Requirements Spec

1. Change mode of crossing

ID: UC5

Justification	different countries or situations can require different crossing loop logic which shall be supported by the crossing.
Primary Actors	Admin
Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	N/A
Post-conditions	N/A
Author	N/A
Assumptions	N/A

1.1. Requirements

Name	ID	Kind
The crossing loop shall not be active when changing the mode	UC5.REQ001	
The new crossing mode shall be able control at least the two main street and pedestrian traffic lights.	UC5.REQ002	

1.2. Scenarios

1.2.1. Scenario

1. Actor supplies the crossing with a new crossing mode.
2. System applies the new crossing mode to the crossing.

1.2.2. Simple to German crossing mode test scneario

1. Actor provides Simple crossing mode to a crossing.
2. System applies Simple crossing mode to the crossing.
3. Test if the crossing loop logic is the same as the logic defined in the Simple crossing mode.
4. Actor provides German crossing mode to a crossing.
5. System applies German crossing mode to the crossing.
6. Test if the crossing loop logic is the same as the logic defined in the German crossing mode.

2. Control crossing

ID: UC4

Justification	because admin wants to be able to control all traffic lights in a crossing for the crossing to be useful.

Primary Actors	Admin
Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	N/A
Post-conditions	N/A
Author	N/A
Assumptions	N/A

2.1. Requirements

Name	ID	Kind
All states of all traffic lights must be part of the crossing loop.	UC4.REQ006	
If any left or right street traffic light is at PASSING state all pedestrian traffic lights shall be at STOP state.	UC4.REQ008	
If the traffic light on a horizontal axis has a TRANSITION or PASSING state then the light on the vertical axis shall have a STOP state	UC4.REQ005	
Opposite Street- and Pedestrian traffic lights placed on the same axis shall be synchronized.	UC4.REQ007	
The maximum amount of traffic lights on each axis shall be three.	UC4.REQ001	
There shall be at least one main street traffic light on the horizontal axis	UC4.REQ003	
There shall be at least one main street traffic light on the vertical axis	UC4.REQ004	
There shall be at least two main street- and pedestrian-traffic lights in a crossing	UC4.REQ002	

2.2. Scenarios

2.2.1. Scenario

1. Actor activates crossing.
2. System activates crossing loop.
3. Actor deactivates crossing.
4. System deactivates crossing loop.

2.2.2. Test scenario for crossing

1. Actor activates the crossing.
2. System should start horizontal traffic first.
3. Actor verifies that the transition is in a specific order.

4. System should stop horizontal traffic and start vertical next.
5. Actor verifies that the horizontal traffic has stopped and the vertical has started.
6. System continues the crossing loop.

3. Control light behaviour

ID: UC3

The light behaviour controls the transitioning of the light states of the traffic light. Basically the traffic light has the light behaviour (or the light state as we defined it with the Enum), which has different states that can be navigated to. The states are controlled separately from the traffic light.

Justification	Light behaviors can have multiple states which should be reachable
Primary Actors	Admin
Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	N/A
Post-conditions	N/A
Author	N/A
Assumptions	N/A

3.1. Requirements

Name	ID	Kind
A state shall determine if it allows users to pass or not	UC3.REQ003	
A state shall only have one state to which it can switch to next	UC3.REQ004	
A traffic-light state sequence shall have at least one state which allows users to pass through	UC3.REQ002	
The order of the states shall be pre-defined	UC3.REQ001	

3.2. Scenarios

3.2.1. Scenario

1. Actor requests state change on traffic light.
2. System changes state of traffic light.

3.2.2. Test: changeState of German Pedestrian Light Behaviour

1. Actor requests change state from RED_LIGHT to GREEN_LIGHT
2. System changes state to GREEN_LIGHT
3. Assert that the new state is GREEN_LIGHT

3.2.3. Test: changeState of German Street Light Behaviour

1. Actor requests change state from RED_LIGHT to YELLOW_LIGHT
2. System changes state to YELLOW_LIGHT
3. Actor requests change state from YELLOW_LIGHT to GREEN_LIGHT
4. System changes state to GREEN_LIGHT
5. Assert that the new state is GREEN_LIGHT

4. Change shape of traffic light

ID: UC2

The shape of the traffic light together with the color of the light define the signal of the street traffic light. For pedestrian traffic lights the shape does not define the signal but can vary depending on the location of the traffic light, therefore the shapes for both Street and Pedestrian traffic lights can be changed.

Justification	Different counties or locations can have different shape of lights in their traffic lights.
Primary Actors	Admin
Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	N/A
Post-conditions	N/A
Author	N/A
Assumptions	N/A

4.1. Requirements

Name	ID	Kind
A traffic light shall only have one active shape	UC2.REQ001	
The combination of shape, type and name of the light shape must be unique	UC2.REQ002	
Type of the shape shall match the type of the traffic light	UC2.REQ003	

4.2. Scenarios

4.2.1. Pedestrian traffic light scenario

1. Actor supplies new pedestrian light shape to pedestrian traffic light.
2. System changes shape of traffic light with the new shape.

4.2.2. Street traffic light scenario

1. Actor supplies new street light shape to street traffic light.
2. System changes shape of traffic light with the new shape.

4.2.3. Pedestrian shape test scenario

1. Actor supplies new pedestrian shape to pedestrian traffic light.

2. System changes shape of the traffic light.
3. Test if the supplied shape is equal to the supplied shape.

4.2.4. Street shape test scenario

1. Actor supplies new street shape to street traffic light.
2. System changes shape of the traffic light.
3. Test if the supplied shape is equal to the supplied shape.

5. Change light behavior of traffic light

ID: UC01

The admin might want to change the light patterns of the traffic light.

Justification	Traffic light should support different light behaviors.
Primary Actors	Admin
Level	N/A
Complexity	N/A
Use Case Status	N/A
Implementation Status	N/A
Preconditions	The type of light behavior shall be compatible with the type of traffic light.The new light behavior shall be compatible with the local law.
Post-conditions	N/A
Author	N/A
Assumptions	N/A

5.1. Requirements

Name	ID	Kind
The new light behavior shall be compatible with the local law.	UC01.REQ001	
The type of light behavior shall be compatible with the type of traffic light.	UC01.REQ002	

5.2. Scenarios

5.2.1. Pedestrian traffic light scenario

1. Actor supplies new pedestrian light behavior to pedestrian traffic light.
2. System applies new pedestrian light behavior to the pedestrian traffic light.

5.2.2. Street traffic light scenario

1. Actor supplies new street light behavior to street traffic light.
2. System applies new street light behavior to the street traffic light.

5.2.3. Test Scenario: Pedestrian: change behavior from German to Dutch

1. Actor supplies Dutch pedestrian light behavior

2. System applies Dutch light behavior to traffic light
3. Test if the predefined sequence is correct.

5.2.4. Test Scenario: Pedestrian: change behavior from Dutch to German

1. Actor supplies German pedestrian light behavior
2. System applies German light behavior
3. Test if the predefined sequence is correct.

5.2.5. Test Scenario: Street: change behavior from Dutch to German

1. Actor supplies German street light behavior to street traffic light
2. System applies German street light behavior to traffic light
3. Test if the predefined light sequence is correct.

5.2.6. Test Scenario: Street: change behavior from German to Dutch

1. Actor supplies Dutch street light behavior to street traffic light
2. System applies Dutch street light behavior to traffic light
3. Test if the predefined light sequence is correct.