

## PRoTECT online seminar

#### Session 2

• Existing practices used at the local level for the protection of public spaces

**Keynote Presentation Giuseppe Cascavilla, Ph.D.** 

# "Best practices and solutions for protection of public spaces"

16 July 2020













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- 3. Technology Roadmap
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## Introduction and Main Objectives

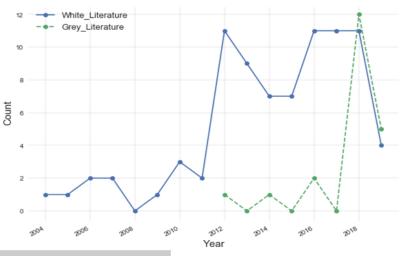
- Description of best practices and technologies for the protection of urban areas.
- Bringing innovative solutions (EU-based) originated from EU research projects in the security domain.
- Provide a technology roadmap for the protection of soft targets in EU cities.





## The Academia Approach



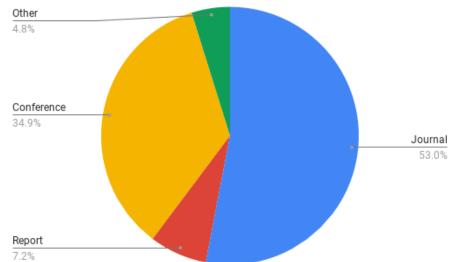


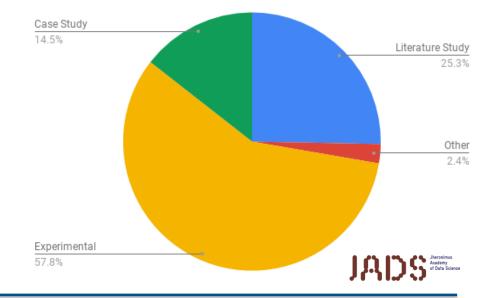
Venue	Count
Journal	44
Conference	29
Book	3
Magazine	1
Report	6

Study	Count
Literature Study	21
Other	2
Experimental Study	48
Case Study	12

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Journal	44
Report	6
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Other	4

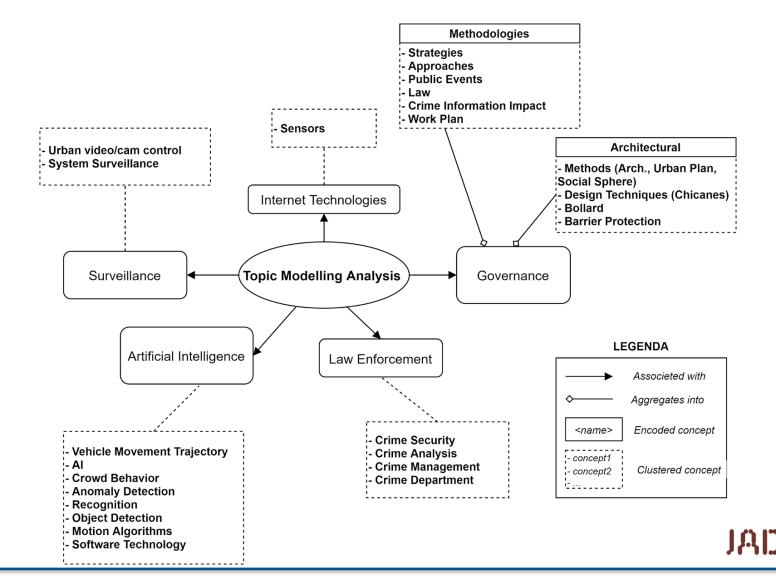
## Tot. analysed studies:





## The Academia Approach - Taxonomy





# The Academia Approach - Taxonomy In the Clustered

The **Encoded Concepts** Concept, we have Methodologies represents the 5 majors **Strategies** the main branches Approaches categories found by our **Public Events** the research is Law analysis. **Crime Information Impact** focusing on. - Work Plan - Sensors **Architectural** Urban video/cam control System Surveillance Methods (Arch., Urban Plan, Social Sphere) Design Techniques (Chicanes) Internet Technologies Bollard Barrier Protection **Topic Modelling Analysis** Surveillance Governance **LEGENDA** Artificial Intelligence Law Enforcement Associeted with Aggregates into Encoded concept <name> **Crime Security** Vehicle Movement Trajectory **Crime Analysis** !- concept1 ΑI **Crime Management** Clustered concept - concept2 **Crowd Behavior Crime Department Anomaly Detection** Recognition **Object Detection Motion Algorithms Software Technology** 





## Technology Roadmap - What is it?

- A strategic plan that defines a goal or set of goals.
- It consists of major steps or milestones to achieve specific outcomes.
- Is a document or visualization that can be used to accomplish a pre-set goal.
- It looks at the future, meaning it looks at the short-, mid- and long-terms.
- It provides a mechanism to help forecast technology developments.
- It provides steps to plan and coordinate technology developments.







# Application of a Tech. Roadmap in **PRoTECT**



- It is focused on how to identify relevant solutions, currently and looking at developments in the near future.
- We created 4 generic vulnerability categories to search and identify relevant technological solutions.
- Identify best practices and preferred solutions. It helps in scoping and focusing on what is important for the specific vulnerabilities and end users.
- Identify solutions from academia. We used the results of this SLR to identify the relevant technological solutions for the four vulnerability categories.
- Identify solutions from the market. We used a the Request for Information to get relevant technological solutions.
- Identify and analyze developments in the current and midterm.
- We have analysed all results and visualized what kind of technologies are relevant from the preferred solutions, academia and the market.







# Municipality: analysis & approaches

In the following slides all the cities related to the listed vulnerabilities have been anonymized to avoid leak of critical information.









## Municipality: vulnerabilities analysis



#### Lack of Physical Barriers

Lack of physical security measures

Square too close to main street

Not delimited square perimeters

#### Lack of Best Practices

Insufficient communication systems

#### Lack of Technical Solutions

Insufficient alert systems

Access control checks

Lack of surveillance systems

#### **Architectural Vulnerabilities**

Crowded places

No 'places to hide'

Narrow streets

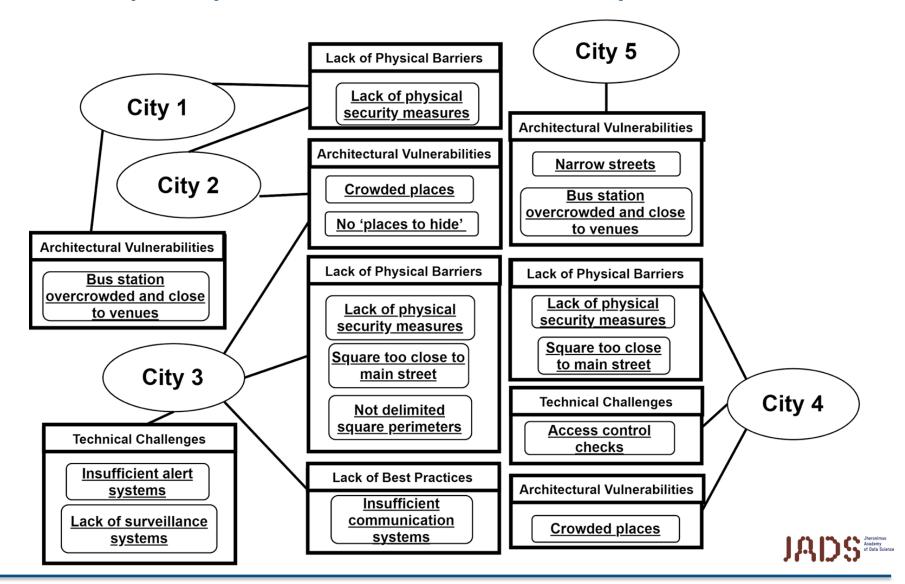
Bus station overcrowded and close to venues





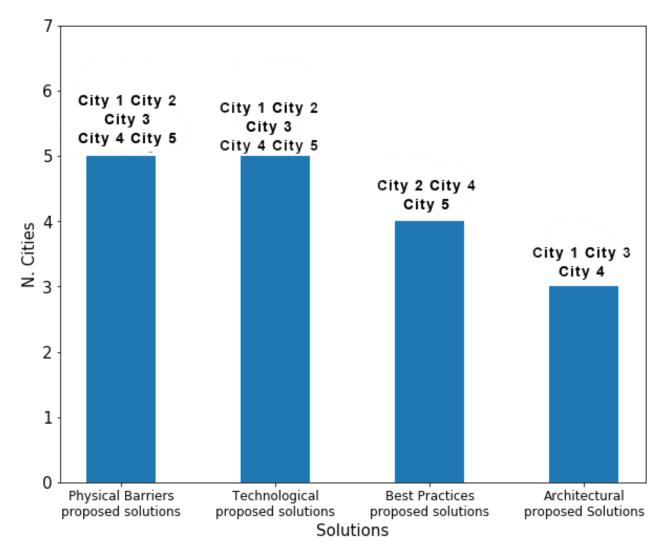
# PROTECT

# Municipality: vulnerabilities analysis





## Municipality: approaches analysis

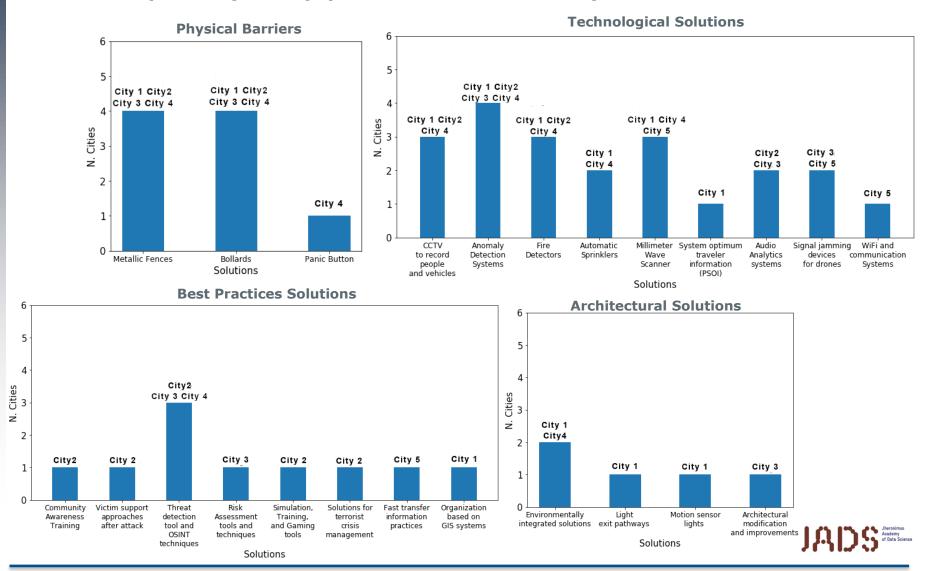








## Municipality: approaches analysis





## Roadmap - Tech solutions

#### Market

#### Artificial Intelligence

Artificial Intelligence Image recognition systems Deviating behaviors recognition Risky situations recognition Data fusion middleware for image recognition

#### SCIMON

- · Automated behavior tracking
- · Geo-tracking of objects and people identified
- Forensic tracking of objects or humans across historic video footage
- · Traffic management and analysis
- · Tracks of objects and people in the dark
- · Anti-social behavior

BioSurveillance face recognition

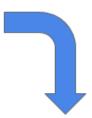
SENSR detects, classifies, tracks, and predicts objects from the connected Lidar sensors ViSense CrowdDynamics ViSense TrafficDynamics ViSense UrbanDynamics ViSense UrbanDynamics Sorama CAM audio analyser systems

#### Survaillance

UAVs (Unmanned aerial vehicle) and Drones Active and passive sensors Camera, Liddar, Radar, Ultrasonic, Thermal and driver sensors ASPECT 360 camera system for 360 degrees images Digital Eagle SK-62F UAV Sorama Listener listening the public domain

#### Internet Technologies

Cloud4Smart sensor platform IoT security and safety Lidar sensors



#### **Academic**

Artificial Intelligence	Survaillance
Vehicle Movement Trajectory AI Crowd Behavior Anomaly Detection	Urban video/cam control System Surveillance
Recognition Object Detection	Internet Technologies
Motion Algorithms Software Technology	Sensors



#### Municipalities

#### **Technological Proposed Solution**

Anomaly Detection Systems
Fire Detectors
Automatic Sprinklers
Millimeter Wave Scanner
GIS system for geographycal information of PSOI
Audio Analytics systems
Signal jamming devices for drones
WiFi and communication Systems

CCTV to record people and vehicles







# Roadmap - LEAs tools and Best Practices



#### Market Academic Law Enforcement Technologies **Best Practices Solution** Governance OSINT Public Events Management Law Voyager Crime Information Impact Work Plan IRIS SafeCity DarkCloud Law Enforcement Online Due Diligence · Skip Tracing Crime Security SOcial NEtwork MAnager (SONEMA) OSINT Crime Analysis Platform Crime Management Atlantis - 3D GIS system Crime Department Autotrack GPS location information ENGAGE IMS/CAD Call-Center solution for public & private safety organizations 8BTSS Thermal Screening System Portable radiation detectors Handheld radiation detectors Liquid explosive detector ACE-ID non-contact chemical identifier B-SCAN X-ray people screening CTX 5800 explosives detection system Municipalities EGO automatic detection people screening GasID gas and vapor chemical identifier HCVM X-ray screening system for vehicles **Best Practices Proposed Solution** HCVP Drive through a portal IONSCAN 600 Portable explosives and narcotics Community awareness training detector Victim support approaches after attack HSR gate to detect threats automatically Threat detection tool and OSINT techniques DroneKiller Ultra-light handheld anti-terror robot Risk Assessment tools and techniques XVR Platform Simulation, training, and gaming tools TERRA 4D (GIS system) Solutions for terrorist crisis management Fast transfer information practices Organization based on GIS systems





# Roadmap - Architectural and Barriers





#### **Academic**

#### Architectural Solution

Strategies
Approaches
Methods (Arch., Urban Plan, Social Sphere)
Design Techniques (Chicanes)

#### **Physical Barriers Solutions**

Bollard Barrier Protection

#### Market

#### **Physical Barriers Solutions**

Hostile vehicle mitigation (hvm) barriers
Temporary hostile vehicle mitigation
solutions
Bollards & barriers
Street furniture & outdoor seating
Large stone, concrete, wood & marble
outdoor commercial planters
Street bins and litter bins
Post and rail

#### Architectural Solution

Road ramp systems Speed bumps & cushions Wayfinding



#### Municipalities

#### **Architectural Proposed Solution**

Environmentally integrated solutions Light exit pathways Motion sensor lights Architectural modification and improvements

#### **Physical Barriers proposed solutions**

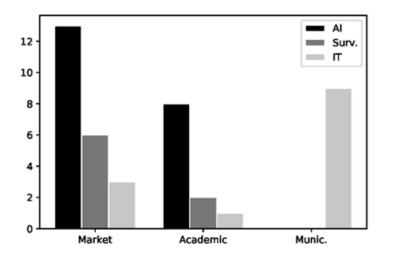
Metallic fences Bollards Panic Button

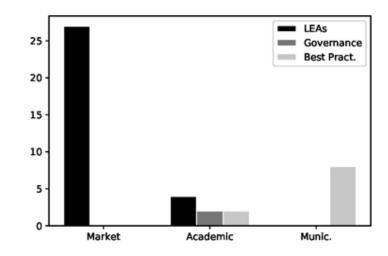


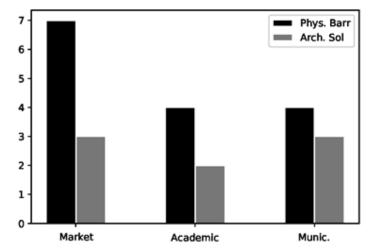




## Gap Analysis













**Finding 1**: There is no one single bullet-proof solution available among Market, Academic, and Municipality approaches and technologies.







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**Finding 2**: The Market, followed by the Academia, proposed the majority of tools and technologies that are suited for the protection of public spaces.

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CONS 2: need a training period

CONS 3: costly







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**Finding 3**: Physical Barriers and Architectural approaches resulted in the most used and available solutions for the protection of public spaces.

<u>CONS 1</u>: need an overall rethink of the urban areas to have low impact on liveability, walkability, character, and accessibility of public spaces

PROS 1: cheap

PROS 2: high level of security







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Finding 4: The gap found in Governance and Best Practices should further encourage the Market, Academia, and Municipalities to invest more time and resources in this research field. Develop specific approaches leveraging the knowledge of municipalities itself.

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# End of presentation

