Safe Cities

SAFE-CITIES
**Risk-based Approach for the Protection
of Public Spaces in European CITIES**

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Terrorism in the EU: Threat Picture
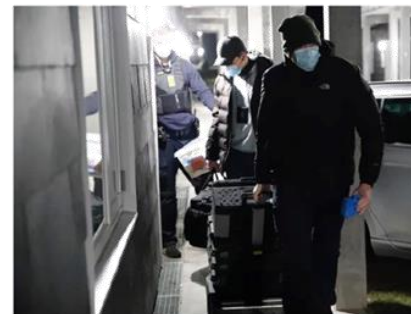
Reading, UK – 20 June 2020 - stabbing

Nice, FR – 29 October 2020 - stabbing

Vienna, AT – 2 Nov 2020 - shooting

Hagen, DE – 16 Sept 2021 – Foiled synagogue terrorist attack

February 2021 - DK/DE - CT police operation to arrest 14 people of a terrorist group who had procured bomb-making material

European Commission

Increasing challenges are faced by cities in mitigating security risks.

State of the Art

Safety plans

Tabletop

Apps

Novel approaches are needed for enhancing urban security.

SAFE-CITIES

Risk-based Approach for the Protection of Public Spaces in European CITIES

Security Vulnerability Assessment framework enabled by **Modelling & Simulation platform** supporting:

- **Scenario** building

- **Threat** and **crowd simulation**

- Urban space **design** and **retrofitting**

- **Planning** and **training**

- Advanced **analytics**

Important Facts
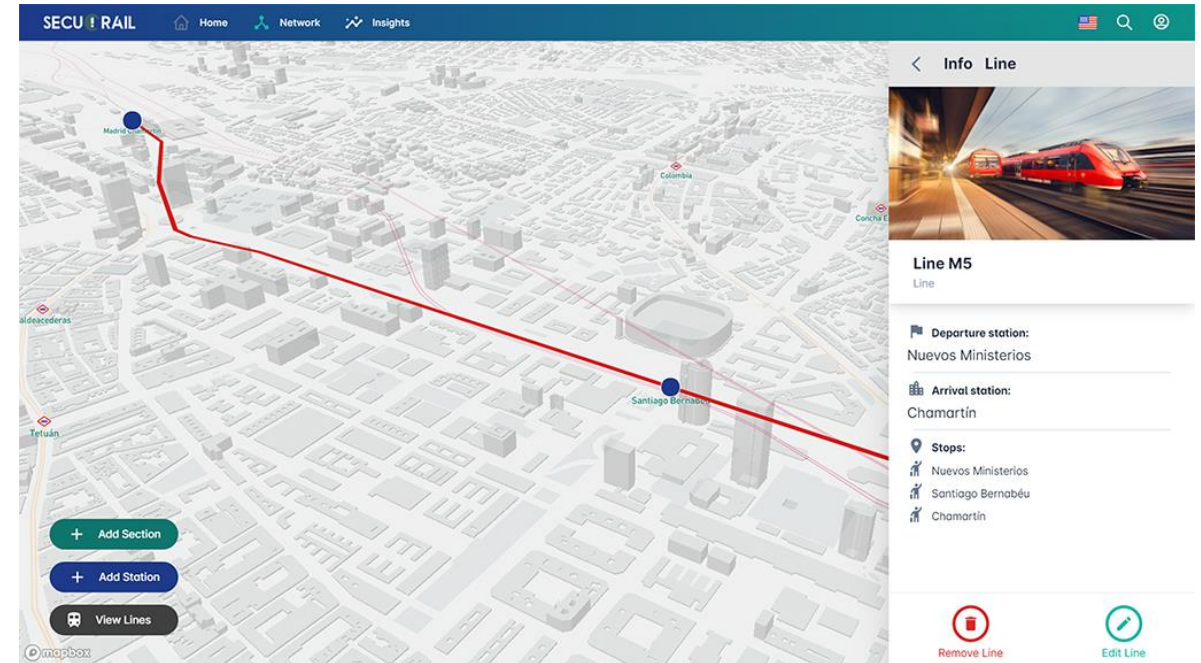
Call: HORIZON-CL3-2021-FCT-01: Fighting Crime and Terrorism

Topic: HORIZON-CL3-2021-FCT-01-07: Improved preparedness on attacks to public spaces

Project total cost: 3,342,123.75 €

Funding: 2,752,617.50 €

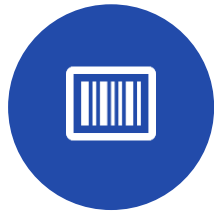**Start date**: 1 November 2022

Duration: 32 months

General Objectives

DEFINE

a systematic **Security and Vulnerability Assessment (SVA)** for public spaces.

DESIGN

the architecture for the **integration of modern tools** to enhance public spaces security.

SUPPORT

security planners, first responders and policy makers by providing **decision-making support** in security planning.

TEST

the **SVA and tools** in a series of workshops, trainings, exercises and demonstrations.

EXPLOIT

research results to foster the **uptake of technologies** by end-users with the foundation of a **new legal entity**.

Consortium

16 Partners
1 Affiliated Entity
9 Countries

Poliisihallitus

D-Visor B.V.

Polish Platform for Homeland Security

Provincial Police Headquarters in Gdansk

Thridium

Municipality of Nova Gorica

Ministry of the Interior

Confederation of European Security Services

IANUS Consulting Ltd

Ministry of the Interior

STAM S.r.l.

University of Bologna

Institute of International Sociology of Gorizia

Municipality of Gorizia

Università Verde di Bologna APS

Red Cross Gorizia

National Centre For Scientific Research Demokritos

4 Use-Cases

Football stadium
(Gdańsk, Poland)

Shopping mall
(Larnaca, Cyprus)

Music festival
(Meierijstad, the Netherlands)

Cross-border international events site
(Nova Gorica, Slovenia; Gorizia, Italy)

Tools
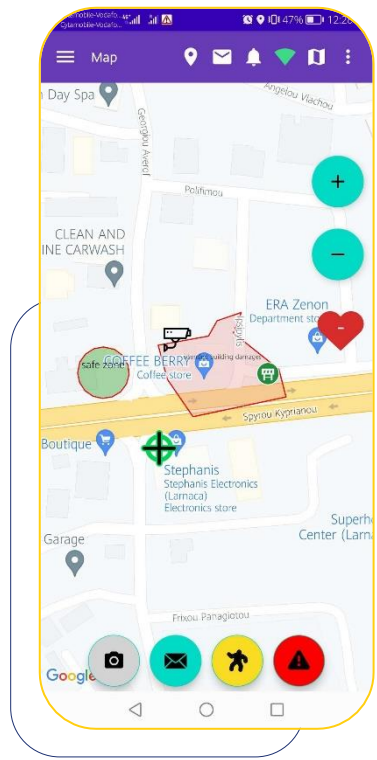
- ✓ **Digital Twin**
- ✓ **Crowd Simulation**
- ✓ **Risk Assessment Engine**
- ✓ **Detection of Efficient Pathway**
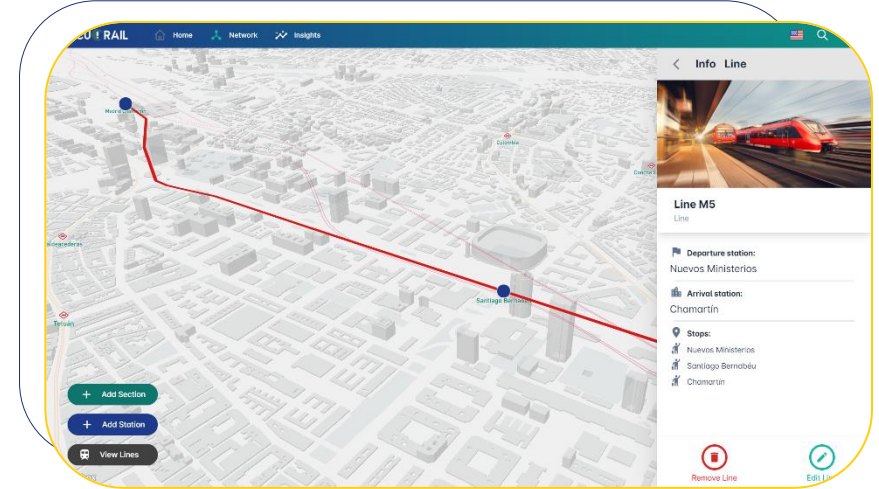
- ✓ **Dispersion of CBRN**
- ✓ **Fire in Buildings**
- ✓ **Incident Management Platform**
- ✓ **Evacuation Management Platform**

Approach

SAFE-CITIES philosophy in a nutshell
Single solution to address **all phases** of security and emergency management
Consistency across normal conditions within **urban environments** and also **mass gatherings / events**
Multi-stakeholder partnerships, across the public and private sectors
Citizens' engagement through Local Community Networks
Support "**Security-by-design**", through Crime Prevention Through Environmental Design (CPTED)
Seamlessly integrate traditional and **emerging threats** such as UAS
SVA has a **static** and a **dynamic** component, considering the space and time of the scenarios
Vulnerability considers **operational**, **technological** and **human** aspects
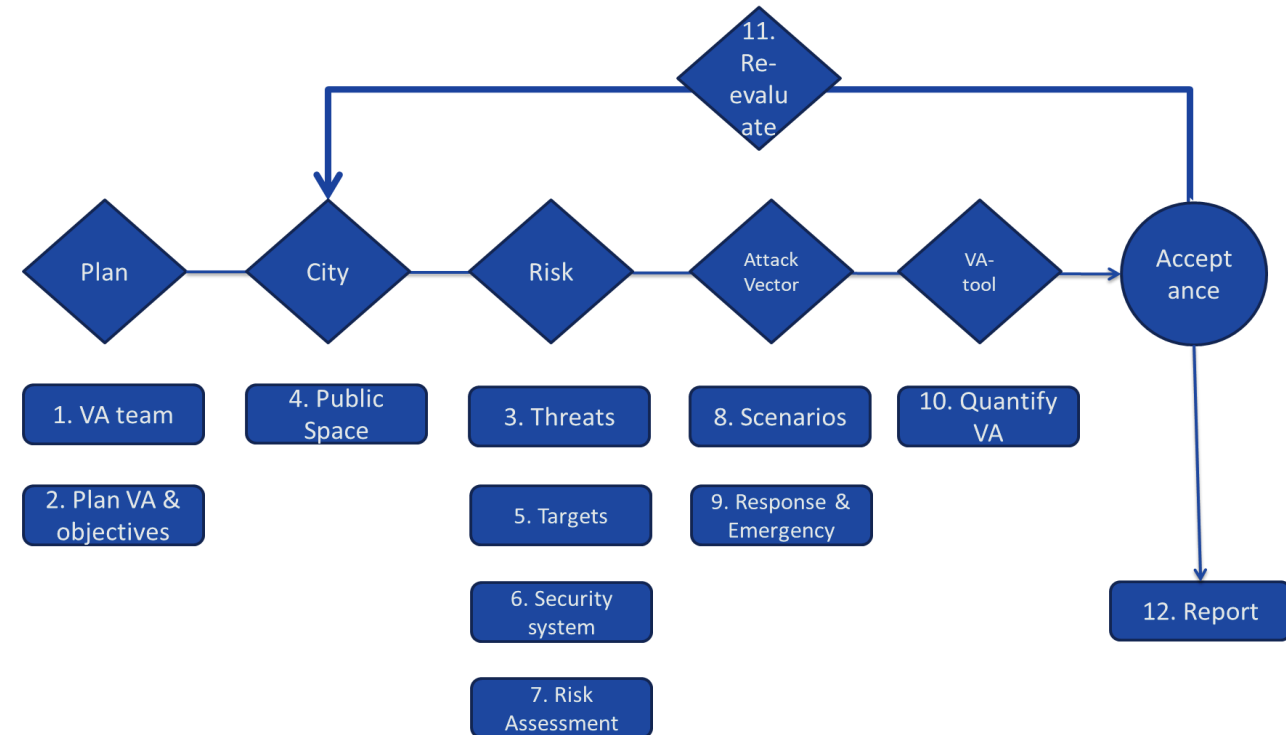
Security Vulnerability Assessment (SVA) framework

Participatory Model
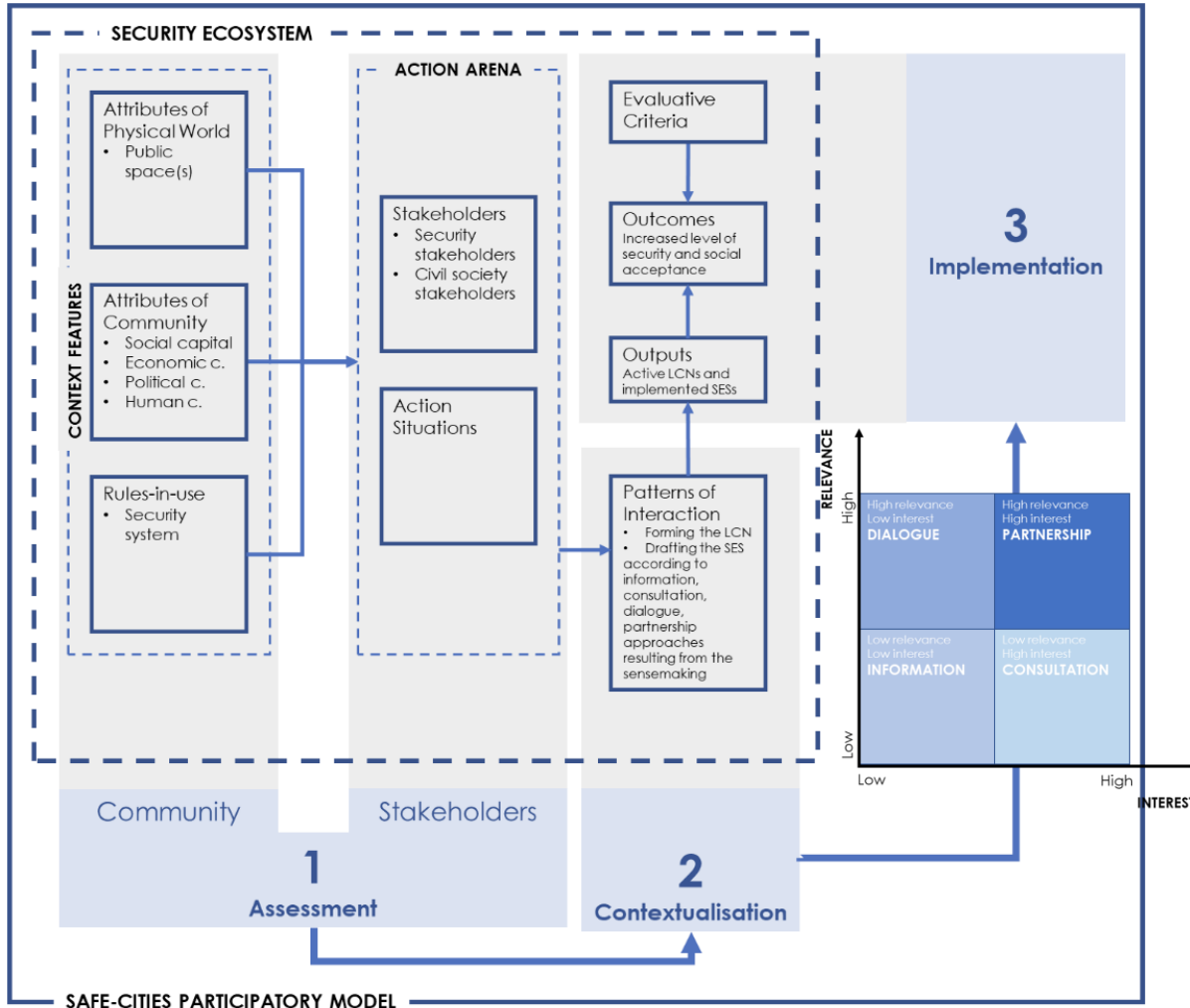
Security for whom?
Security from which threats?

- Analysis of **Security Ecosystem** components
  - Overall **context** features
  - Relevant **stakeholders**

- Set-up **Local Citizens Networks** (LCN)
  - **Participatory mechanisms/platforms** composed by identified stakeholders.

- Develop context-based **Stakeholders' Engagement Strategy** (SES) **and Action Plans**
  - Tailored to specific needs of **pilot** site
  - Supporting or preparing **application** of SAFE-CITIES solutions at local level

Security-by-design

Methodological Approach
- Avoid **oversensitivity** to risk
- Consider security measures from **early stage of design**

User's Engagement
- **Sharing** processes of safety design
- Incorporate vulnerabilities and **differences**

Physical Interventions
- **Different solutions** for different threats
- Consider **climate** and **environmental** mitigation aspects

design-for-all

design for human diversity, **social inclusion and equality.** (The European Institute for Design and Disability, 2004)

The practice of design for all makes conscious use of the **analysis of human needs and aspirations** and requires the **involvement of end users at every stage in the design process** (Persson et al. 2014)

adaptive urban design

High level of **transdisciplinary collaboration**; a design concept through which **pilot projects can test innovative, but unproven solutions** in a responsible and informed manner, with a low risk of failure.

a transdisciplinary working method, and includes **experimental design guidelines, monitoring and assessment protocols, and strategies** for including urban ecosystem services into urban development.

(Ahern et al., 2014)

security-by-design

Urban design integrating security measures into public spaces and streets **without compromising the functions or aesthetics** of the space.

(European Commission, 2022)

4 main interconnected principles: **proportionality multi-functionality stakeholder cooperation design aesthetics**

ATLAS – 4 SAFE PUBLIC SPACE DESIGN - guiding framework

Public-Private Partnerships

Where they exist, PPPs are usually part of **formal frameworks**, organized at municipality-level and of permanent nature, including mostly:

- **Points of contacts** among LEA, PSCs, and other actors (75%)

- **Regular** information **exchange** at management level (65%)

- **Live** information/data **exchange** in case of incident (55%)

Least used means of collaboration:

- **Pooling** of resources (30%)

- Joint **SVAs** (17%)

- Joint **trainings** (10%)

Reason: **Lack of trust** for data-sharing

Private security is often seen as a late-entry enforcement service. Change can only be achieved through **trust-building** and **quality control**.

SAFE-CITIES Logical View

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101073945

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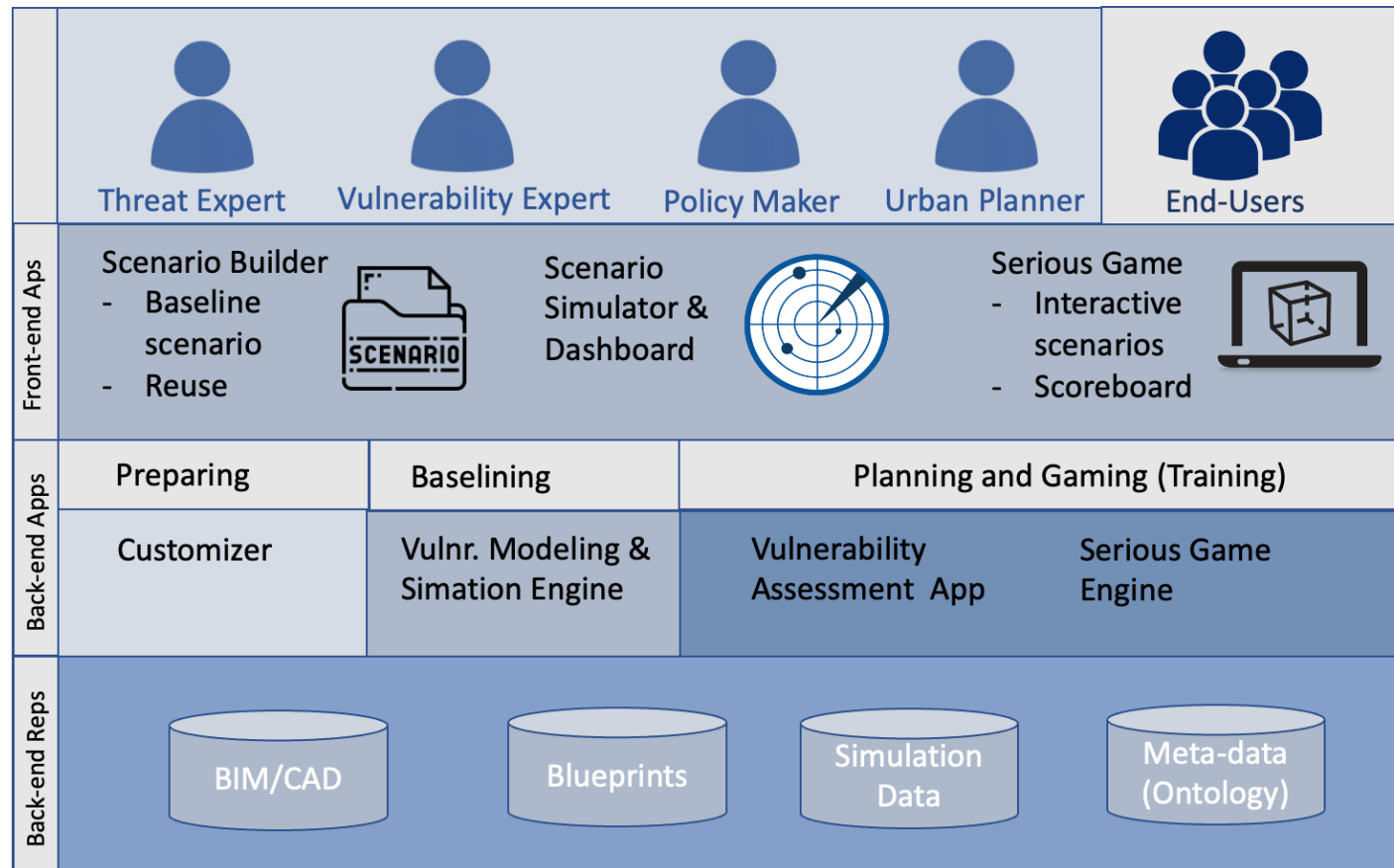
SAFE-CITIES Architecture

ML/AI workbench

Container

real-time simulation engine

Container

Scoreboard

Container

Ontology And Reasoner

Gameplay Data

Gameplay Data

Clients

CrowdAI

Cloud orchestrator ("wizard")

Server Unity App

Scenario Data

Master User

Player data

User Data

User Data Relational DB

InGame Object

Environ ment

Environment Data (Binary)

LOG

Container

Load (environment)

Load (InGame Object)

Load (environment)

Load (InGame Object)

Realtime SVA Cloud Environment

SVA Tool

1) Select **Point of Interest**
2) Mark its **area**

3) Select the **threat**

4) Answer **questions**
(e.g. threat likelihood)

5) **Results** on the map

Scenario Builder
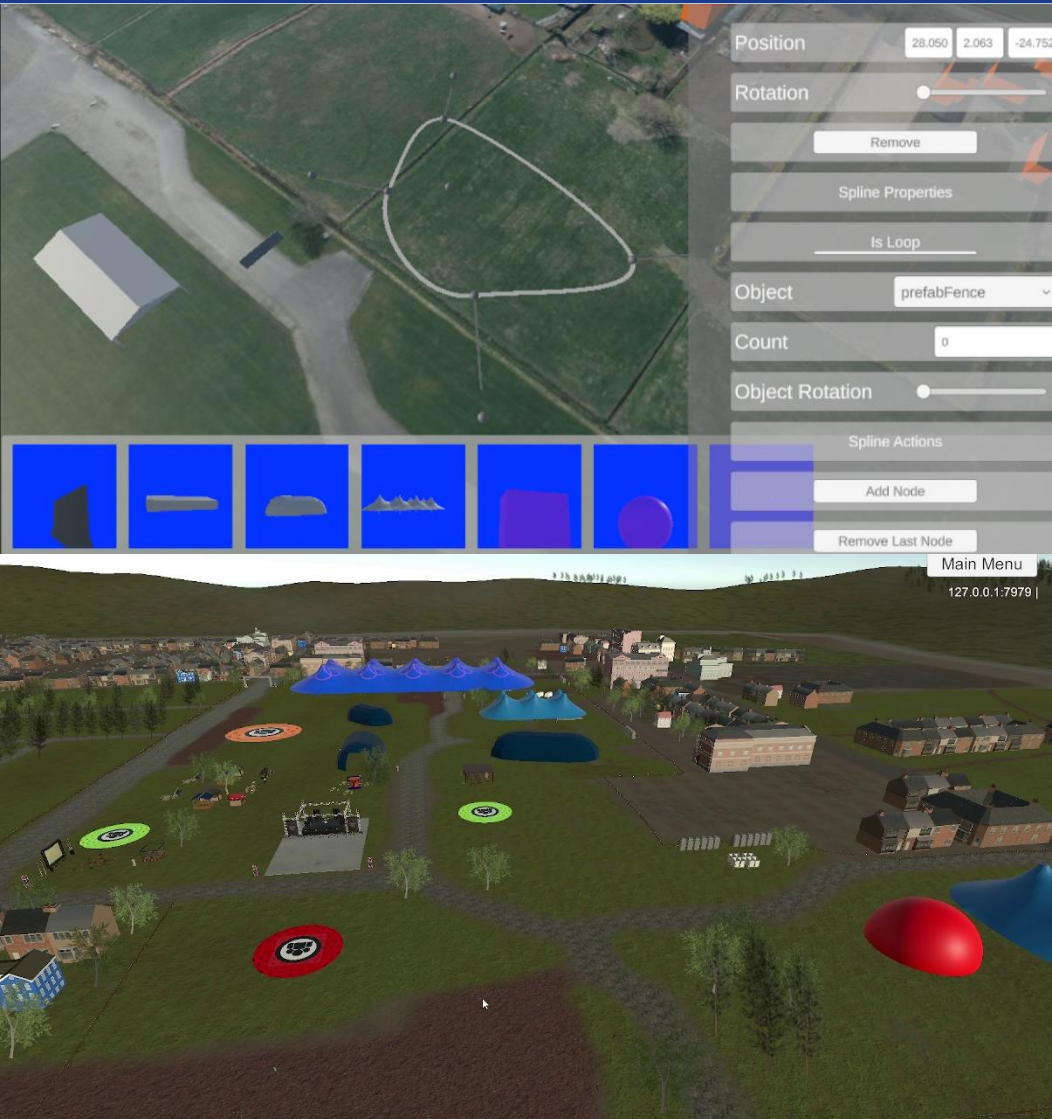
- Create **3D environment**
  - Import CAD/BIM files

- Configure **site** with blueprint objects
  - Static and dynamic elements

- Configure **threat scenario**
  - Blueprints and timelines

- Deploy as multi-player **serious game**

Serious Gaming Simulator
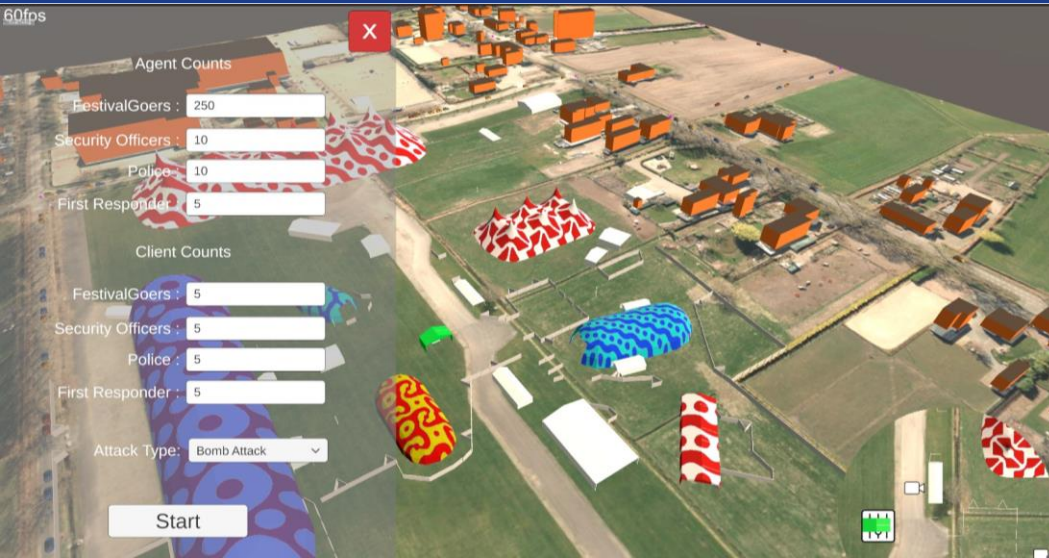
- **Multi-player** serious game
  - Multiple players and **roles** (e.g., game master, security agent, citizen, etc.)

- **Threats simulation**
  - Different and/or multiple threats

- Human and crowd **behaviours**

- **Data-driven** modelling and simulation

- **VR** immersive sessions

Dashboard & Scoreboard

STATIC SVA

Success		
Impact	82%	100%
Casualties	0	100
Injuries	0	100
Physical Damages	2,000€	20,000€
Escape Time	3:32	60 min
Discover Time	39 sec	

Static SVA
Results

Dynamic SVA
Results
(per configuration)
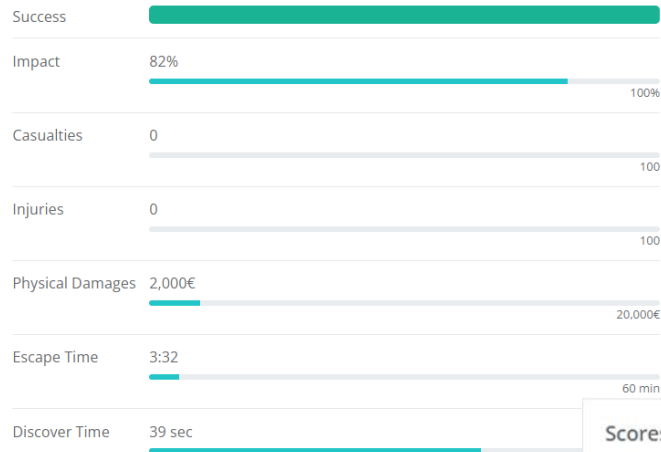
Scores

Scenario	Configuration	Run	Scores
10 buildings-100 policemen	50 cameras-50 weapons	2C_1	success : Green
10 buildings-200 policemen	100 cameras-100 weapons	2C_2	impact : 74%
15 buildings-200 policemen	150 cameras-200 weapons	2C_3	casualties : 9
		2C_4	injuries : 17
		2C_5	destroyedBuilding : 18
		2C_6	physicalDamages : 13,398€
		2C_7	escapeTimeSec : 08:32
		2C_8	discoverTimeSec : 3
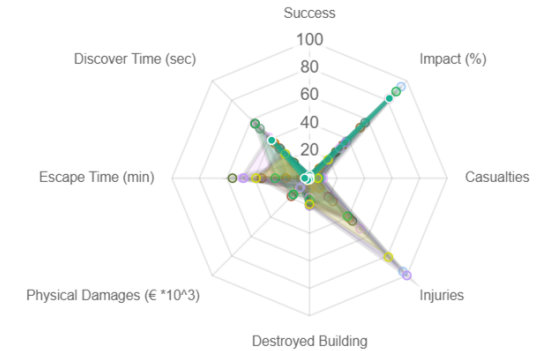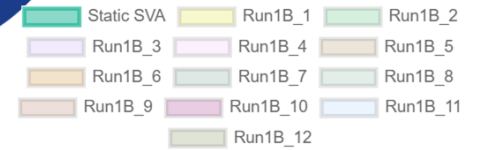
Scores

Benefits

Improved Vulnerability Assessment

by law enforcement and managers of public spaces on **countering** and/or **preventing terrorist attacks**

Enhanced training

of LEAs and first responders, in collaboration with different public and private actors, through an **interactive and engaging platform**
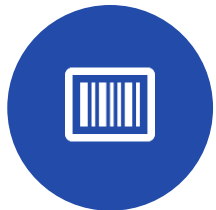
Optimized protective measures

thanks to the possibility to **simulate** attack **scenarios** and to test **different countermeasures**

Better planning

through identification of potential vulnerabilities connected to **design**, **refurbishment**, **construction**, **improvement** of public spaces

Timeline & Next Steps

April 2023
SVA framework definition

May 2024
Demonstration of SAFE-CITIES platform Alpha version

June 2025
SAFE-CITIES Start-up

November 2022
Kick-off of SAFE-CITIES

October 2023
SVA framework validation

April 2025
Final demonstration of SAFE-CITIES platform Beta version

June 2025
Completion of SAFE-CITIES
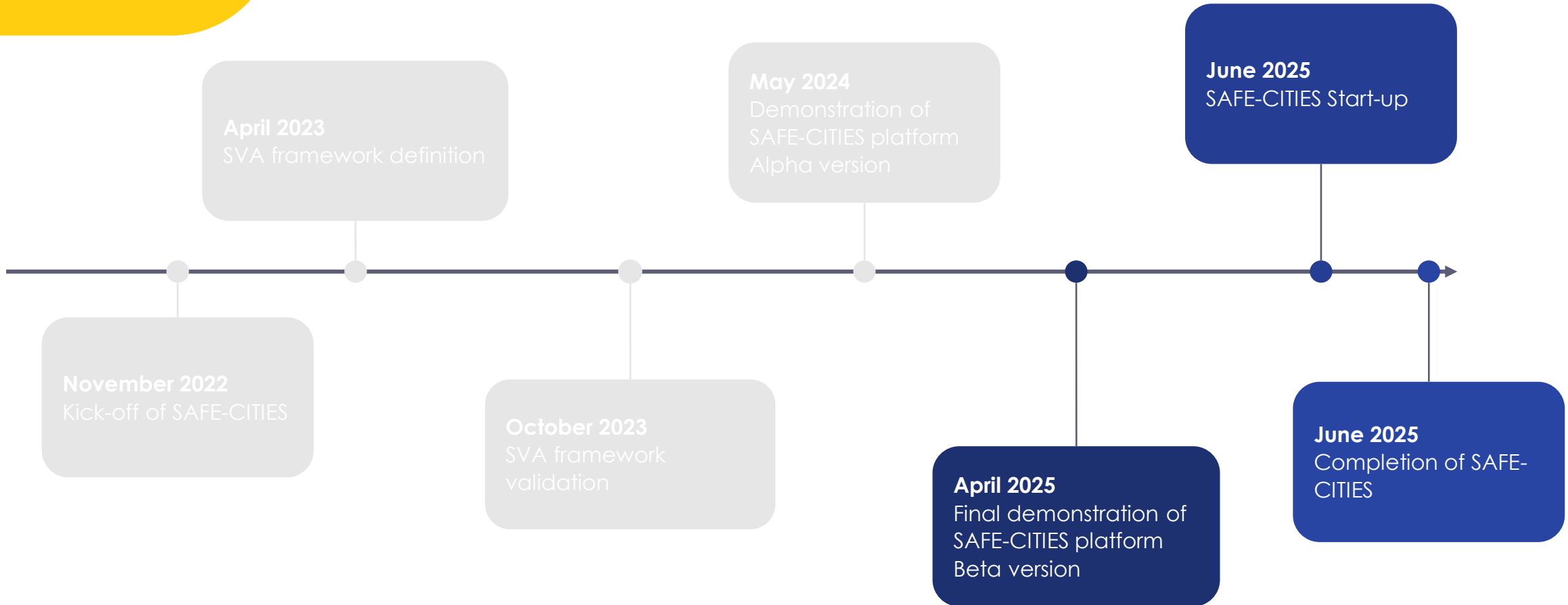
SAFE-CITIES Community

The SAFE-CITIES project approach bases on fostering bi-directional **communication and cooperation with all practitioners** and **clustering with relevant projects**.

Do you want to be part of this initiative?

Visit the SAFE-CITIES Website and fill the form!
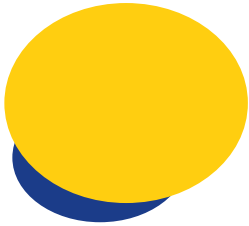www.safe-cities.eu

Thank you for your attention!

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