



# **TIEMS – CBI Webinar on the IMPETUS Project**

- 1. Joe Gorman, SINTEF, Norway IMPETUS Project overview and expected Results
- 2. Jelena Radosevic, ISP, Croatia IMPETUS Public Opinion Survey on Ethical Issues on Smart Cities Technologies
- **3. Radu Popescu**, SIMAVI, Romania IMPETUS Platform Integration of Tools
- 4. Joe Levy, CINEDIT, Switzerland IMPETUS Weapon Detection Tool
- 5. Joaquin Luzon Tuells, INSIKT, Spain IMPETUS Social Media Threats Detection Tool
- 6. Osman Mohammad Ibrahim, City of Oslo, Norway IMPETUS Solutions Implementation in City of Oslo
- 7. Sandro Bologna, TIEMS, Belgium IMPETUS COSSEC Network



# **IMPETUS** A research and innovation project addressing urban safety





Intelligent Management of Processes, Ethics and Technology for Urban Safety A Horizon 2020 Research and Innovation Project

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 883286.

### IMPETUS: Intelligent Management of Processes, Ethics and Technology for Urban Safety

#### Key facts

- H2020 IA project
- Topic: SU-INFRA02-2019 Security for smart and safe cities, including for public spaces
- Total budget 9.3 M€, EC funding 7.9M€
- September 2020 February 2023
- Overall goal: Improve the security of public spaces in smart cities



### Contact info

www.impetus-project.eu

Project Coordinator: Joe Gorman, SINTEF Digital: joe.Gorman@sintef.no COSSEC Manager: Sandro Bologna, TIEMS: <u>s.bologna@infrastrutturecritiche.it</u> Dissemination manager: Snjezana Knezic, TIEMS: <u>snjezana.knezic@gmail.co</u>

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## WHEN will IMPETUS happen?

# Challenging: 30-months duration



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## WHY IMPETUS: Main objective

# **The IMPETUS intersection:** integrating interdependent solutions and concerns



# Improve the security of public spaces in smart cities

- Can advanced technologies improve the detection and management of security events?
- How will this affect **processes** used in day-to-day operations?
- How can **ethical** and legal issues be safeguarded and handled?

## WHY do Smart Cities need IMPETUS?

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### **Smart Cities**

- High-tech grid of sensors (cameras, environmental sensors, traffic sensors, ...)
- IoT ("Internet of Things") internet is everywhere not least in everyone's pockets
- IT systems controlling critical infrastructure
- Advanced algorithms and AI (Artificial Intelligence) to help people make decisions

Efficient city administration

Enhanced situational awareness, especially in emergencies

Help authorities make sound decisions, fast

←Enhan Combat→

IMPETUS

This project receives funding how the European Union's Horizon 2020 research and innovation purperamme under gra agreement No 883285 Increased "attack surface"- more vulnerabilities e.g. cyber attacks

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Increased risk of unethical use of personal data

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# **IMPETUS:** Key Results





#### **Integrating Platform**

- Tools usable in single interface
- Tools can connect and share data



### **Practitioner's Guidelines**

- Advice
- DOs and DON'Ts
- Reference information
- Training materials









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# **IMPETUS Tools**

Phase (w.r.t attack)	Before	Imminent	Dur	After	
Type of support	Be prepared	Detection	Situational awareness	Response optimization	Learning
Tools	Freach & attack simulation	Social media detection Weapon detection Weapon detection Biological risk detection This project receives funding	Cyber threat intelligence Cyber threat intelligence Physical threat intelligence		Cyberthreat response optimization

Horizon 2020 research and innovation programme under grant agreement No 883286.

### WHERE and how will IMPETUS be validated?

### Validation pilots in two cities





#### impetus-project.eu





**Thank you** very much for your attention, and for filling in and sharing the <u>IMPETUS web survey with your colleagues and friends.</u>





# IMPETUS Public Opinion Survey on Ethical Issues on Smart Cities Technologies

Jelena Radošević Institute for Security Policies, Croatia

IMPETUS Program on TIEMS – CBI Webinar Series 28<sup>th</sup> October at 1700 CET



What do citizens know / want/ need / worry about? re Smart City solutions





## How? CATI









# What did we actually want to determine?

- Do citizens know what *Smart Cities* (SC) are?
- What is their opinion on SC technology in general (safety and security in public spaces included)?
- Are they thinking about / worried about the possibility of unethical use of SC technology?







Summary	Padua	EU average	Comments
Familiarity with the concept of Smart Cities	cca 83%	cca 80%	No need for education :)
Necessity to use Smart Cities technology			
- public transportation	51%	76%	
- waste management	54%	76%	
- energy efficiency and management	47%	69%	
- smart management of healthcare	84%	74%	
- security	67%	58%	
- warning systems for high air pollution, danger of floods, landslides, earthquakes	43%	75%	
Trends in using Smart Cities technology	cca 65%	62%	*improved
Worries about the increasing level of digital skills needed for Smart Cities			
service	cca 8%	cca 20%	14







Summary	Padua	EU average	Comments
General perception of safety	cca 65%	cca 60%	
Recent change in the level of security	46%	18%	*improved
Violation of privacy rights and identity thefts			
- identity theft or attempted identity theft	2%	cca 10%	
- withdrawal of money from your account from an unknown source	2%	cca 10%	
- violation of privacy rights	9%	cca 20%	
- use of your personal data for unnecessary or unwanted purposes	73%	cca 50%	
Concern about misuse of personal information	least concerned		
Concern over the misuse of the data collected			
by the Smart Cities services	7%	42%	







Summary	Oslo	EU average	Comments
Familiarity with the concept of Smart Cities	cca 50%	cca 80%	*50% never heard about it
Necessity to use Smart Cities technology			
- public transportation	80%	76%	
- waste management	75%	76%	
- energy efficiency and management	62%	69%	
- smart management of healthcare	64%	74%	
- security	44%	58%	
- warning systems for high air pollution, danger of floods, landslides, earthquakes	83%	75%	
Trends in using Smart Cities technology	cca 70%	62%	*improved
Worries about the increasing level of digital skills needed for Smart Cities service	cca 15%	cca 20%	







0310	EU average	Comments
cca 80%	cca 60%	
71%	60%	no change
15%	cca 10%	
17%	cca 10%	
21%	cca 20%	
44%	cca 50%	
omewhat worried		
220/	400/	
0	cca 80% 71% 15% 15% 21% 21% 44% mewhat worried 32%	cca 80%       cca 60%         71%       60%         15%       cca 10%         17%       cca 10%         21%       cca 20%         44%       cca 50%         mewhat worried       42%



#### impetus-project.eu





**Thank you** very much for your attention, and for filling in and sharing the <u>IMPETUS web survey with your colleagues and friends.</u>



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For more information contact: jelena.radosevic@insigpol.hr Institute for Security Policies (Croatia) http://insigpol.hr/

# See you in December! CONFERENCE NEW EMERGENCY MANAGEMENT IN A RESILIENCE ERA FACING HEALTH, CLIMATE AND ENERGY CHALLENGES December 2021

# **IMPETUS** Platform

SIMAVI Radu.Popescu@siveco.ro



Intelligent Management of Processes, Ethics and Technology for Urban Safety







- Modular
- Interoperability
- Open & Extensible
- Future proofed
- IoT and Cloud computing approaches





#### Acces rights based on roles

- Within the platform users have associated roles, which allow access to certain features

#### Acces control policies

- Who can access information, where and when



#### Simultaneous users connected

- The platform allows the connection of simultaneous users.



- Single-Sign On
- LDAP and Active Directory
- Standard Protocols
- Centralized Management of users



### **Alert centralisation**

- The platform centralises the alerts produced by the integrated tools



### Alerts displayed

- The platform displays the alerts in dashboards



## **Alerts priority**

- The alerts have different level of attention

# BRD

#### brolstatus

#### Location: Oslo

Timestamp: 27/10/2021 10:33:26

Bacteria level in air: 19 Water level: 1425 Bleach level: 254 Dendridiag level: 497 Standard level: 619 Drain level: 440

#### 

CTI - Indicators of compromise

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Indicator of compromise #1632990175835

Created: 2021-03-12T09:58:36.867Z Feed Id: darkfeed\_010 Feed Name: malware\_download\_uris Post Id: e064c378d37e703f124db92a206eb48a1ad75495 Post Title: x495 Netflix Premium Accounts Source: forum\_crackingportal

#### Indicator of compromise #1632990170834

Created: 2021-03-12T09:58:36.867Z Feed Ia: darkfeed\_010 Feed Name: malware\_download\_urls Post Id: e064c378d37e703f124db92a206eb48a1ad75495 Post Title: x495 Netflix Premium Accounts Source: forum\_crackingportal

#### Indicator of compromise #1632990165833

Created: 2021-03-12T09:58:36.867Z Feed Id: darkfeed\_010 Feed Name: malware\_download\_uris Post Id: e064c378d37e7031124db92a206eb48a1ad75495 Post Title: x495 Netflix Premium Accounts Source: forum\_crackingportal



### IMPETUS dashboard





#### **Tools integrated**

- The platform is modular, individual tools can be added or removed without disturbing the functionality of the platform

#### Data integration

- Tool output is centralised at platform level

#### Data enrichment

- Outputs of the tools are combined in order to derive new information or to raise the alert confidence level

#### Standardised communication

- Data of the tools will respect platform defined format in order to ensure interoperability



- > IMPETUS platform should be intended to always be in operation.
- > IMPETUS platform must be protected from outside intruders.
- Best practices
  - Up to date software
  - User training and security awareness
  - Data protection in transit and in storage
- Vulnerability assessment
- GDPR compliance



#### Sharing of information

- Sharing of information to users from organisations which are not part of the IMPETUS operating environment.

#### Alerts for different operators

- IMPETUS platform provide alerts for different operators across different organisations.



#### Interaction with existing devices and platforms

- The IMPETUS platform interacts with existing devices and platforms in the cities.





#### Multiple languages

- The IMPETUS platform will be available in multiple languages.



#### Aggregated data and diagrams

The IMPETUS platform will provide aggregated data and diagrams to allow for strategic monitoring and planning.

#### Common terminology

- The IMPETUS platform will adapt a common terminology and symbology.



#### **Different forms of interaction**

- The platform supports different forms of interaction depending on the situation and user profile





#### Snap4City: Smart aNalytic APp builder for sentient Cities and IOT www.snap4city.org

The general architecture



Dashboard

- Every tool integrated will have an entry page in dashboard





#### Dashboard

- Widgets can be add into Dashboard

			$c \gamma \lambda 1 \cap$	າດວາ			
	Add new widget to das	shboard					
€ Selector  □	Metric and widge	Generic w	idget prope	properties			
Weather_sensor	Widget category	Data viewer 🖌	Title		Background color	rgba(2	
	Metrics category	Personal metrics 🗸	Content font size		Content font color	rgba(C	
Loading data, please wait	Metric	×	Header color	rgba(2	Header text color	rgba(C	
	Metric description		Period	No 🗸	Refresh rate (s)		
	Widget type		Height	~	Width		~
Selector - Map	Widget type	¥	U/M		U/M position	Next to v	*
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II - John							
Pontassieve	Specific widget pr	roperties					
						Cancel	Confirm




Are there any questions?





#### **IMPETUS Weapon Detection Tool**

Joachim Levy, CINEDIT, j@cinedit.com



MADE IN SWITZERLAND







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#### The **WEAPON DETECTION Tool's** Mission Is To Detect Weapons To Prevent **Loss Of Life**.









#### The Weapon Detection Tool Provides Instant **SITUATIONAL AWARENESS**.







But Even When Using The Latest Machine Learning And Al Algorithms, Detecting a Weapon With Security Cameras Is **Hard**, Because The Camera Angle And The Environment Is **Never The Same**.











Ultimately Undetected Weapons Lead To **Expensive** Site Closure And **Loss Of Life** Because The AI They Use Cannot Be Automatically Calibrated When The Camera Angle Changes.









#### As A Result Existing Weapon Detection Systems Constantly Produce False Alerts And Never Learn From It.











We Learn That To Detect Weapons The Al Needs To Be **Super Accurate**.

Therefore Data Sharing Is Key To Build Better Al's.







#### PROBLEM #1

#### Data Sharing Between **Smart Cities** and **High-Tech Companies** is **Very Limited** Due to GDPR Compliance.







#### PROBLEM #2

Due To **Drifting**, The AI Keeps Becoming **Unstable** And The Predictions Keep On Becoming **Erroneous**.







#### PROBLEM #2

See This Simple Linear Regression.

$$y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + ...$$

We Simply Map The **Independent Variables** x\_i To Predict The **Target Variable** y :





The IMPETUS Consortium		m	
RESEARCH	INDUSTRY & SMEs	NGOs	CITIES
SINCES SUTURE STATUS Development Developme		The international Internet Society	City of Padava









## It's Called AI Drifting

# It Pretty Much Means That Any Al Needs To Be Retrained To Remain Accurate.







#### It's An Update

#### Just Like When You Update An App On Your Phone







#### **This Update Prevents Drifting**

#### It keeps the Weapon Detection Tool Accurate

To do this, we need the Smart Cities to provide **Sample Data** as input to the re-training process









We must respect **GDPR Regulations** related to sharing of the type of sample data needed for training the AI. This can be challenging and time-consuming.

However: careful application of appropriate procedures and technical safeguards lets us share data in a GDPR-compliant way, allowing us to prevent AI drifting and help make you **Safer.** 







# With GDPR-compliant sharing of **Sample Data**, our AI can help you remain safe and **Prevent Terror Attacks**.









# Without our trained AI, the type of event that happened at The Bataclan is more likely. It could happen to you!





90 Dead







**SO**...

#### What Are You Going To Do About It?





#### Thank you!

Joachim Levy, CINEDIT, j@cinedit.com

# INTELLIGENT VIDEO ANALYTICS

MADE IN SWITZERLAND







#### **IMPETUS Social Media Detection Tool**

Joaquín Luzón Tuells, INSIKT Intelligence, joaquin@insiktintelligence.com





## Context: INSIKT Intelligence (I)



Social media produces too much and noisy content for the law enforcement, government and organizations alike: massive amounts of data flowing freely in a real time across multiple platforms.
Millions of messages per hour

Digital data -> Traces of criminal activity

- □ Radical content
- □Terrorist messages
- □ Hate speech
- □ Fake news
- Bullying
- Harassment



## Context: INSIKT Intelligence (II)



INSIKT's mission is to harness our technology for the good of society by putting tools with the potential to prevent crime and save lives in the hands of organizations who struggle to find meaning in the data deluge produced by social media



## IMPETUS Social Media Detection tool - Technologies



#### **Natural Language Processing**

- NLP, a sophisticated Artificial Intelligence method, doesn't simply spot keywords but rather understands human written language
- □ Enables the processing of massive amounts of textual data without human intervention
- □ Facilitates the extraction of topics, concepts, entities, key ideas from any human-generated digital text data

#### **Machine Learning**

Machine Learning algorithms create a general model based on social media data in order to interpret other data never seen before, i.e. prediction of future events, detecting sentiment or topics in social media updates without human supervision

#### **Network Analysis**

Proprietary Artificial Intelligence algorithms helping the users to understand relationships between people, organizations and events in order to piece together even the most complex puzzles

#### Anonymization

□ Encryption of social media data to preserve privacy of individuals and comply with European and national legislations



## IMPETUS Social Media Detection tool



The Social Media Detection tool, which commercial name is INSIKT Spotlight, is a unique platform, which collects and analyses massive amounts of online public data to help investigative professionals detect specific written content, powered by Artificial Intelligence methods, Data Mining, Text Mining with Natural Language Processing, Deep Learning, Big Data Analysis and Social Network Analysis in order to leverage cutting edge algorithms to surface hidden insights and cut through the noise to. effectively neutralise and prevent terror, crime and threats affecting cities.

Insikt Spotlight: https://www.insiktintelligence.com/our-solutions/spotlight-osint/



## IMPETUS Social Media Detection tool – Functionalities (I)



#### **Online data acquisition**

- Data is automatically acquired, given a frequency specified for each project. The sources of data for the IMPETUS Social Media Detection tool are:
  - Twitter
  - YouTube
  - TikTok
  - □ Other relevant websites specific to a country or region
- By creating a project, the analyst selects which are the sources that want to include in the investigation. The tool integrates scrapers adapted to each source. All the acquired data is shown in the dashboard as raw anonymised data and also within the different analysis.



## IMPETUS Social Media Detection tool – Functionalities (II)



#### Linguistic feature identification

- Seven different methodologies of Natural Language Processing are applied in 5 languages: English, Italian, Norwegian, French and Arabic.
- □ The analysis of the text is made from different perspectives:
  - □ Concepts extraction
  - □ Key Ideas extraction
  - Topic classification
  - □ Hate Speech detection
  - Entities extraction
  - □ Hashtag detection
  - Sentiment analysis



## **IMPETUS Social** Media Detection tool –



# **Functionalities (III)**

#### **Social Network Analysis**

- Analysis of observed interactions creating relationships relations between authors within Social Media.
- This analysis gives information about the users in terms of their activity within the Social Media, and their score as influencers, spreaders, and the role they have.
- Communities within Social Media are also detected and analysed.

#### Hate Speech

□ The text extracted from the social media and the local newspapers are analysed to evaluate the degree of hate speech they have.



## IMPETUS Social Media Detection









## Thank you!

Joaquín Luzón Tuells, INSIKT Intelligence, joaquin@insiktintelligence.com







#### IMPETUS Solutions Implementation in City of Oslo

Osman Ibrahim Agency for Emergency planning City of Oslo, Norway



IMPETUS Program on TIEMS – CBI Webinar Series 28<sup>th</sup> October at 1700 CET





- Oslo is the capital of Norway and the country's largest city with over 650,000 inhabitants.
- Compact capital city surrounded by the Oslo Fjord on its south side and the forest areas east, north and west
- Very accessible city and Norway's hub for national and international travel
- Hostcity for large events/international events

The City of Oslo holds both municipal and county functions

- Oslo Central Station bombing in 1982
- The Norway attacks 22th july 2011











Organizational chart City of Oslo





- Covid pandemic addressed new needs for insights in public opinions and understanding effects of implemented measures
- We have broken an important barrier under Covid
  - Actively using information about and from citizens in our intelligence and risk communication
  - New sources such as mobility data, healt data etc.
- We as individuals are the risk of spreading the virus
  - Closer on focusing on risk exposure at individual level
  - Covid risk vs threats ?







- Increase level of early detection and ability to provide indicators for predictive analysis and response
  - security and safety incidents
- Simplifies manual processes with greater data acquisition
- Optimization of knowledgebased response



- Promotes increased and cross-sectorial common situational awareness
- Implementation of IMPETUS in a wider environment that works, holistically, systematically, and crosssectorially with all risks we are exposed to




# Smart City Center – Risk operations Centers (ROC)

**OSLO** 

### The SOC process:

- 1. Expanding insight/information collection
- 2. Expanding analysis capacity and areas
- 3. Response activation
- 4. Evaluation and correction of response
- We expect to expand the applications of IMPETUS technologies



UN sustainable development goals Target 11b: *Implement Policies for Inclusion, Resource Efficiency and Disaster Risk Reduction. Resilience.* 





### **IMPETUS – COSSEC Network**

Sandro Bologna – TIEMS Belgium

**CBI Webinar** 

28<sup>th</sup> October 2021, 17:00 CET





COSSEC stands for "**Community of Safe and Secure Cities**". It is a group of individuals representing organisations or projects that have an interest in or might be affected by the work being done by the IMPETUS project. The first steps in establishing the community were made even before the project started, and one of the tasks in the project is to develop and foster COSSEC. We foresee that COSSEC will continue after the end of the IMPETUS project itself, as a forum for organizations interested in using IMPETUS results, or with a wider interest in the topics addressed by the project.

The idea of COSSEC is to extend involvement in the project to stakeholders beyond the project consortium. COSSEC members will **influence IMPETUS activities** so that solutions emerging from the project will meet local needs in other cities and/or meet other concerns or requirements they might have. Some COSSEC members will be early adopters of project results.





## COSSEC Status at 22.10.2021



#### **COSSEC** expectation from IMPETUS DoA (Description of Activities)

Number of members: > 40 members

Diversity of members: > 10 cities

Diversity of members: > 5 citizen groups

Diversity of members: > 10 EU countries

Number of Workshops: = 2

Number of Webinars: = 2

#### COSSEC Status October 22, 2021

Number of members: 24 (for details see COSSEC Platform <a href="https://pr4gdm.giftmaru.com/">https://pr4gdm.giftmaru.com/</a>) Diversity of members: 6 cities (for details see COSSEC Platform <a href="https://pr4gdm.giftmaru.com/">https://pr4gdm.giftmaru.com/</a>) Diversity of members: 1 citizen group (for details see COSSEC Platform <a href="https://pr4gdm.giftmaru.com/">https://pr4gdm.giftmaru.com/</a>) Diversity of members: 11 EU countries (for details see COSSEC Platform <a href="https://pr4gdm.giftmaru.com/">https://pr4gdm.giftmaru.com/</a>) Number of Workshops: 0 (limited by COVID-19) Number of Webinars: 2 (for details see COSSEC Platform <a href="https://pr4gdm.giftmaru.com/">https://pr4gdm.giftmaru.com/</a>)



#### 1<sup>st</sup> COSSEC Webinar 04.05.2021



#### USE OF ADVANCED IT FOR THE PROTECTION OF PUBLIC SPACES Virtual Meeting, May 04, 2021, 4 p.m. to 6 p.m. CET

4 p.m Presentations of Projects and Initiatives (chaired by COSSEC Sandro Bologna)

**IMPETUS - Intelligent Management of Processes, Ethics and Technology for Urban Safety (H2020)** Joe Gorman (SINTEF), Matthieu Branlat (SINTEF)

SURE - Smart Urban Security and Event Resilience (UIA Initiative) Autero Anniina (Tampere), Säpyskä Minna (Tampere)

Snap4City - Firenze Smart City Control Room (International) Paolo Nesi (University of Florence)

**Open & Agile Smart Cities (OASC International)** Davor Meersman, Ricardo Pinho, Gert De Tant (OASC International)

5 p.m. Plenary discussion around the most challenging topics (chaired by IMPETUS Matthieu Branlat)

Security technology application for the protection of public spaces with contributions from IMPETUS: Joaquin Luzon (Insiktintelligence) and Joe Levy (Cinedit)

**Operational impact of security technology application for the protection of public spaces** with contributions from IMPETUS: Lars Ole Grottenberg (OSLO Kommune)

6 p.m. End of the virtual meeting

To get copies of the presentations go to <u>https://pr4gdm.giftmaru.com/</u> Section: Activities/Events/Virtual Meeting May 4<sup>th</sup>, 2021



# IMPETUS2nd COSSEC Webinar at<br/>16.06.2021



#### Ethical and Legal Issues with the use of Smart Cities Technologies for Public Protection Virtual Meeting, June 16, 2021, 2 p.m. to 4 p.m. CET

2 p.m Introduction to the Virtual Meeting Sandro Bologna (COSSEC Chair)

Survey on use of Smart Technologies in Detecting Security Threats in Public Spaces - Ethical Issues (ISP IMPETUS Partner - Croatia)

Ethical Issues, personal data protection and possible misuses of personal data: a European perspective (COSSEC Member Luigi Carrozzi - Expert of personal data protection - Italy )

Ethical Issues of perceived fairness in Machine Learning (ML) (COSSEC Member Deepak Khazanchi - University of Nebraska at Omaha, USA)

Open Discussion about some controversial claims (Chaired by Krunoslav Katic – ISP IMPETUS Partner)

4 p.m. End of the virtual meeting

To get copies of the presentations go to <u>https://pr4gdm.giftmaru.com/</u> Section: Activities/Events/Virtual Meeting June 16<sup>th</sup>, 2021



Projects and initiatives to improve the security of public spaces and community resilience are invited to apply for joining COSSEC

If you want to learn more about COSSEC, please contact: Sandro Bologna, TIEMS, <u>s.bologna@infrastrutturecritiche.it</u>

#### or visit

the dedicated COSSEC Platform at <a href="https://pr4gdm.giftmaru.com/">https://pr4gdm.giftmaru.com/</a>