. Start simulating pedestrian 7](#_Toc445413422)

[2.4.25. Access “Saved” crossings 8](#_Toc445413453)

[2.4.26. Access “Removed” crossings 8](#_Toc445413454)

[2.4.27. Empty the recycle bin 8](#_Toc445413455)

# **Introduction**

## **Purpose**

This test plan describes the testing approach and overall framework that will drive the testing of the Traffic Lights System. The document introduces:

* Test Strategy: rules the test will be based on, including the givens of the project; description of the process to set up a valid test.

## **Project Overview**

Traffic Lights System is a tool provided with the necessary means to regulate the traffic within Csharp city in order to prevent traffic accidents. By having control over the traffic system, the mayor’s desire of safe city will be satisfied.

The traffic simulation program can simulate different traffic situations within the city. The simulations can be adjusted for different scenarios and will provide with accurate results that can be related to real life.

# **Test Strategy**

## **Test objectives**

The objective of the test is to verify that the functionality of Traffic Lights System works according to the specifications.

## **Test Principles**

* Testing will be focused on meeting the business objectives, cost efficiency, and quality.
* There will be common, consistent procedures for all teams supporting testing activities.
* Testing processes will be well defined, yet flexible, with the ability to change as needed.
* Testing will be a repeatable, quantifiable, and measurable activity.

## **Functional Test**

Functional testing will be performed to check the functions of application. The functional testing is carried out by feeding the input and validates the output from the application.

### **Select a crossing to place**

**Purpose:** The purpose of this test is to select a crossing.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Pre-condition** | **Method** | **Expected result** | **Success?** |
| Select a crossing to place. | Simulation is not running. | 1. User enters selecting mode 2. user selects a crossing type 1 or type 2. | System updates the current selected crossing type and the GUI. |  |
| 1. User try to select the crossing without entering selecting mode | System does nothing. |  |

### 

### **Place a crossing**

**Purpose:** The purpose of this test is to place the selected crossing.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Pre-condition** | **Method** | **Expected result** | **Success?** |
| Place the selected crossing. | Simulation is not running. | 1. User enters placing mode. 2. User positions mouse over a grid slot. 3. User clicks to place the crossing on the grid. | System changes the specified grid slot to be with the specified crossing type. |  |
| 1. User enters placing mode. 2. User positions mouse outside a grid slot. 3. User clicks to place the crossing. | User is still on the mode to place a crossing, nothing changed. |  |
| 1. User enters placing mode. 2. User positions mouse over a grid slot. 3. User clicks to place the crossing on the grid which contains a crossing. | System asks user whether to remove the current crossing or not.  If user chooses yes, System changes the specified grid slot to be with the specified crossing type.  If user chooses no, nothing changed. |  |

### **Remove a crossing**

**Purpose:** The purpose of this test is to remove a crossing.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Pre-condition** | **Method** | **Expected result** | **Success?** |
| Remove a crossing. | Simulation is not running. | 1. User right clicks on a crossing. 2. User prompts system to delete the crossing | System removes it from the grid and places it into the recycle bin. |  |
| 1. User left clicks or double clicks on a crossing. | There are no changes. |  |
| 1. User try to use del from keyboard, or drags the crossing. | There are no changes. |  |

### **Create a simulation**

**Purpose:** The purpose of this test is to create a simulation.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Pre-condition** | **Method** | **Expected result** | **Success?** |
| Create a simulation. | The application is running. | 1. User prompts the system to create a new simulation. | System empties the grid and creates a new one. |  |
| System does nothing if the current grid is empty. |  |
| 1. User prompts the system to create a new simulation without saving their changes. | System asks user whether to save or not.  If yes, system saves and creates a new one.  If no, system creates a new one. |  |

### **Save a simulation**

**Purpose:** The purpose of this test is to save a simulation.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Pre-condition** | **Method** | **Expected result** | **Success?** |
| Save a simulation. | There is at least one crossing on the grid. | 1. User prompts the system to save the current simulation. 2. User specifies file name and location. | System saves the simulation. |  |
| 1. User prompts the system to save the current simulation. 2. User try to save the simulation with an existing name. | System asks user whether to replace the existing file or not.  If yes, system replaces the existing simulation.  If no, system asks user to enter a new name. |  |

### **Load a simulation**

**Purpose:** The purpose of this test is to load a simulation.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Pre-condition** | **Method** | **Expected result** | **Success?** |
| Load a simulation. | None | 1. User prompts the system to load an exist simulation. 2. User specifies file name and location. | System loads the simulation. |  |
| 1. User prompts the system to load a simulation without saving their changes. | System asks user whether to save or not.  If yes, system saves and loads an existing simulation.  If no, system and loads an existing simulation, |  |

### **Edit a road traffic flow**

**Purpose:** The purpose of this test is to edit the flow of a crossroad.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Pre-condition** | **Method** | **Expected result** | **Success?** |
| Edit a road traffic flow. | A road is selected as an active component (in an active mode). | 1. User inputs the new flow. 2. User confirms new value. | System sets the number as the current flow. |  |
| 1. User inputs a negative value or non-digit value 2. User confirms new value. | System gives an error message and asks user to re-enter a positive value. |  |

### **Start a simulation**

**Purpose:** The purpose of this test is to start a simulation.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Pre-condition** | **Method** | **Expected result** | **Success?** |
| Start a simulation. | The application is running and the simulation isn’t running. | 1. User accesses the start functionality. | System starts the execution of the simulation. |  |
| 1. User accesses the start functionality without well connected all crossings. | System gives an error message asking user to connect all crossings. |  |

### **Stop a simulation**

**Purpose:** The purpose of this test is to stop a simulation.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Pre-condition** | **Method** | **Expected result** | **Success?** |
| Stop a simulation. | Simulation is running. | 1. User accesses the stop functionality. | System stops the execution of the simulation. |  |
| 1. User accesses the stop functionality with double clicks. | System works as one click. |  |

### **Pause a simulation**

**Purpose:** The purpose of this test is to pause a simulation.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Pre-condition** | **Method** | **Expected result** | **Success?** |
| Pause a simulation. | The simulation is running. | 1. User accesses the pause functionality. | System pauses the execution of the simulation. |  |
| 1. User accesses the pause functionality with double clicks. | System works as one click. |  |

### **Restart a simulation**

**Purpose:** The purpose of this test is to restart a simulation.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Pre-condition** | **Method** | **Expected result** | **Success?** |
| Restart a simulation. | The simulation is running. | 1. User accesses the restart functionality. | System restarts the execution of the simulation. |  |
| 1. User accesses the restart functionality with double clicks. | System works as one click. |  |

### **Undo an action**

**Purpose:** The purpose of this test is to undo the last action.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Pre-condition** | **Method** | **Expected result** | **Success?** |
| Undo an action. | Simulation is not running. | 1. User accesses the undo functionality. | System restores the previous state of the application before the action was performed. |  |

### **Redo an action**

**Purpose:** The purpose of this test is to redo the last action.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Redo an action. | 1. User accesses the redo functionality. | System restores the previous state of the application before the action was undone. |  |

### **Save simulation results**

**Purpose:** The purpose of this test is to save simulation results.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Save simulation results. | 1. User accesses the save simulation functionality. 2. User selects format of the file with results and file path. | System saves results in selected format at selected file path. |  |

### **Show the help window**

**Purpose:** The purpose of this test is to view manual of the application.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Show the help window. | 1. User accesses the Help functionality. | System presents the manual of the application. |  |

### **Exit application**

**Purpose:** The purpose of this test is to exit the application.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Exit application. | 1. User accesses the close functionality. | System closes the application. |  |
| 1. User accesses the close functionality. 2. User selects to save simulation. | System saves simulation and closes the application. |  |

### **Override simulation (Add police, ambulance, firetruck cars).**

**Purpose:** The purpose of this test is to override simulation.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Override simulation. | 1. User selects the ‘override’ functionality. 2. User selects start and end points of “special” cars route. 3. User prompts system to simulate moving of “special” cars. | System displays changed simulation. |  |

### **Relocate crossing**

**Purpose:** The purpose of this test is to relocate crossing on the grid.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Relocate a crossing. | 1. User holds their left mouse button over a crossing. 2. User moves their mouse towards a desired grid slot. | System changes the crossing’s position. |  |

### **Startup the application**

**Purpose:** The purpose of this test is to startup the application.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Startup the application | 1. User makes double click on the application’s icon. | System provides the user with the initial state of the application. |  |
| 1. User right clicks on the application’s icon. 2. User prompts system to open application. | System provides the user with the initial state of the application. |  |

### **Show simulation result**

**Purpose:** The purpose of this test is to view results of the simulation.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Show simulation result. | 1. User prompts system to show results of the simulation. | System provides with the most recent results of the simulation. |  |

### **Select crossing’s component to make changes**

**Purpose:** The purpose of this test is to change component of the crossing.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Select crossing’s component to make changes. | 1. User selects crossing. 2. User selects component to change. | System applies the changes. |  |



### **Set current active crossing**

**Purpose:** The purpose of this test is to set current active crossing.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Set current active crossing. | 1. User selects the editing properties tool from the toolbox. 2. User hovers over a crossing over the grid 3. User clicks on a crossing from the grid. | System updates the current active component. |  |

### **Edit a crosswalk’s pedestrian flow**

**Purpose:** The purpose of this test is to edit pedestrian’s flow.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Edit a crosswalk’s pedestrian flow. | 1. User selects crosswalk. 2. User inputs a new value for the flow. 3. User prompts system to change flow. | System saves the value of the flow. |  |

### **Start simulating pedestrian**

**Purpose:** The purpose of this test is to simulate pedestrian’s flow.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Start simulating pedestrians. | 1. User prompts system to simulate pedestrian flow. | System starts moving the pedestrians on the places specified. |  |



### **Access “Saved” crossings**

**Purpose:** The purpose of this test is to view saved crossings

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Access “Saved” crossings. | 1. User prompts system show saved crossings. | System shows all previously saved crossings. |  |

### **Access “Removed” crossings**

**Purpose:** The purpose of this test is to view crossings which were removed.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Access “Removed” crossings. | 1. User prompts system show removed crossings. | System shows all previously removed crossings. |  |

### **Empty the recycle bin**

**Purpose:** The purpose of this test is to view crossings which were removed

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case** | **Method** | **Expected result** | **Success?** |
| Access “Removed” crossings. | 1. User prompts system to remove all crossings from the recycle bin. | System removes all items from the bin. |  |