PANTHEON

Community-Based Smart City Digital Twin Platform for Optimised DRM operations and Enhanced Community Disaster Resilience

D8.3

EXECUTION PLAN FOR PILOT 1 – USE CASE SCENARIO IN ATHENS

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TASK ABSTRACT

Deliverable 8.3 "Execution plan for Pilot 1 – Use Case Scenario in Athens" encompasses the user handbook and also guidelines related to the first of the two Tabletop Exercises (TTXs) to be organised in the context of the PANTHEON project, in Athens, Greece during the 16th and 17th of September 2025. The Deliverable includes exercise-relevant information i.e., participants and their role in the TTX (players, observers, evaluators), the scenarios and the technologies to be used and validated by the perspective of the end users, who will participate.

[1] Please indicate the type of the deliverable using one of the following codes:
R = Document, report
DEM = Demonstrator, pilot, prototype, plan designs
DEC = Websites, patents filing, press & media actions, videos
DATA = data sets, microdata
DMP = Data Management Plan
ETHICS: Deliverables related to ethics issues.
OTHER: Software, technical diagram, algorithms, models, etc.

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PU = Public
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TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

Abbreviation	Meaning
AI	Artificial Intelligence
AAR	After-Action Report
CBDRM	Community Based Disaster Risk Management
CEN	European Committee for Standardization
CWA	CEN Workshop Agreement
DRM	Disaster Risk Management
DSS	Decision Support System
DVI	Disaster Victim Identification
EMS	Emergency Medical Service
EPPO-ITSAK	Earthquake Planning and Protection Organisation - Institute of Engineering Seismology and Earthquake Engineering
GEIN-NOA	Geodynamic Institute - National Observatory of Athens
IoT	Internet of Things
ISO	International Organization for Standardization
KPI	Key Performance Indicator
NE	Northeast
NNE	North Northeast
R	Richter scale
SCDT	Smart City Digital Twin
SUS	System Usability Scale
SW	Southwest
TRL	Technology Readiness Level
TTX	Tabletop Exercise
UAB	User Advisory Board
UAV	Unmanned Aerial Vehicles
UI	User Interface
Wi-Fi	Wireless Fidelity
WUI	Wildland Urban Interface
XGM	Exercise Guidance Methodology

EXECUTIVE SUMMARY

This Deliverable comprises the execution plan for the first tabletop exercise (TTX) of the PANTHEON project, which will be conducted in Athens, Greece, between the 16th and 17th of September 2025. The exercise will be hosted by the Center for Security Studies (KE.ME.A), at its premises, and will be led and coordinated by the Hellenic Police (HPOL). In the present Deliverable, significant data regarding the exercise and its characteristics are introduced, along with basic information about the technologies developed within the project and utilised in the TTX as well as the scenarios and Use Cases that have been selected and will be examined during the two days event. In addition, the methodology to be followed for the end user validation of the under-examination technologies is presented, although detailed description of the evaluation analysis will be included in D8.6 "Pilots' outcomes and recommendations".

FACTSHEET

PURPOSE / OBJECTIVES

The main purpose of the PANTHEON TTXs is to present the Smart City Digital Twin (SCDT) technology, developed under the framework of the project, and introduce it as a new tool that will facilitate first responders' training and planning procedures. The initial target groups i.e., end users that will utilise, evaluate and provide recommendations about the SCDT, are the Hellenic Police and the Johanniter, both organisations being project partners and coordinators of the two TTXs, which will be held in Athens and Vienna respectively. For the Athens exercise, two scenarios have been selected that correspond to the two Use Cases i.e., training and planning. These scenarios involve the occurrence of two natural hazards, a wildfire and an earthquake, which can potentially affect, to a significant extent, the Region of Attica. The operational plans of the Hellenic Police for the response to such emergencies have been discussed and analysed and are presented in the current Deliverable. The objective of the TTX is to utilise the SCDT and examine the level, to which this technology can provide added value to response operations. Right after the termination of the exercise, discussions will be held with the aim of collecting feedback from the participants, highlighting strengths and weaknesses of the system and collecting recommendations for further development and improvement. Finally, User Advisory Board (UAB) members and also external end users are expected to participate as observers in the TTX, witness the usage of the SCDT and identify operational aspects, which could be favoured by this technology.

REGISTRATION

Participants from inside the PANTHEON Consortium, were invited through email invitations that were sent by the TTX host (KEMEA) to the whole Consortium, asking partners to confirm, or not, their physical presence in the TTX. Regarding UAB members and external stakeholders, formal invitations were sent by the TTX coordinator (HPOL).

PARTICIPANTS

Approximately 50 people are expected to participate in the first PANTHEON TTX. The participants derive from the following three groups:

a) The PANTHEON Consortium,
b) Members of the UAB established in the context of PANTHEON and specifically of T1.2 "Engagement and involvement of CBDRM stakeholders", namely from the Independent Civil Protection Directorate of the Region of Attica,
c) Other first responders, external to the project, namely from the Hellenic Fire Service and the Hellenic National Emergency Centre.

TRAINING FOR THE TTX

Although a detailed and hands-on training session is not expected to be carried out prior to or during the TTX, PANTHEON partners and particularly ISPC will have prepared a presentation of the SCDT system and its components that are expected to be showcased in the execution of the two Use Cases and scenarios, along with some guidance relevant to the utilisation of the system. This short training will take place, according to

the agenda (Subchapter 2.6 and Annex 1), during the "Presentation of the SCDT system" slot, just before the initiation of the first Use Case. In addition, brochures regarding the system and its usage will be distributed to the participants upon their arrival and registration to the TTX.

1 INTRODUCTION

This document provides basic and useful information related to the planning and conduct of the first PANTHEON TTX and is specifically related to the Greek Use Cases.

1.1 BACKGROUND INFORMATION

PANTHEON develops a SCDT technology. Under this framework, Use Cases are being used to validate and evaluate the SCDT system and its components in crisis/disaster management. Thus, this TTX is being planned and implemented to mainly validate PANTHEON's usability.

The exercise guidelines provided herein are based on the following documents:

- The CWA 17514:2020 "Systematic assessment of innovative solutions for crisis management - Trial Guidance Methodology".

- The eXercise Guidance Methodology (XGM) developed under the framework of the STRATEGY project.

- The ISO 22398:2013 Societal security — Guidelines for exercises.

- The CWA 18009:2023 Evaluation of exercises - Implementation Guidelines.

1.2 SCOPE OF THE DEVELOPING SMART CITY DIGITAL TWIN SYSTEM

The Smart City Digital Twin (SCDT) solution, as developed within the PANTHEON project, is a modular digital platform designed to help local authorities and first responders to plan for and prepare against natural and man-made disasters. It essentially acts as a virtual mirror of the city, enabling users to run simulations, model disasters, plan population evacuations and make data-driven choices. The system combines data integration, simulations, artificial intelligence (AI) and easy-to-use visual interfaces to create an interactive planning and training environment. The system is particularly designed for disaster risk management (DRM) at the community level.

1.2.1 CORE PURPOSE AND FUNCTIONALITY

The SCDT is not a single application but a modular and layered system consisting of various specialised components. At its heart, a disaster-impact simulation engine enables users to simulate disasters e.g., earthquakes, wildfires at high fidelity and observe real-time damage estimates. An AI-based evacuation-planning module then determines safest paths for citizens and first responders, adapting dynamically to blocked roads or damaged infrastructure. In tandem, a UAV-swarm coordinator automatically allocates drone flight paths to gather latest imagery for instant post-event assessment. Decision-support systems translate this incoming data into concrete actions, while a geospatial, map-based system exposes everything in an intuitive, interactive interface so operators may select scenarios, view outcomes evolve and modify system parameters. The SCDT is designed as a planning tool (for creating response strategies in anticipation of an event) and a training tool (for exercising such strategies through realistic scenarios). During each Tabletop Exercise (TTX), both aspects will be demonstrated.

1.2.2 KEY CAPABILITIES & LIMITATIONS

The SCDT merges Internet of Things (IoT) sensor feeds, satellite imagery, drone pictures and baseline maps into a combined, live operational picture, enabling responders to have real-time situational awareness that

they actually need rather than the piecemeal snapshots that they usually get. It also acts as a training sandbox, to enable emergency teams to exercise procedures, stress-test coordination and review their own decision-making without the need to wait for the next real disaster. It considers social-vulnerability layers—e.g. demographics, critical-infrastructure dependencies etc, and it enables targeting specifically those populations which would be more exposed. While current pilots target Athens and Vienna, the architecture is deliberately city-agnostic and hazard-agnostic by design, and as such, its deployment elsewhere would constitute a configuration exercise, rather than a ground-up development. That said, the technological maturity of the platform is modest (TRL-5), i.e., not all the designed services are fully mature, and performance in high-load, live-incident conditions still needs further verification and validation. System complexity, data-ownership constraints and toolset heterogeneity remain acknowledged challenges. Its major capabilities along with their purpose in the TTX are presented in the table below:

Table 1: Capabilities and purpose of the SCDT in the TTXs.

Capability	Purpose in TTX
Hazard-impact simulation	Provides disaster impact to guide strategic decisions
UAV swarm planning & sensing	Creates aerial imagery of blocked roads, hot spots and building damage
Population-routing DSS	Calculates safest evacuation corridors and travel times
Route planning for First Responders	Dynamically suggests available routes for first responders based on hazard damage
Interactive UI	Allows operators to modify scenario configuration, trigger simulations, and visualise outcomes on a common operational picture

Only the modules relevant to a particular use-case are activated, keeping the exercise focused yet realistic.

1.2.3 END GOAL

The objective of the SCDT is to enhance preparedness, coordination and operational efficiency in disaster scenarios. It merges technical innovation and community engagement to create a usable, reliable and user-oriented decision-support system, closing the gap from simulation to real-world disaster response.

1.3 BRIEF DESCRIPTION OF THE TTX

The TTX will be held from the 16th till the 17th of September 2025. During the 16th the implementation of the two identified Use Cases will take place, covering the whole day, whereas on the 17th the evaluation of the TTX will be conducted.

For the TTX, two Use Cases and two respective scenarios have been developed:

1. Use Case 1 is related to planning and early warning according to simulations. More specifically, models and simulations, based on big amounts of data are expected to be used in order to estimate the evolution of the disaster scenario, i.e., the occurrence of an earthquake in the vicinity of Athens

(Western Attica), thus supporting the development of emergency plans and serving as early warning systems through continuous monitoring.

2. Use Case 2 is related to first responders' training. Particularly, the SCDT is expected to facilitate cross-organisational training, increasing the mutual understanding of needs during disaster response and bridging the gap between large-scale exercises and abstract TTX. This Use Case is combined with the scenario of a wildfire occurring on the SW slopes of Mt. Parnitha, close to the town of Fyli, which threatens not only citizens but also nearby infrastructure.

During the TTX, the scenarios of the two Use Cases will evolve in a step-by-step manner, with the concurrent utilisation of the SCDT and its respective components, with the aim of exploring the added value that the system brings to the participating first responders' organisations (namely the HPOL, for the TTX in Athens, and the JOAFG, for the TTX in Vienna) and their operational procedures and deployment.

2. TTX EXECUTION

This chapter contains information with regards to the actual implementation of the TTX in Athens including, inter alia, information about the location of the event, the participating organisations, the agenda, the components of the SCDT system to be used for the two Use Cases, the equipment that will be utilised for the TTX conduct and the description of the two scenarios.

2.1 FORMAT

The TTX is by definition conducted in a discussion-based manner, with the same also applying to the PANTHEON exercises. Physical presence is required especially regarding the players of the TTX (namely the Hellenic Police), whereas both Consortium and external participants are expected (details to be provided in subchapter 2.3). In addition, online participation for Consortium members e.g., technical partners, not capable of being present, will be available.

2.2 LOCATION

The TTX will be hosted by KEMEA at its premises, namely the large conference hall that is used by KEMEA and the HPOL for similar events and circumstances.

2.3 PARTICIPANTS' ROLES

Participants are divided into three main categories, depending on the role they are having in the TTX:

- players, whose role is to have actual interaction with the SCDT system. Two subtypes of players are identified:
    - The system operator, who acts as a trainer and is the one who operates the SCDT.
    - Simulated decision makers, who receive training by the system operator on the usage of the system.
- observers, whose role is to observe the TTX without interfering with the players or the system and provide their feedback in the hot wash debrief and the evaluation questionnaire that will follow after the termination of the TTX, and
- the evaluators, who again do not interfere with the system and the players, however they monitor and document the exercise, keep notes of discussions and remarks during the hot-wash debrief and provide significant inputs to the After- Action Report that will incorporate, among others, the evaluation results.

The following table presents the participants and their assigned roles in the TTX.

Table 2: TTX participants and roles in the TTX

Affiliation	Role in the Exercise
HPOL	TTX Coordinator / Player
KEMEA	TTX Host / Evaluator
JOAFG	First responder / Evaluator
THL	SCDT component developer / Observer
ENAC	SCDT component developer / Observer
INTEROPTICS	SCDT component developer / Observer

ISPC	Training material provider / Evaluator
Independent Civil Protection Directorate of the Region of Attica	UAB member / Observer
Hellenic Fire Service	First responder / Observer
Hellenic National Emergency Center	First responder / Observer

2.4 SCDT SYSTEM COMPONENTS FOR THE USE CASES

During the TTX and the implementation of the two Use Cases, the Smart City Digital Twin system, developed in the context of PANTHEON will be utilised. However, the SCDT consists of various components / modules. Some are horizontal, others are utilised depending on the scope and objectives of each Use Case. Therefore, two tables are developed showcasing the components that will be operated in the two Use Cases of the Athens TTX.

Table 3: SCDT components to be used for Use Case 1, Planning-Earthquake

SCDT Component	Description of the Component
User Interface	The user can select the magnitude and intensity of the earthquake simulation (low, medium, high), run it and display the result as a building damage heatmap. Moreover, the user can configure a UAV swarm flight, run it and display the result of the scan. Finally, the user can set up and display evacuation areas, assembly points, destination points and vehicle availability. In particular, the user can request the optimal route to perform the corresponding evacuation and display the result in the screen.
Impact Simulation	The user selects the intensity of the earthquake scenario (low, moderate, high). After the selection, the impact of such an earthquake is depicted through the UI to the user.
UAV swarms	The user defines the area to be scanned as well as the number and type of UAVs available. Then the algorithm splits the area and allocates each sub-area to a UAV. Finally, the path planning algorithm computes the path to be followed by each UAV. The swarm sends back to the UI and/or back-end data such as damaged buildings, casualties and blocked roads.
Routes selection	The user selects the existing resources on the map. The system then provides to the user available routes to follow to reach specific assembly points on the map.
Population routing DSS	AI-supported algorithm finding the optimal routes to be followed by the local population, in order to gather at the predefined point (local sports stadium), avoiding blocked/damaged roads.

Table 4: SCDT components to be used for Use Case 2, Training-Wildfire

SCDT Component	Description of the Component
User Interface	The user can display the result of fire and smoke simulation in conjunction with time (time bar). Moreover, the user can configure a UAV swarm flight, run it and display the results of the scan. Furthermore, the user can set up and display evacuation areas, assembly points, destination points and vehicle availability. In particular, the user can request the optimal route to perform the corresponding evacuation and display the result in the screen.
Fire propagation simulation	The user runs the wildfire scenario and the propagation of the wildfire and its smoke is depicted through the UI to the user.

UAV swarms	A dedicated area will be defined for a swarm of UAVs to scan and detect fire propagation. The algorithm splits the whole area into sub-areas where each UAV scans with a sweeping pattern. The swarm sends back to the UI data such as aerial images of the wildfire phenomenon.
Routes selection	The user selects the existing resources on the map. The system then provides to the user available routes to follow to reach specific assembly points on the map.
Assembly Points DSS	AI-supported algorithm, guiding the population away from the fire and smoke to: i) the local sports stadium gathering point, ii) follow certain routes to get away by themselves

2.5 EQUIPMENT

KEMEA, as the organisation hosting TTX, is responsible for providing the required equipment and logistic support for an efficient and successful implementation of the exercise and its related activities. The following indicative equipment will be used:

Table 5: KEMEA equipment to be provided for the purpose of the TTX implementation.

Equipment	Description
KEMEA Conference room	The large conference room of KEMEA has the capacity to host a large number of people (approximately 200) for the organisation of events, workshops, exercises etc. For the PANTHEON TTX arrangements for at least 50 people will be made with desks, chairs and a roundtable if required.
Laptop	A laptop will be provided for the purposes of the TTX. The SCDT system will be uploaded and the system operator will have the capability to use the laptop and utilize the system.
Projector	A projector will be provided in order to display the SCDT system and its components to the audience (players, observers and evaluators).
Internet connection	Both Wi-Fi and Ethernet lines will be provided for internet connection in the conference hall.
Other equipment	Other equipment including microphones, pointers, chargers etc. will be provided for the participants of the TTX.

2.6 DETAILED AGENDA

The main steps of the TTX are described below:

1. Welcome and introduction
2. Brief presentation of the project
3. Presentation of the SCDT system and its components and short training session
4. Run Use Case 1, Planning – Earthquake
5. Run Use Case 2, Training – Wildfire
6. Evaluation of the TTX
7. Termination of the TTX

The agenda is presented in Annex 1. A detailed timeline and description of each of the TTX parts is included in the following subchapter.

2.6.1 DETAILED TIMELINE AND DESCRIPTION OF THE TTX STEPS

On the 16th of September 2025 the timeline of the TTX will be as follows:

1. Registration, welcome and introduction to the Athens TTX (Duration: 45 minutes, 09:30 – 10:15 EEST).
    a. Participants' arrival at the conference room of KEMEA and registration.
    b. The TTX coordinator (HPOL) and host (KEMEA) welcome the TTX participants. Welcoming is accompanied by a short roundtable for the presentation of the participating organisations.
    c. The HPOL and KEMEA will make an introduction to the event and present its scope and objectives.
2. Presentation of the PANTHEON project and its objectives (Duration: 15 minutes, 10:15 – 10:30 EEST)
    a. The project coordinator (THL) takes the floor from the TTX coordinator and host and makes a brief introduction and description of the project, addressing mainly external participants, and provides information regarding the current status of the project and its research and technical outcomes.
3. Presentation of the SCDT system (Duration: 60 minutes, 10:30 – 11:30 EEST)
    a. The project coordinator with assistance from technical partners, both physically present and online, will present the under development SCDT system, whereas its components will be presented by each technical developer.
    b. Short training in the use of the system and its components will be provided by the responsible partner (ISPC), in order to facilitate and familiarise players (HPOL) with its functionalities.
4. Coffee break (Duration: 15 minutes, 11:30 – 11:45 EEST)
5. Run Use Case 1, Planning – Earthquake (Duration: 120 minutes, 11:45 – 13:45 EEST)
    a. Introduction to the first Use Case of the TTX, presentation of the scenario and expectations from the participants (90 minutes, 11:45 – 13:15 EEST).
        i. The scenario of the first Use Case, i.e., the occurrence of a strong earthquake at the NW of Athens, is presented by KEMEA to the participants.
        ii. The HPOL trainer follows the scenario step by step and operates the corresponding components of the SCDT system.
        iii. Discussions between the trainer and the trainees are being held regarding the SCDT system, its components and their operational value in managing earthquake emergencies.
        iv. Other participants (Consortium partners as well as external first responders acting as observers in the TTX) take notes and monitor the whole process. However, observers do not interfere during exercise conduct.
    b. A hot-wash debriefing takes place with the aim of summarising the main outcomes from the first Use Case, documenting and discussing participants' first impressions and viewpoints. Evaluators take notes of discussions, to be used for the After-Action Report (30 minutes. 13:15 – 13:45 EEST).
6. Lunch break (Duration: 60 minutes, 13:45 – 14:45 EEST)
7. Run Use Case 2, Training – Wildfire (Duration: 120 minutes, 14:45 – 16:45 EEST)
    a. Introduction to the second Use Case of the TTX, presentation of the scenario and expectations from the participants (90 minutes, 14:45 – 16:15 EEST).

i. The scenario of the first Use Case, i.e., the ignition of a wildfire near the town of Fyli, at the NW of Athens, is presented by KEMEA to the participants.
ii. The HPOL trainer follows the scenario step by step and operates the corresponding components of the SCDT system.
iii. Discussions between the trainer and the trainees are being held regarding the SCDT system, its components and their operational value in managing earthquake emergencies.
iv. Other participants (Consortium partners as well as external first responders acting as observers in the TTX) take notes and monitor the whole process. However, observers do not interfere during the exercise conduct.

b. A hot-wash debriefing takes place with the aim of summarising the main outcomes from the second Use Case, documenting and discussing participants' first impressions and viewpoints. Evaluators take notes of discussions, to be used for the After-Action Report (30 minutes, 16:15 – 16:45 EEST).

On the 16th of September 2025 the timeline of the TTX will be as follows:

1. Evaluation of the TTX (Duration: 120 minutes, 10:00 – 12:00 EEST)
   a. A questionnaire related to the validation of the SCDT system by the participants' viewpoint as well as to the evaluation of the whole TTX event is distributed by the TTX coordinator and host and is directly filled in by the participants. The outcomes of the evaluation questionnaire will be analysed and presented in D8.6 "Pilots' outcomes and recommendations".

2.7 HOT-WASH DEBRIEFING

At the end of each Use Case, the hot wash debriefing follows, which comprises the first step of the evaluation that will be conducted at the end of the TTX. The hot-wash debriefing serves as a documentation of the participants' first impressions and contains questions related to the achievement of the Use Case objectives, initial thoughts regarding the SCDT system and the added value it brings, not only to the HPOL but also to other first responders' organisations, for the management of earthquake and wildfire emergencies. The exercise coordinator (HPOL) and host (KEMEA) will undertake the debriefing of Use Case 1 and Use Case 2, respectively.

2.8 END USER VALIDATION QUESTIONNAIRES

As part of the end-user validation process for the PANTHEON pilots, structured questionnaires will be administered to assess how end-users interact with the system. These questionnaires are designed to capture key aspects of user experience, including usability, clarity, trust and decision-support effectiveness. The surveys include validated instruments, such as the System Usability Scale (SUS), as well as custom items tailored to specific functionalities and components of the platform. Questions focus on the intuitiveness of the interface under pressure, the clarity of critical information e.g., cascading risks and infrastructure interdependencies, and the ability of the platform to support rapid and informed decision-making. Additional items assess user trust in the platform's recommendations and overall satisfaction.

Questionnaires are tailored to different roles, with more detailed versions for system operators and primary end-users (HPOL and JOAFG personnel who act as players) and more general versions for observers and evaluators. Each pilot scenario is accompanied by a customised version of the questionnaire to reflect the

particular system components tested. To ensure accessibility, surveys are translated into Greek for the Greek pilot. Demographic information such as age, gender, education level, area of expertise and years of experience are also collected to contextualise the responses. Open-ended questions are included to capture user suggestions and requirements for improvement.

These end-user questionnaires gather essential quantitative and qualitative insights into the user-centred performance of the PANTHEON platform and help guide further development. Details regarding the evaluation process are included in the Deliverable 8.6 “Pilots’ outcomes and recommendations”.

3. SCENARIOS

In this chapter the two scenarios selected for the Athens TTX are briefly described. A step-by-step evolution of the emergency is presented with the inclusion of the operational deployment of the Hellenic Police. Details regarding the scenarios, apart from the scenario flow, are included in D8.2 "Reports of Pilots' operation scenarios".

3.1 USE CASE 1, PLANNING – EARTHQUAKE

The scenario pertains to a single event (earthquake) and covers one day of operational planning.

Potential players to be included in the scenario: Athens Police staff – traffic police-other police operational units

A detailed flow of the planning scenario can be seen below:

a) A strong earthquake occurs on 9 of September at 3 am within the Region of Attica, a few km NW of Athens. The earthquake is strongly felt throughout the Region of Attica as well as in the northeastern parts of the Region of the Peloponnese, southeastern parts of the Region of Central Greece, parts of the Euboea Island and the northwestern Cyclades islands.

b) At 03:05 am, the Geodynamic Institute of the National Observatory of Athens (GEIN-NOA) announces the characteristics of the earthquake. The coordinates of the epicenter are 38.08 N (north) and 23.60 E (east), the magnitude is 6.3 R and the focal depth of the earthquake is 9.5 km. The earthquake was caused by an active fault at the southwestern slopes of the Parnitha mountain. The earthquake is strong and shallow (low focal depth); therefore, it leads to severe damage and generates unexpected secondary events of strong impact (cascading effects). Landslides are observed and lead to the blocking of the road that leads to the military base at the peak of Parnitha mountain. Ground deformations are observed mainly in the western parts of the Region and lead to damage in the railway. Several critical infrastructures are affected by the seismic event including the sector of energy, with natural gas stations and pipelines damaged, the transportation sector, with the railway being more severely affected, telecommunications disruption and power shortages at a radius of 40 km around the epicentre.

c) At 03:08 am, the GEIN-NOA announces the epicentre and magnitude to the Earthquake Planning and Protection Organisation (EPPO-ITSAK) and to the Ministry for Climate Crisis and Civil Protection.

d) At 03:15 am, reports regarding collapsed and heavily damaged buildings are received by the 112-emergency call center, which then dispatches the relevant information to all engaged first responders' organizations.

e) Simultaneously reports regarding injuries and potential casualties are received by the 166-emergency call center, which then dispatches the relevant information to all engaged first aid responders' organisations

f) Concurrently, reports regarding accidents and perhaps injuries and potential casualties on local streets and avenues and injuries are received by the 100-police call center, which then dispatches the relevant information to all engaged police units and other first responders' organizations

g) Upon reception of reports regarding injured or stranded individuals, local police units are dispatched and start gathering the first situational picture (damage, victims, collapses) across their area of responsibility. All mobile police units act as the official source for the initial impact estimate that feeds the national coordination chain i.e., the info gathered by the police is utilised by other organisations involved in the State's response to the disaster.

h) Police officers in the field report their first findings to the Police operation centre and this info is also reported to the Civil Protection operation centre so that mobilisation efforts can scale correctly.

i) Police units establish perimeters around dangerous structures, prevent crowding thus making sure that no crowds are gathered in the area, so that Fire Service rescue teams and ambulances can work safely to evacuate individuals and transfer them to the nearest hospital, as needed.

j) Traffic Police imposes temporary road closures and restrictions to create emergency corridors, reroute flows and keep the road network clear for rescue and medical transport. Also, traffic police ensures that certain routes remain available for people who need to evacuate the area.

k) Police routinely issues announcements and press releases either through social media, the police website or other available media (TV, radio etc.) to inform the public about road conditions, potential road closures etc. as the situation evolves.

l) At 03:30 authorities decide an organised preventive evacuation. Police is responsible to:
   - notify residents,
   - enforce the evacuation decision by dispatching mobile units in the affected areas,
   - regulate traffic along evacuation routes, and
   - prevent crimes against evacuated property by mobilising patrol units accordingly.

   The goal of these patrols is to deter looting, protect closed-off areas and safeguard affected critical infrastructures.

m) At the same time, Police mobile units assist EMS access/escorts, if necessary.

n) Also, Police uses drones to overfly affected zones and provide real-time information in the mobile units regarding the situation on the ground.

o) In case of casualties, police dispatches its DVI (Disaster Victim Identification) unit to assist in the identification of the deceased, following the relevant legislative and operational protocols.

p) When the situation winds down, traffic measures are gradually lifted and the role of the Police mainly focuses on the recovery phase operations, namely guarding red-tagged buildings, supporting other State services in recording the damages etc.

3.2 USE CASE 2, TRAINING - WILDFIRE

The scenario pertains to a single event (wildfire) and covers one day of training.

a) On the 15th of September 2025 at 15:00 the 112-emergency call centre receives information from trekkers on Mt. Parnitha that there is grey smoke near St. Cyprianous Monastery at Northwestern Athens. The wildfire affects a sparsely forested area, which is mainly vegetated with bushes and low vegetation in general. However, due to strong NNE wind that prevail in the area the Wildland Urban Interface (WUI) area of Fyli is directly threatened.

b) At 15:05 am, reports from citizens nearby regarding observed smoke are received by the 112-emergency call center, which then dispatches the relevant information to Fire service and other related engaged first responders' organizations.

c) At 15:10, residents in the Wildland Urban Interface (WUI) of Fyli start calling the 199-fire emergency call centre for possible occurrence of wildfire. Although the fire does not burn densely forested areas, due to strong NE (northeastern) winds, it threatens the WUI area of Fyli town nearby critical infrastructures and entities.

d) Simultaneously, at 15:15 reports regarding smoke and flames are also received by the 100-emergency call center,

e) Guided by info received by the police dispatcher and/or drone units, traffic Police imposes road closures, diversions and priority lanes so fire engines and other responders can move unobstructed.

f) Police patrol units regulate access to the area affected by the fire and maintain order around operations so that firefighting and evacuation operations can proceed safely – hustlers, selfie-seekers and other individuals are prevented from approaching the area.

g) At 15:55 an evacuation is ordered (note: evacuation can be decided either by the local mayor or the General Secretariat of Civil Protection and communicated to the public through the 112 system) and the Police plays a major role in its execution. Specifically, it carries out route control, door-to-door notifications as directed, it assists people moving to assembly points and also makes sure that evacuation routes are kept clear. The formal decision process and roles are set out in the national evacuation guidelines.

h) At the same time, police mobile units are deployed in the affected/evacuated area to make sure that evacuated neighbourhoods stay safe, to deter looting and guard threatened or damaged property until it is handed back to owners.

i) Police mobile units – including traffic police maintain traffic control during the wildfire to secure that EMS (including fire trucks) can reach the affected area, shelters or hospitals without delay.

j) When the fire is contained and eventually extinguished, around 22:25, police gradually re-opens roads and removes police cordons used to facilitate emergency operations, in close coordination with the Fire Service and the local authorities, thus transitioning from emergency traffic control to normal conditions.

4. EVALUATION AND ANALYSIS

This chapter is dedicated to the evaluation of the Athens TTX. A description of the methodologies utilised to collect data in the TTX, the persons comprising the evaluation and KPIs teams, as well as a brief description of how the evaluation analysis will be conducted are included, although, for the latter, details will be provided in the Deliverable 8.6 "Pilots' outcomes and recommendations".

4.1 KPI TEAM

The following table presents the KPI team members. KPIs have been developed for each component of the SCDT and have been proposed by Consortium partners including PANTHEON first responders' organisations (HPOL and JOAFG). The role of the KPI team members is to monitor whether, throughout the TTX execution, the predefined KPIs have been achieved or not.

Table 6: KPI team members

Full Name	Affiliation
Benjamin Schuster	JOAFG
Daniela Weismeier-Sammer	
Ilona Grabmaier	
Fanourios Fakoukakis	FINT
Jim Sharples	ENAC
Mike Karamousadakis	THL
Sotiris Nakos	INTEROPT
Thanos Kyritsis	
Iacob Crucianu	SIMAVI
Otilia Bularca	

4.2 DATA COLLECTION PLAN

The data collection plan includes the following means:

- Evaluation questionnaires, with different versions for the players, evaluators and observers of the TTX;
- Written notes deriving from the live discussions that will take place during the exercise, as well as right after it (hot-wash debrief),
- Registration forms,
- Audiovisual material from video recordings of the TTX,
- Registration forms;
- Other notes and inputs from the TTX host, coordinator and participants.

4.3 EVALUATION TEAM

The following table presents the names, surnames, affiliations and roles of the evaluation team of the TTX.

Name	Surname	Affiliation	Role
John	Tsaloukidis	KEMEA	Lead evaluator / Host
Nikolaos	Kalapodis	KEMEA	Lead evaluator / Host
Georgios	Sakkas	KEMEA	Evaluator / Host
Danai	Kazantzidou Firtinidou	KEMEA	Evaluator / Host
Areti	Plessa	Independent Civil Protection Directorate of the Region of Attica	Evaluator / UAB member

4.4 EVALUATION ANALYSIS

In the review and analysis phase, all the feedback from TTX participants will be collected and compiled. As described in sections 4.2 and 4.3, for each project TTX, there will be a designated data collection team responsible for handing out, collecting and processing all the necessary forms. This team will make sure that all the forms will be filled. Both quantitative and qualitative data will be processed and analysed. Strengths, weaknesses and opportunities for system improvement will be identified and an After-Action Report (AAR) will be developed, which includes validated KPIs, user feedback, and improvement recommendations.

The analysis phase will be initiated immediately following the TTX, running from mid-September to mid-November 2025. This phase will focus on systematically reviewing and interpreting the data gathered throughout the TTX sessions, which will be conducted in both Athens and Vienna. The primary goal of the PANTHEON TTX is to evaluate the system itself (usability, technical reliability and practical integration into disaster management workflows). The emphasis will be on how effectively the system functions in simulated emergency conditions and how well it supports key decision-making and resource allocation processes, rather than on participants' individual performance.

All feedback collected from participants i.e., observers, players (system operators) and evaluators will be consolidated during this phase. Dedicated evaluation teams for each TTX ensures that all relevant forms (surveys, checklists, observer notes, audio and video recordings and debrief summaries) are properly distributed, completed and returned to the lead evaluators. These teams will also be responsible for compiling and preparing the data for analysis.

Both quantitative metrics e.g., system response times and completion of KPIs and qualitative insights e.g., user satisfaction, integration challenges, perceived usefulness will be analysed. This mixed-methods approach enables a thorough understanding of the current strengths of the system and areas for improvement. Input will be drawn from structured feedback forms, open comments, interviews and debrief discussions. Where appropriate, statistical analysis will be applied, though qualitative interpretation will also play a significant role, particularly where user experience and operational integration are concerned. The evaluation findings will feed into an After-Action Report (D8.6 "Report on pilots' outcomes and recommendations"). This report will include a synthesis of validated KPIs, key user feedback, and actionable recommendations for further platform refinement and broader adoption.

Finally, given the varied contexts of the two pilot sites, analysis will be performed independently for Athens and Vienna, allowing for context-specific conclusions while identifying patterns applicable across both scenarios.

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ANNEX

ANNEX 1 - AGENDA

<table>
<tr><th colspan="3">PANTHEON Tabletop Exercise, Athens, 16-17/09/2025</th></tr>
<tr><td>Research Innovation Action (RIA)</td><td>PANTHEON

“Community-Based Smart City Digital Twin Platform for Optimised Disaster Risk Management operations and Enhanced Community Disaster Resilience”</td><td>This project has received funding from the European Union’s Horizon Europe programme under Grant Agreement N°101074008.</td></tr>
<tr><td>Start – End Date</td><td colspan="2">01/01/2023 – 31/12/2025</td></tr>
<tr><td rowspan="2">Meeting</td><td>Venue Location: Premises of the Center for Security Studies (KE.ME.A.), 4, P. Kanellopoulou str., Athens GR-10177, Greece.
Link for online attendance:</td><td rowspan="2">Date & Time:
16th of September 2025, 09:30 – 16:45 EEST
17th of September 2025, 10:00 – 12:00 EEST.</td></tr>
<tr><td>Contact Persons:
Exercise Coordinator (HPOL): Nikolaos Petropoulos, npetropoulos@astynomia.gr

Exercise Host (KEMEA): John Tsaloukidis, j.tsaloukidis@kemea-research.gr
Nikolaos Kalapodis, n.kalapodis@kemea-research.gr

Project Coordinator (THL): Anna Tsabanakis, anna.tsampanaki@thlabs.eu
Mike Karamousadakis, michail.karamousadakis@thlabs.eu</td></tr>
</table>

Daily Program – Tuesday, 16th of September 2025

Time	Activities	Responsible partners
09:30 – 09:45	Registration	Exercise Host (John Tsaloukidis, Nikolaos Kalapodis, KEMEA)
09:45 – 10:15	Welcome, Introduction, Round table	Exercise Coordinator (Nick Petropoulos, HPOL), Exercise Host (John Tsaloukidis, Nikolaos Kalapodis, KEMEA), Other Participants
10:15 – 10:30	Presentation of the PANTHEON project and its objectives	Project Coordinator (Mike Karamousadakis, Anna Tsabanakis, THL)
10:30 – 11:30	SCDT system presentation and training	Project Coordinator (Mike Karamousadakis), Training provider (Kiril Shtefchyk Tatarchuk)
11:30 – 11:45	Coffee break	
11:45 – 12:00	Use Case 1, Scenario presentation	Exercise Coordinator (Nick Petropoulos), Exercise Host (John Tsaloukidis, Nikolaos Kalapodis, KEMEA)
12:00 – 13:15	Operation of the system, discussions between the trainer and trainees	Exercise Coordinator (Nick Petropoulos, HPOL)
13:15 – 13:45	Hot-wash debriefing, discussion amongst participants	Exercise Coordinator (Nick Petropoulos, HPOL), Exercise Host (John Tsaloukidis, Nikolaos Kalapodis, KEMEA)
13:45 – 14:45	Lunch Break	
14:45 – 15:00	Use Case 2, Scenario presentation	Exercise Host (John Tsaloukidis, Nikolaos Kalapodis, KEMEA)
15:00 – 16:15	Operation of the system, discussions between the trainer and trainees	Exercise Coordinator (Nick Petropoulos, HPOL)
16:15 – 16:45	Hot-wash debriefing, discussion amongst participants	Exercise Coordinator (Nick Petropoulos, HPOL), Exercise Host (John Tsaloukidis, Nikolaos Kalapodis, KEMEA)
End of Day 1		

Daily Program – Wednesday, 17th of September 2025

Time	Activities	Responsible partners
10:00 – 10:15	Registration	Exercise Host (John Tsaloukidis, Nikolaos Kalapodis, KEMEA)
10:15 – 12:00	Evaluation of the TTX	Evaluation Leader (Ben Schuster, JOAFG colleague)
End of Day 2		

ANNEX 2 – INFORMED CONSENT FOR PARTICIPATION IN THE TTX

Project: PANTHEON Community-Based Smart City Digital Twin Platform for Optimised Disaster Risk Management operations and Enhanced Community Disaster Resilience

Topic: Approach for Building Disaster Resilient Communities

Participant consent form

Before we start with the study, we would like to inform you about the data processing and ask for your consent. You need not worry about privacy as we will not share the information we have gathered from this study other than statistical and non-identifiable personal information in the report. Please tick the following:

- ☐ I am aware of the main aspects of the participation for the above PANTHEON project.
- ☐ I confirm that I have had the opportunity to ask questions.
- ☐ I understand that my participation is voluntary.
- ☐ I understand that my answers to any questionnaire will remain anonymous.
- ☐ I understand that if I don't wish to answer any particular questions, I am free to decline.
- ☐ I give permission for members of the research team to have access to my anonymised responses. I understand that my name will not be linked with the research materials, and I will not be identified of identifiable in the outputs that result from the research without my agreement.
- ☐ I agree to take part in the above mentioned activity, the sole purpose of which is research.
- ☐ I give my consent to audio and video footage
- ☐ I give my consent for my contact details to be shared with the members of the research team for the purpose of receiving information and communications relating to the PANTHEON project.
- ☐ I understand, that I can revoke my consent at any time with effect for the future, whereby the lawfulness of the processing carried out on the basis of the consent until revocation is not affected. A revocation has the consequence that my data will no longer be processed for the above-mentioned purposes from that point on.

- ☐ I hereby confirm that I have read and understood this declaration of consent and that my questions were addressed properly.

Location and date:

……

Name of the participant: Signature of the participant:

…… ……

This form should be signed and dated. A copy should be saved by the participant and one for the project documentation.

Project information

The EU-funded project PANTHEON has designed and developed a Community based Digital Ecosystem for Disaster Resilience. In more detail, the aim was to improve risk assessment, reduce vulnerability, and strengthen community disaster resilience. Part of this is the enhancement of operational capabilities of Community Based Disaster Resilient Management (CBDRM) teams. To this end, it will use Smart City Digital Twin (SCDT) technology and leverage new and emerging technologies and innovations with two main purposes: (1) training through simulations to improve decision-making in resource deployment and (2) operational resource planning in order to optimise the available resources. For the specific developments in the project, our research focuses on Greece (Athens) and Austria (Vienna) as pilot regions. Input from other areas will also be welcome to broaden the scope.

The aim of this pilot is to evaluate the PANTHEON system, i.e. the technology developed within the project. Specifically, the evaluation will focus on how users experience the product under test. As a potential end-user, you will be invited to use the product to complete a series of tasks or exercises while thinking aloud. You will be asked to provide further information about your experience with the product during and after the exercise.

Methods: Conduction of questionnaires, interviews, observations, focus groups and post-exercise debriefing sessions to gather end users' insights, perceptions and opinions about the product, in order to test and validate it, and to offer recommendations for potential improvements. The think-aloud method will also be used to identify areas for improvement in terms of system usability. Interview, focus group and post-exercise debriefing session recordings, as well as exercise recordings, will be transcribed and summarised using content analysis to address the evaluation's points of interest. The questionnaire data will be analysed statistically and descriptively.

Project Partners:

1 TWI ELLAS ASTIKI MI KERDOSKOPIKI ETAIREIA (Greece)
2 AIRBUS DEFENCE AND SPACE SAS (France)
3 M3 SYSTEMS BELGIUM (Belgium)
4 SOFTWARE IMAGINATION & VISION SRL (Romania)
5 Mobility Ion Technologies SL (Spain)
6 FUTURE INTELLIGENCE EREVNA TILEPIKINONIAKON KE PLIROFORIAKON SYSTIMATON EPE (Greece)
7 ECOLE NATIONALE DE L AVIATION CIVILE (France)
8 UNIVERSITAT POLITECNICA DE CATALUNYA (Spain)
9 PRACTIN IKE (Greece)
10 ISEM-INSTITUT PRE MEDZINARODNU BEZPECNOST A KRIZOVE RIADENIE, NO (Slovakia)
11 INTEROPTICS S.A. (Greece)
12 JOHANNITER OSTERREICH AUSBILDUNG UND FORSCHUNG GEMEINNUTZIGE GMBH (Austria)
13 EPSILON MALTA LIMITED (Malta)
14 INSTITUT DE SEGURETAT PUBLICA DE CATALUNYA (Spain)
15 HELLENIC POLICE (Greece)
16 KENTRO MELETON ASFALEIAS (Greece)
17 Crisis Management State Academy (Armenia)

Information about generated data

Processing of data and data protection

All data collected in the course of the interview will be treated confidentially and will only be viewed or processed by the project-involved employees of KE.ME.A, that stores the collected data material (in the role of data processor according to GDPR) and works with the data material (in the role of data controller according to GDPR). Information that could lead to an identification of the person will be changed (anonymization) or removed. In scientific publications, the data is post-processed accordingly, so that the resulting overall context of events cannot lead to an identification of the person by third parties. The results will be further processed in the form of a report and possibly further scientific publications.

The data will be processed on the basis of your consent for the purpose of carrying out the above-mentioned research project (collection, evaluation, generation of results, publications). The legal basis for this is the EU General Data Protection Regulation (GDPR), in particular Art 6(1)(a) (consent) in conjunction with the Austrian Research Organization Act (FOG). Your personal data (name, contact, age, gender, duration in working area, role in disaster management, allocation of organisation and information about the disaster management plan) will be encrypted and stored for up to 10 years after the end of the project period (i.e. until 31.12.2032) and then deleted. The collected interview ("raw data") will be kept for 10 years from the date of publication of the results of the project to demonstrate compliance with good scientific practice and then destroyed. Data required for the assertion, exercise and defence of legal claims will be stored for up to 30 years and subsequently deleted. You have the right to information, correction, deletion, restriction of processing, data portability, objection, and a right of appeal to the data protection authority at any time in accordance with legal provisions (in particular Art 15 to 22 DSGVO with the restrictions in § 2d paragraph 6 FOG).

Voluntary nature of participation

Participation in this study is voluntary. Participants may withdraw at any time without giving reasons and without incurring any disadvantages. For this purpose, please keep this document with the contact: dpo@pantheon.eu

Confidentiality and anonymity

Your information will be used solely by researchers for research purposes in the context of the above research project. Personal information will not be shared with anyone outside the research team of this project. The published research results (publications, research reports) have no personal reference and therefore do not allow any conclusions to be drawn about your identity.

Right of withdrawal

In order to be able to fulfil your right of withdrawal and to enable assignment of the correct record for this purpose, we urgently recommend to save this informed consent with the following contact address, to be able to contact us: Cristina Barrado dpo@pantheon.eu or Anna Tsabanakis info@pantheon.eu