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FOLDOUT

Deliverable 4.2
Use cases and scenarios

Document

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1 Introduction

Through-foliage detection, including in the outermost regions of the EU (FOLDOUT) is an EU funded project within H2020 framework, addressing topic SEC-20-2016: Border Security: autonomous system and control systems that commenced on the 1st September 2018 (42 months duration).

FOLDOUT focus is on detecting and tracking activity in foliated areas, in the inner and outermost regions of the EU.

WP4 - Requirements & Scenario Planning is focused on studying and specifying the requirements of the targeted users from Bulgaria, Finland, French Guiana, Greece, Poland, and Lithuania with respect to the proposed platform.

As part of WP4, in Task 4.2 the Definition of use cases and scenarios for FOLDOUT is required. This deliverable is related to Task 4.2 and focuses on the definition of use cases and scenarios with respect to user requirements (T4.1) and proposed tools, systems and platform. In this task the development of scenarios and use cases was done taking into account following consideration: i) Detection of irregular border crossings (illegal migrants + vehicles) in forest terrain border surveillance (Bulgarian and Greek scenarios); ii) Detection of illegal transport and entry of goods (trafficking) in temperate broadleaf forest and mixed terrain border surveillance (Finland, Lithuania, and French Guiana Scenario); iii) Detection of persons & vehicles in a search & rescue operation in forest terrain.

1.1 Purpose of the document

Deliverable 4.2 was prepared under T4.2 of WP4 and aims in presenting a set of scenarios and use cases that will be used during the project life of developing, testing and evaluation of FOLDOUT platform.

1.2 Document scope

This document is CO and will be used by all partners of the FOLDOUT project.

1.3 Partners

This deliverable was based on work conducted from FOLDOUT partners presented in Table 1.

No	Partner Names	Short Name	Country
	Bulgarian Defence Institute	BDI	BG
	Glavna Direktsia Granichna Politsia	CDBP	BG
	AUSTRIAN INSTITUTE OF TECHNOLOGY	AIT	AT
	EUTEMA	EUTEMA	AT
	ITTI SP	ITTI	PL
	EUROPEAN DYNAMICS BELGIUM	ED	BE

	TEKNOLOGIAN TUTKIMUSKESKUS VTT OY	VTT	FI
	OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES	ONERA	FR
	BHE BONN HUNGARY ELEKTRONIKAI	BHE	HU
	ETICAS RESEARCH AND CONSULTING	ETICAS	ES
	RAJAVARTIOLAITOS	RAJA	FI
	KENTRO MELETON ASFALEIAS	KEMEA	EL
	THALES ALENIA SPACE FRANCE	TASF	FR
	ONF INTERNATIONAL	ONFI	FR
	KOMENDA GLOWNA STRAZY GRANICZNEJ	PBG	PL
	VALSTYBES SIENOS APSAUGOS TARNYBA PRIE LIETUVOS RESPUBLIKOS VIDAUS REIKALU MINISTERIJOS	SBGS	LT

Table 1. D4.2 FOLDOUT Partners

2 Deliverable description

In the following paragraphs, the structure of the deliverable is displayed (Figure 1) and the content of each chapter is summarized.

Deliverable 4.2 Structure	1. Intoduction
	2. Deliverable description
	3. User scenarios and use case developing methodology
	4. Scenario Bulgaria - BG01
	5. Scenario Finland - FI01
	6. Scenario French Guiana - GF01
	7. Scenario Greece - GR01
	8. Scenario Lithuania - LT01
	9. Use cases modeling
	10. Summary

Figure 1. Deliverable 4.2 structure

3 User scenarios and use case developing methodology

In this chapter the methodology for scenarios and associated use cases development is explained.

Developed scenarios and use cases follow the structure provided below:

- **General description**
  - Story. Please, fill in the overall description of scenario, story of it regarding general context, main goal that have to be achieved through every specific scenario.
  - Landscape. Please, describe the geographic area where the scenario and its associated use cases will take place. It's suitable that to taking into account an area with, minimum 30 km radius. Landscape is very important to be described by the locals that should know better the terrain and its limitations.
  - Threats description. Please, add a list with main threats that you intent to discover through using the FOLDOUT platform. For each threat provide a specific description related, at least, to the kind of threat, dimensions of the objects or being that are considered as threats, wideness of threat, etc.
  - Scenario's objectives. Please, set up the objectives of scenario that will be verified through unfolding the scenario's associated use cases. The objectives have to be simple, measurable, each objective having associated one or many use cases.
  - Equipment/systems/sensors involved. Please, fill the equipment/ systems/sensors that is foreseeable to be used for each scenario. Also, please take care that split the equipment/ systems/sensors in the: "already existing on the end user premises" and "FOLDOUT developed" categories.
- **Scenario's use case description**
  - Name: A representative name for a specific use case
  - Current version: Starting from version 01. This will be changed after every iteration that change any parameter set up in a previous iteration.
  - Associated scenario: The scenario to which the use case belongs. Rarely, one use case could verify two or many scenarios (or parts of scenarios).
  - Summary: Please, describe the overall context of use case, also using data from scenario description.
  - Logical steps: The first phase of use case will capture only the operational steps (that will be filled in by end users), following that in the further iterations to be completed with technical steps, in this way, on the final document, the use case can be rolled and watched for both points of view, operational and technical.

- Initiating actor/s: Describe the trigger of starting use case (for operational steps) who/which could be a person or machine.
- Supporting actors: Please, assign the actors that will carry on the logical steps who/which could be a person or machine.
- Inputs:
  - Content flow: Please, explain the kind of data that are received by initiating actor/s
  - Information flow: Please, explain the kind of information that are received by initiating actor/s
  - Control flow: Please, explain the kind of data and information indicating the supporting actors that will dealing with during all process of use case unfolding, also describing the whole pipe line (through supporting actors)
- Outputs:
  - Content output: Please explain the final data resulting from use case that will serve as an input for another (if in case)
  - Information output: Please explain the information resulting from use case that will serve as an input for another (if in case)
- Pre-conditions: Please, list the pre-conditions regarding equipment/ systems/sensors used, time of day, weather, other relevant.
- Post-conditions:
  - Succeed: Please, set out and explain the use case success parameters (one or more)
  - Fail: Please, set out and explain the use case fail parameters (one or more)

Based on this structure 5 (five) scenarios and 17 (seventeen) associated use cases are developed.

4 Scenario Bulgaria - BG01
See Annex A

5 Scenario Finland - FI01
See Annex A

6 Scenario French Guiana - GF01
See Annex A

7 Scenario Greece - GR01
See Annex A

8 Scenario Lithuania - LT01
See Annex A

9 Use cases modeling
See Annex A

10 Conclusions

This report describes the FOLDOUT WP4 - Requirements & Scenario Planning, task T4.2. Definition of use cases and scenarios

The first part of the report represent used methodology for scenarios and associated use cases development. In chapter 3 specific section (elements) and questions that need to be taken into consideration during the development of the scenarios and use cases are defined. Explanation what need to be presented, by which way and appropriate information is defined.

In the second part of the report (chapter 4-9) in details, 5 scenarios and 17 associated use cases are presented, namely:

- Countering illegal migration on the Bulgarian-Greek and Bulgarian-Turkish borders
- Facilitated illegal immigration (RUS-FIN)
- Illegal gold mining in French Guiana
- Persons visiting the front boundary of the border zone with a tractor.
- Illegal migrants approaching the border zone.
- Illegal migrants approaching the border zone with a boat.
- Smuggling of cigarettes (LT-BY)

The third part of the deliverable presents use case modeling (chapter 9). Based on developed scenarios and use case in previous chapters this in this chapter partners develop use case diagrams. Use case diagrams address the static use case view of a system. Use case diagrams are powerful tool for representation of interaction between the users and systems by showing relations between the user and different use cases.

All relevant use cases were modelled and these diagrams will serve as a basis for developing, testing and evaluation of FOLDOUT platform. Use cases diagrams are foreseen to be used by both technical partners and end users to achieve common understanding of the platform.

Appendix A. Scenarios and associated use cases

1 Scenario Bulgaria - BG01

1.1 General description

Story.

[redacted]

Threats description.

[redacted]

[redacted]

Scenario's objectives.

[redacted]

Equipment/systems/sensors involved.

[redacted]

[redacted]

1.2 Scenario's use case description

Use case (BG01.01)			
Name	[redacted]	Current version	[redacted]
Associated scenario	[redacted]		
Summary	[redacted]		
Logical steps	[redacted]		


Initiating actor/s
Supporting actors
Inputs
Outputs
Pre-conditions


Post-
conditions

2 Scenario Finland - FI01

2.1 General description

Story.

[redacted]

[redacted]

Scenario's objectives.

[redacted]

Equipment/systems/sensors involved.

[redacted]

2.2 Scenario's use case description

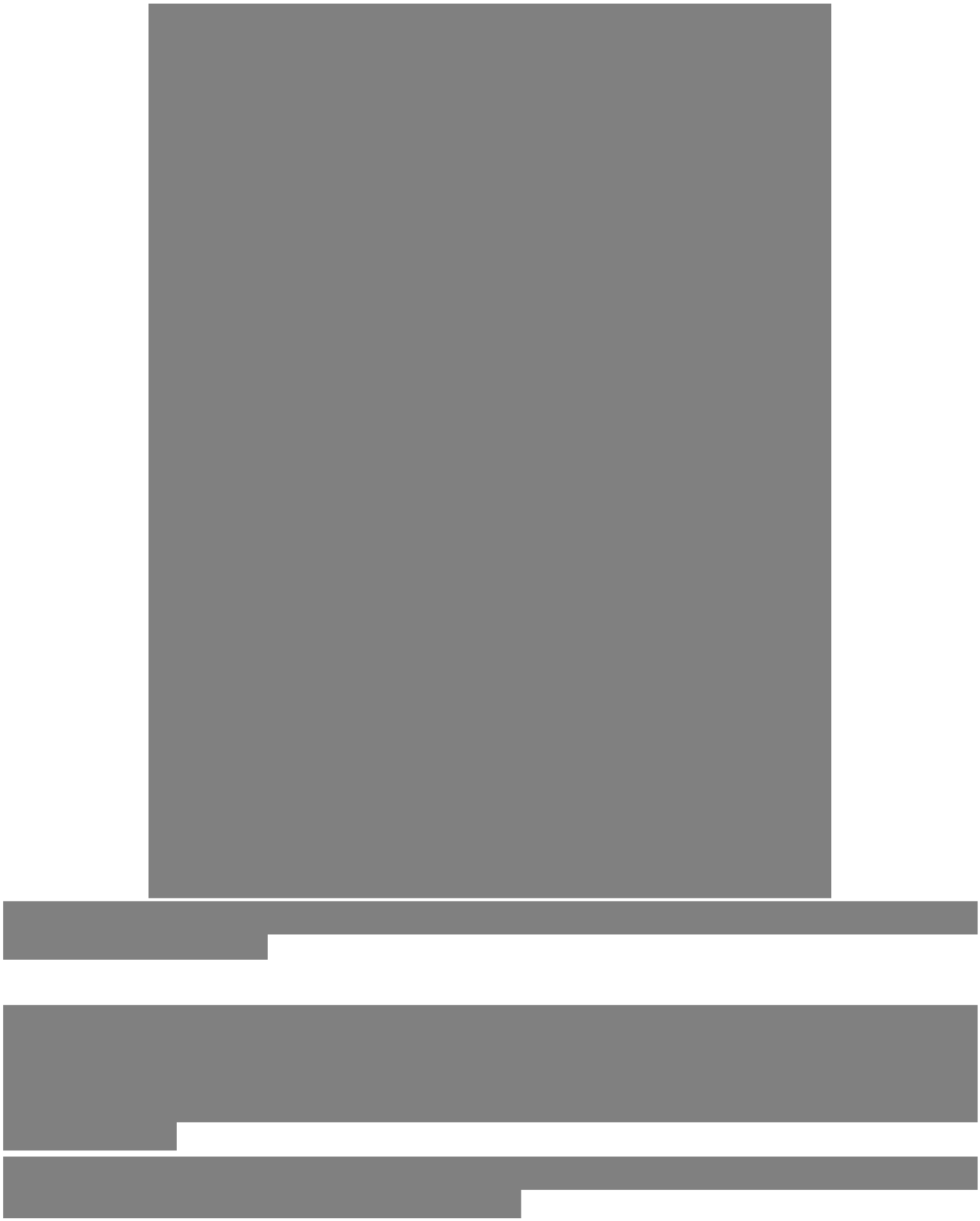
Use case (FI01.01)			
Name		Current version	
Associated scenario			
Summary			
Logical steps			
Initiating actor/s			
Supporting actors			
Inputs			


Outputs
Pre-conditions
Post-conditions

3 Scenario French Guiana - GF01

3.1 General description

Story.



Threats description.

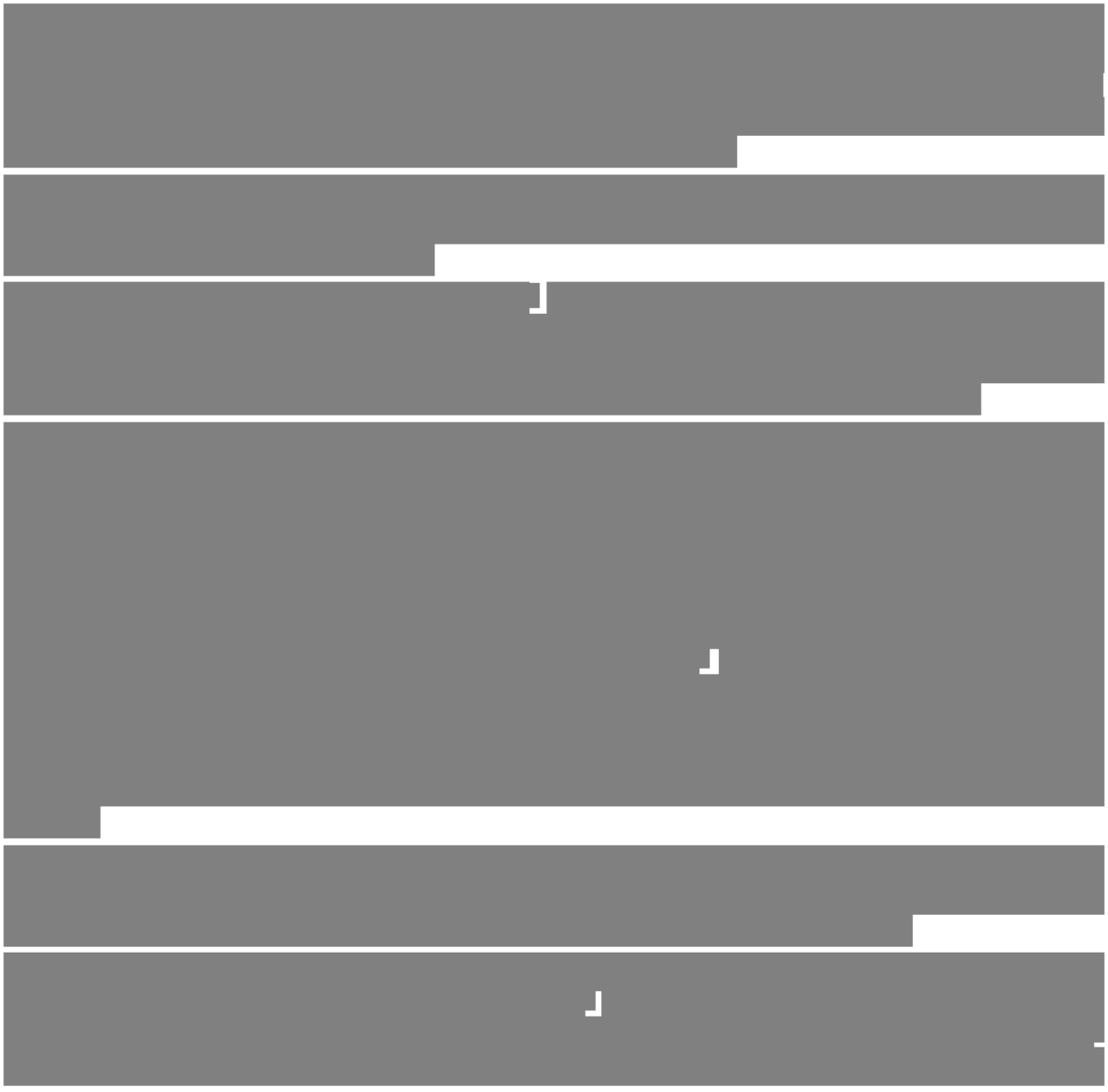
[redacted]

Scenario's objectives.

[redacted]

Equipment/systems/sensors involved

[redacted]



[redacted]

3.2 Scenario's use case description

Use case (GF01.01)			
Name	[redacted]	Current version	[redacted]
Associated scenario	[redacted]		
Summary	[redacted]		
Logical steps	[redacted]		
Initiating actor/s	[redacted]		
Supporting actors	[redacted]		
Inputs	[redacted]	[redacted]	
	[redacted]	[redacted]	

[redacted]

	[redacted]	[redacted]
Outputs	[redacted]	[redacted]
Pre-conditions	[redacted]	
Post-conditions	[redacted]	[redacted]

4 Scenario Greece - GR01

4.1 General description

Story.

Threats description.

Scenario's objectives.

Equipment/systems/sensors involved.

[redacted]

4.2 Scenario's use case description

Use case (GR01.01)			
Name	[redacted]	Current version	[redacted]
Associated scenario	[redacted]		
Summary	[redacted]		
Logical steps	[redacted]		
Initiating actor/s	[redacted]		

Supporting actors	[redacted]
Inputs	[redacted]
	[redacted]
	[redacted]
Outputs	[redacted]
	[redacted]
Pre-conditions	[redacted]
Post-conditions	[redacted]
	[redacted]

[redacted]

[redacted]

Use case (GR01.02)			
Name	[redacted]	Current version	[redacted]
Associated scenario		[redacted]	
Summary	[redacted]		
Logical steps	[redacted]		
Initiating actor/s		[redacted]	
Supporting actors		[redacted]	
Inputs	[redacted]	[redacted]	
Outputs	[redacted]	[redacted]	

Pre-conditions		
Post-conditions		

Use case (GR01.03)			
Name		Current version	
Associated scenario			
Summary			

	[redacted]
Logical steps	[redacted]
Initiating actor/s	[redacted]
Supporting actors	[redacted]
Inputs	[redacted]
Outputs	[redacted]
Pre-conditions	[redacted]
Post-conditions	[redacted]

5 Scenario Lithuania - LT01

5.1 General description

Story.

[redacted]

Threats description.

Scenario's objectives.

.

Equipment/systems/sensors involved.

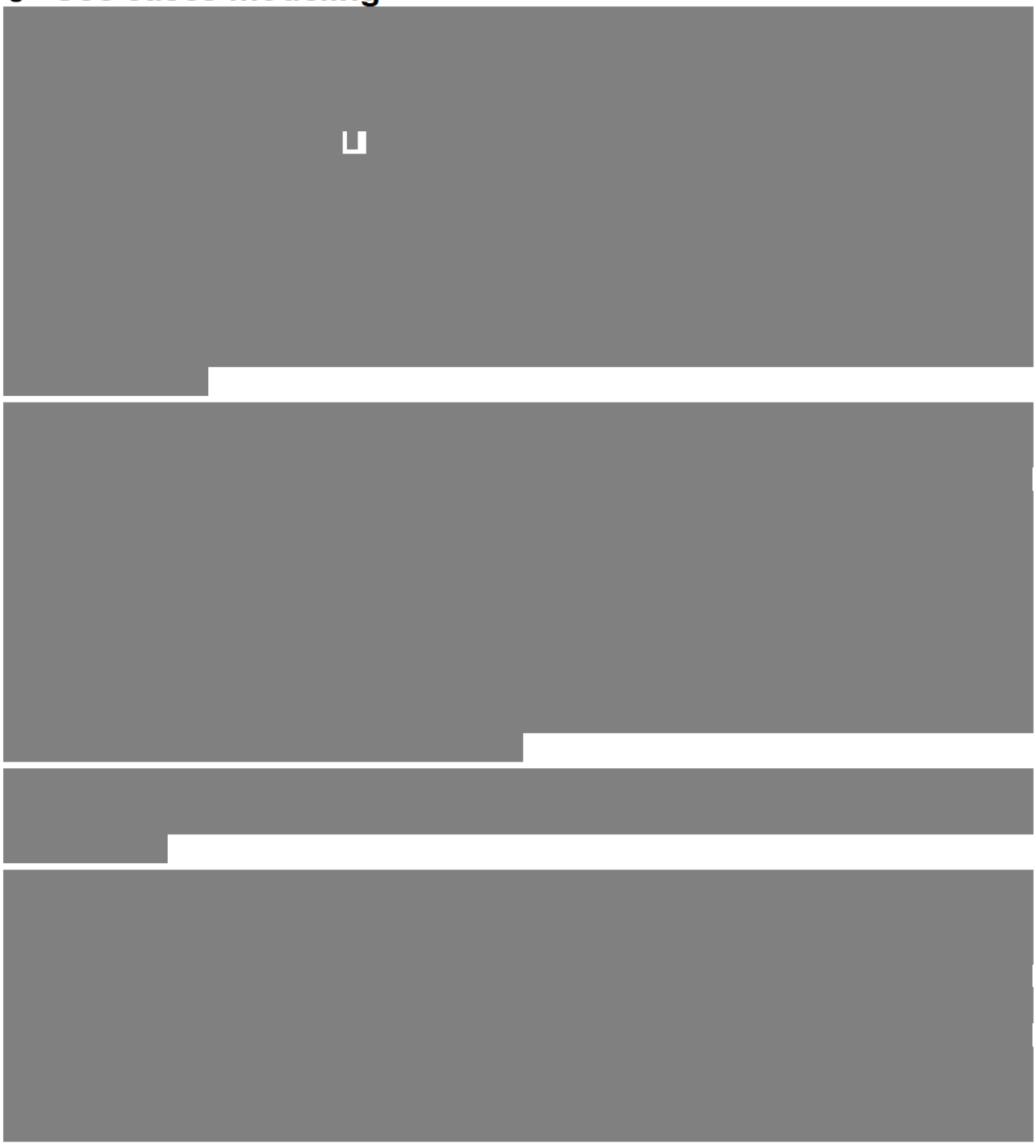
[redacted]

5.2 Scenario's use case description

Use case (LT01.01)			
Name	[redacted]	Current version	[redacted]
Associated scenario	[redacted]		
Summary	[redacted]		
Logical steps	[redacted]		


Initiating actor/s
Supporting actors
Inputs
Outputs
Pre-conditions
Post-conditions

6 Use cases modeling



[7] Unified Modeling Language User Guide, The (2nd Edition) (Addison-Wesley Object Technology Series). 1999.


Scenario
DETECTION: Movement outside EU territory
DETECTION at border line


DETECTION inside the border zone
DETECTION: inside the country
DETECTION of tracks
IDENTIFI-CATION


TRACKING outside EU territory
TRACKING: Persons inside EU territory
TRACKING: vehicles