



NORTH ATLANTIC TREATY ORGANIZATION  
ORGANISATION DU TRAITÉ DE L'ATLANTIQUE NORD



# DEXTER

## Detection of EXplosives to counter TERrorism

ESC/SPS Francesca Tortorella

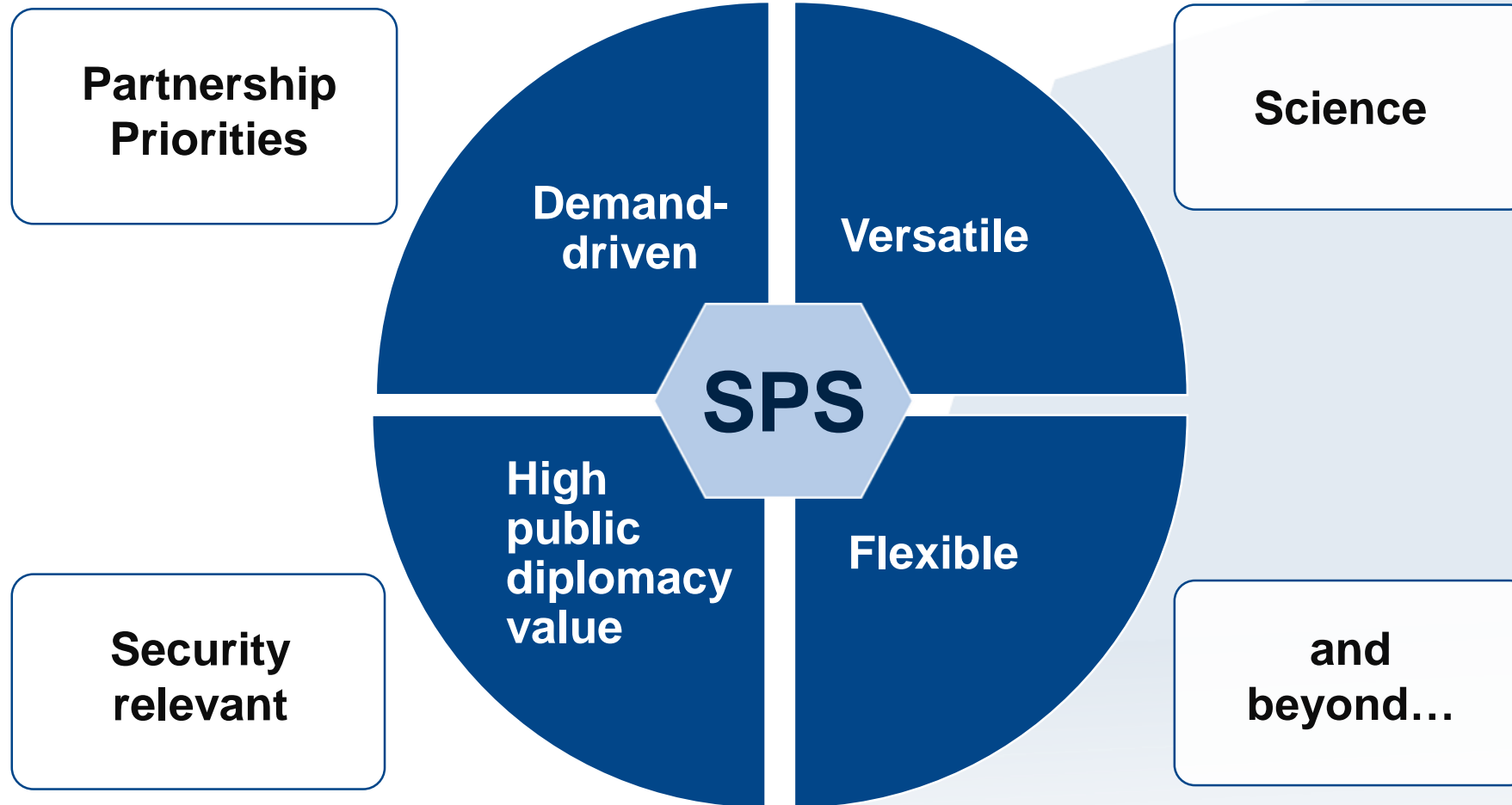
Science for Peace and Security (SPS) Programme



01. **The Science for Peace and Security (SPS) Programme**
02. **SPS Key Priorities and NATO's Future Outlook**
03. **Remote Detection of Explosives**
04. **The DEXTER Programme**

01. **The Science for Peace and Security (SPS)  
Programme**

# The SPS Programme is..



...in close cooperation with NATO Divisions and bodies



**Mediterranean Dialogue (MD)**

Algeria, Egypt, Israel, Jordan,  
Mauritania, Morocco, Tunisia

**Euro-Atlantic Partnership  
Council (EAPC)**

Armenia, Austria, Azerbaijan, Bosnia  
and Herzegovina, Finland, Georgia,  
Ireland, Kazakhstan, Kyrgyz  
Republic, Malta, Republic of  
Moldova, Montenegro, Serbia,  
Sweden, Switzerland, Tajikistan,  
Turkmenistan, Ukraine, Uzbekistan

**Partners across the  
Globe (PaG)**

Australia, Colombia, Iraq,  
Japan, Republic of Korea,  
Mongolia, New Zealand,  
Pakistan

**Istanbul Cooperation Initiative (ICI)**

Bahrain, Kuwait, Qatar, United Arab Emirates

# Public Diplomacy

- **SPS Website:** SPS activities are featured online in news stories, videos and dedicated brochures
- **Social Media:** Photos, announcements and updates on SPS activities are shared on the **SPS Twitter Account @NATO\_SPS**
- SPS activities have been featured in **mainstream media** such as the New York Times, Bloomberg Business, Politico, Washington Post
- Publication of ARW, ASI and ATC proceedings in the **NATO Science Series**
- **SPS Information Days** in NATO and partner nations

## How bees and drones team up to find landmines

By Chris Baraniuk  
Technology of Business reporter

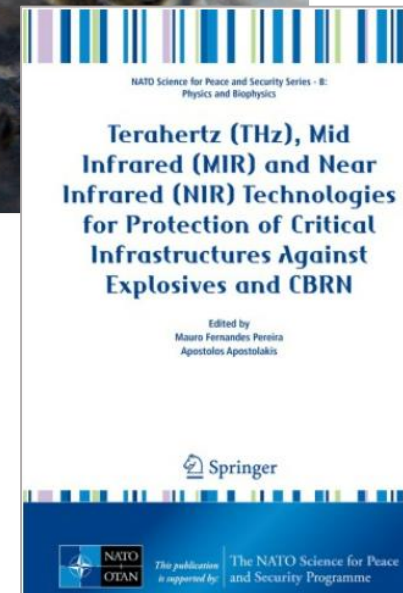
© 30 March



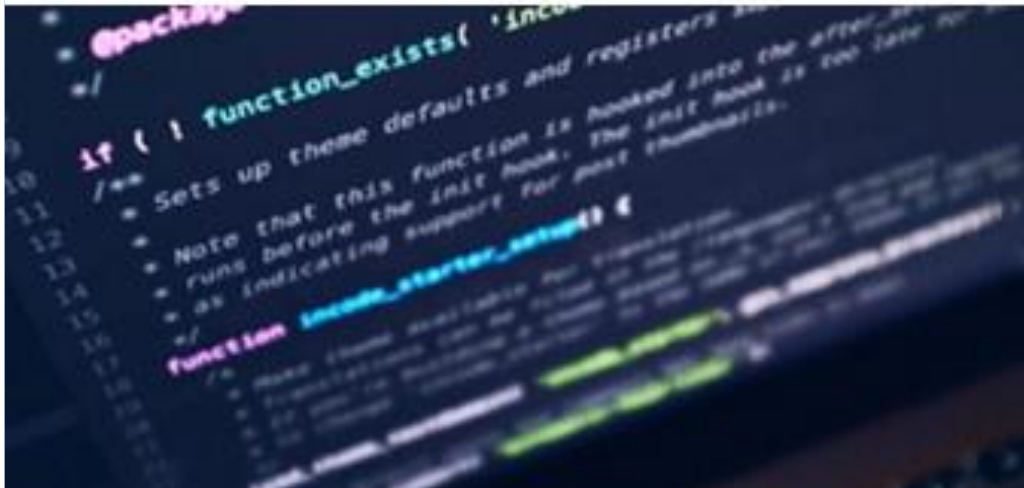
NATO SPS Programme @NATO\_SPS · Nov 16, 2021

Scientists from 🇺🇸, 🇪🇸, 🇩🇪 & 🇬🇧 are developing #quantum-safe solutions for fundamental cryptographic algorithms, which are currently the base for securing digital communications.

Read more about this project on the #NATOSPS website [bit.ly/30gMpNs](https://bit.ly/30gMpNs)



# 03. SPS Key Priorities and NATO's Future Outlook



## Emerging Security Challenges

- Counter-Terrorism
- Energy Security
- Cyber Defence
- Defence against CBRN Agents
- Environmental Security



## Support for NATO-led Operations & Missions





## New Developments & Crisis Prevention

- Security-related advanced technology
- Border and port security
- Mine and UXO detection and clearance
- Human and Social aspects of Security



## Other Directly Security-Related Topics

# NATO's Future Outlook



Preservation of our technological edge



Adoption of a new Strategic Concept

# A Growing Innovation Ecosystem

## **Science for Peace and Security (SPS) Programme**

- In the Emerging Security Challenges Division since 2010.
- Supports security-related civil science and technology to address emerging security challenges by bringing together scientists, experts and officials from NATO and its partner countries.
- Thematic alignment with Allied-agreed key priorities.

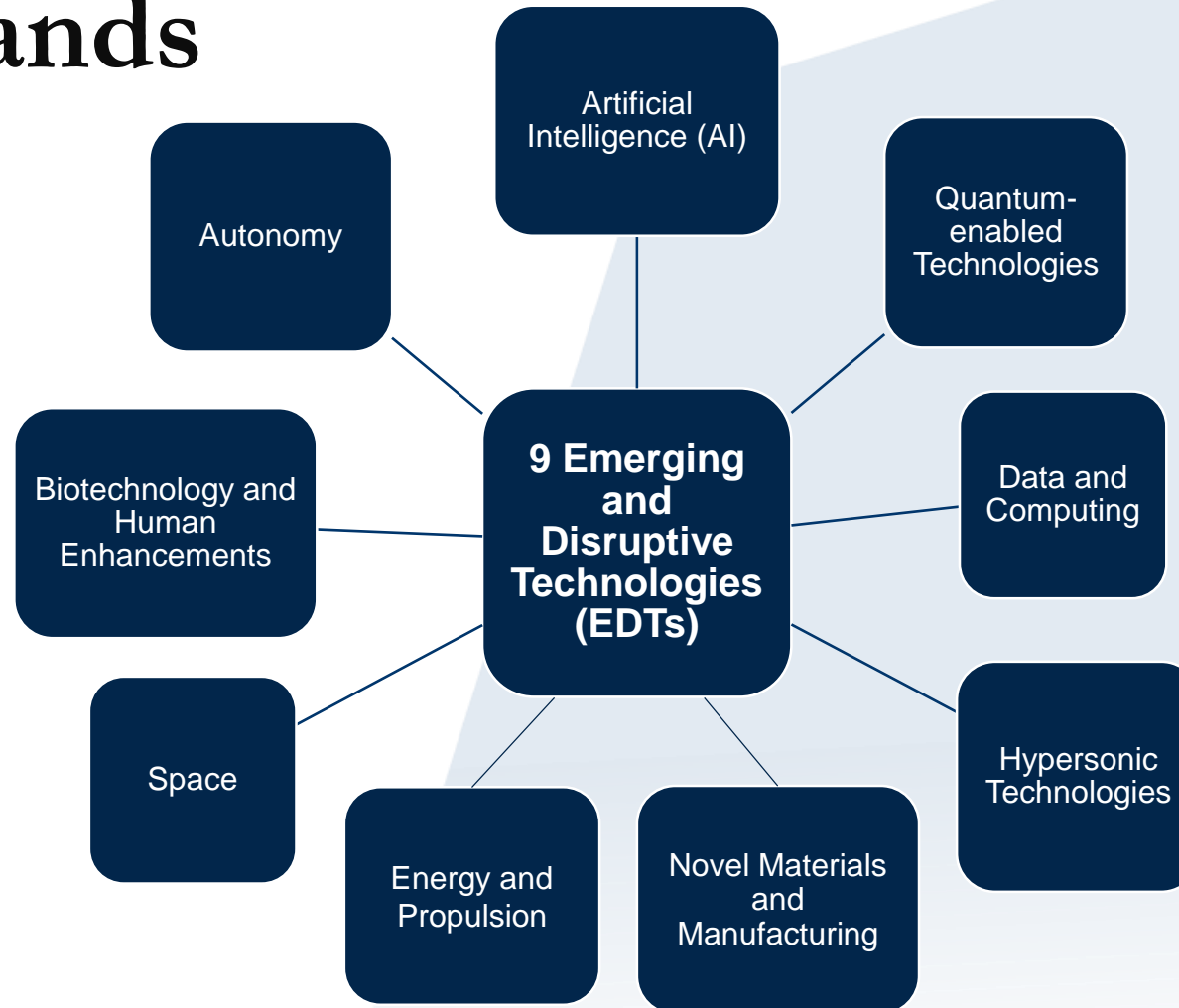
## **Defence Innovation Accelerator for the North Atlantic (DIANA)**

- Established at the June 2021 NATO Brussels Summit
- To boost transatlantic cooperation on critical technologies, promote interoperability and foster innovation by engaging with academia and the private sector, including start-ups.
- Will include offices and test centres across the Alliance.

## **NATO Innovation Fund**

- Established at the June 2021 NATO Brussels Summit
- 1 billion euros funding mechanism
- To enable strategic investment in start-ups developing dual-use technologies of potential application to defence and security.

# EDT Work Strands



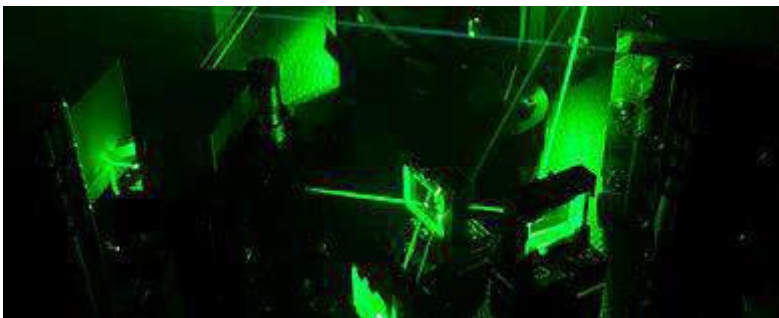
## 03. Remote Detection of Explosives

# SPS Experience with Explosives Detection



Over 35 SPS projects launched in the past 5 years.

Detection of conventional explosives as well as improvised devices.



## Advancement of technology

Greater sensitivity, enhanced sophistication, improved detection range, autonomy, portability, cost-efficiency, integration of sensors

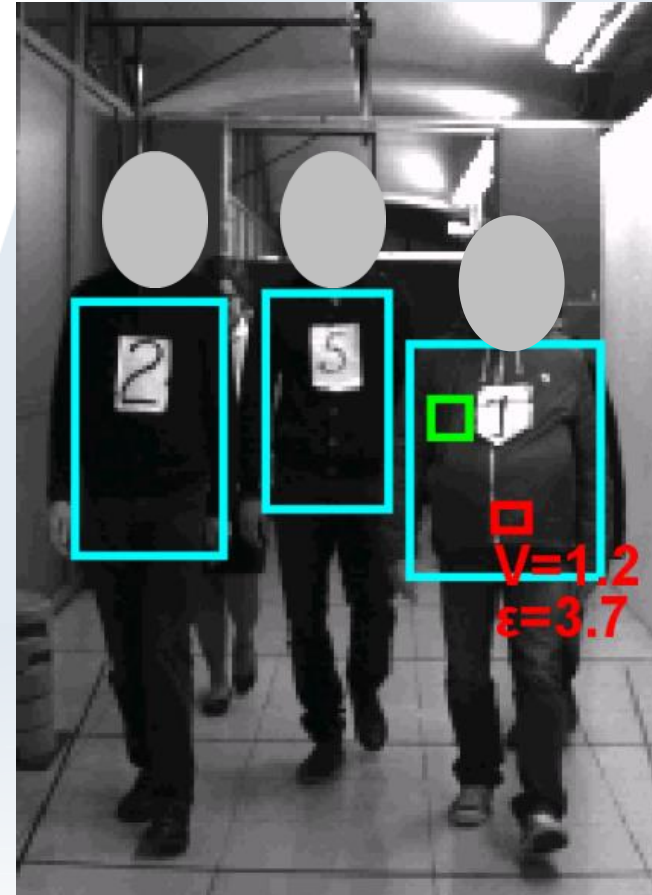
# Standoff Detection in Mass Transit Venues

Project on standoff detection of explosives

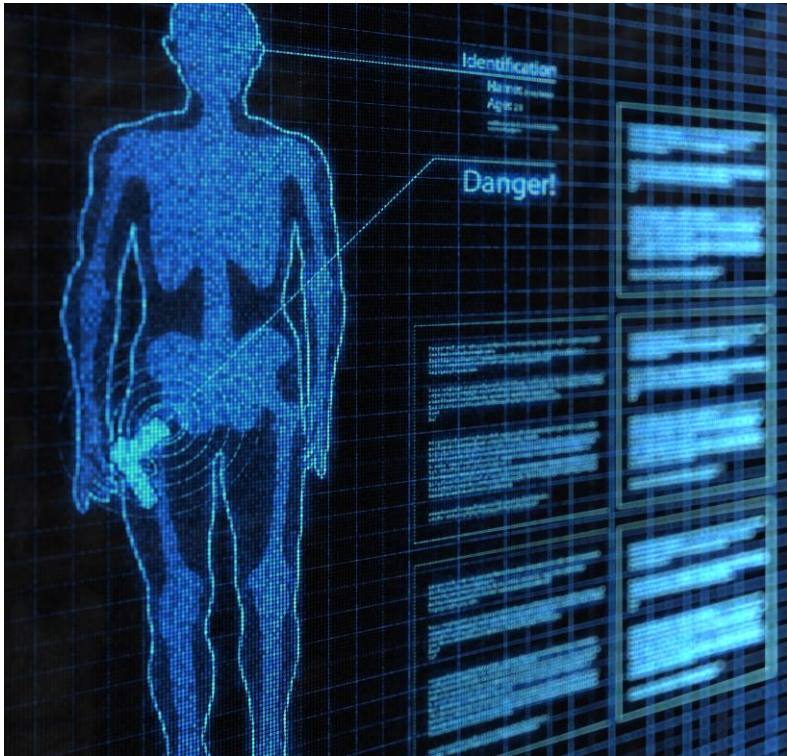
Implemented between 2009-2013

Included:

- Active microwave imaging
- UV Laser/RAMAN spectroscopy
- Data merging and video tracking integration
- 2 weeks of Big City Trial in Paris



# Towards a Better Detection System



- ✓ To include new partners
- ✓ To extend scope
  - Improving detection technology
  - Integrating new sensors to detect firearms (not only explosives)
  - Further advancing prototype development
- ✓ To bolster NATO efforts in counter-terrorism
- ✓ To strengthen the technological angle





## 04. The DEXTER Programme

# DEXTER



**DEXTER** (Detection of Explosives and firearms to counter TERrorism) is a NATO SPS flagship initiative aimed at developing an **integrated system that can detect explosives and firearms in public places**, remotely and in real time, without disrupting the flow of pedestrians.

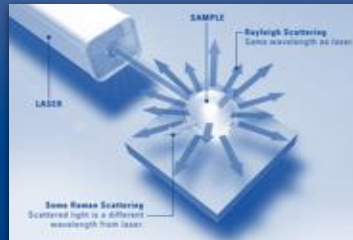
# DEXTER includes...

3

integrated  
projects



Microwave Imaging Curtain (MIC)



EXplosive TRAce detection Sensor (EXTRAS)



INtegrated System for Threats EARly Detection  
(INSTEAD)

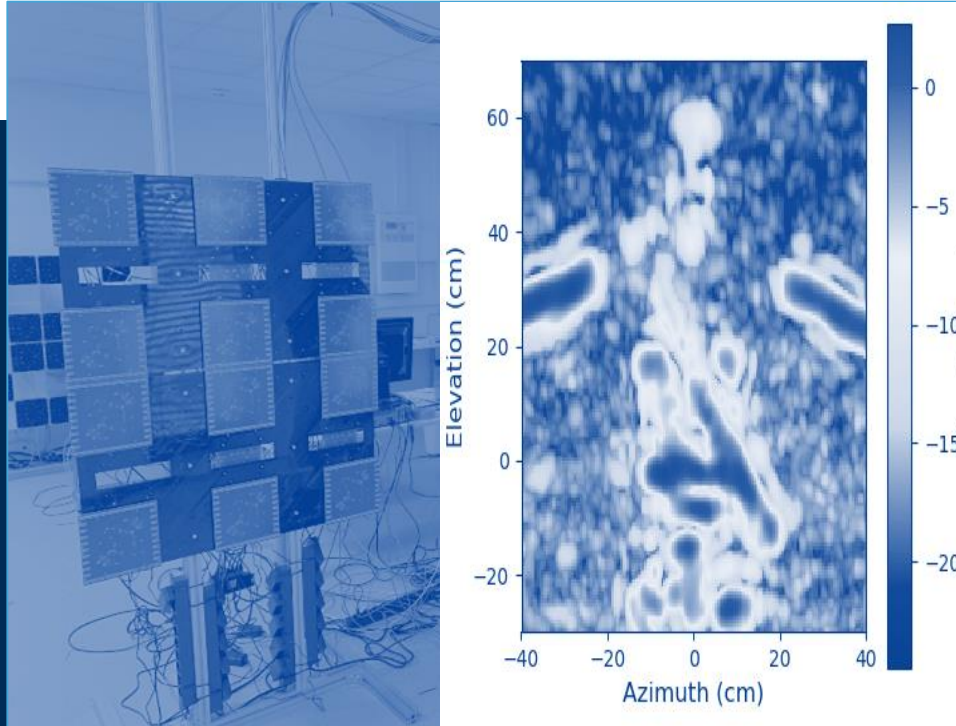


# DEXTER Governance

- The **DEXTER Consortium Agreement** was signed on 8 July 2019.
- To provide a coordination framework among the three projects, while ensuring close engagement among stakeholders.
- The **Executive Board** includes all participating countries, plus five NATO nations contributing financially.

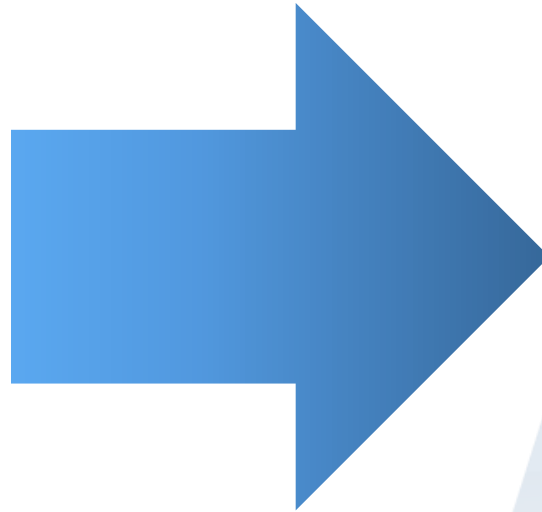


# The Big City Trial



- In a subway station in Rome, Italy.
- May 2022.
- Testing multiple scenarios.
- To demonstrate the integration of DEXTER technologies in a **real-life environment.**

# After the Big City Trial



- Data analysis and assessment
- Moving from prototype towards a commercially viable product
- Investment:
  - Connection with Industry
  - Link with NATO S&T ecosystem and new initiatives
- Goal: Market adoption



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