PRECINCT

Preparedness and Resilience Enforcement for Critical Infrastructure Cascading Cyber-Physical Threats

CPS4CIP 2021 – Cyber-Physical Security For Critical Infrastructures Protection

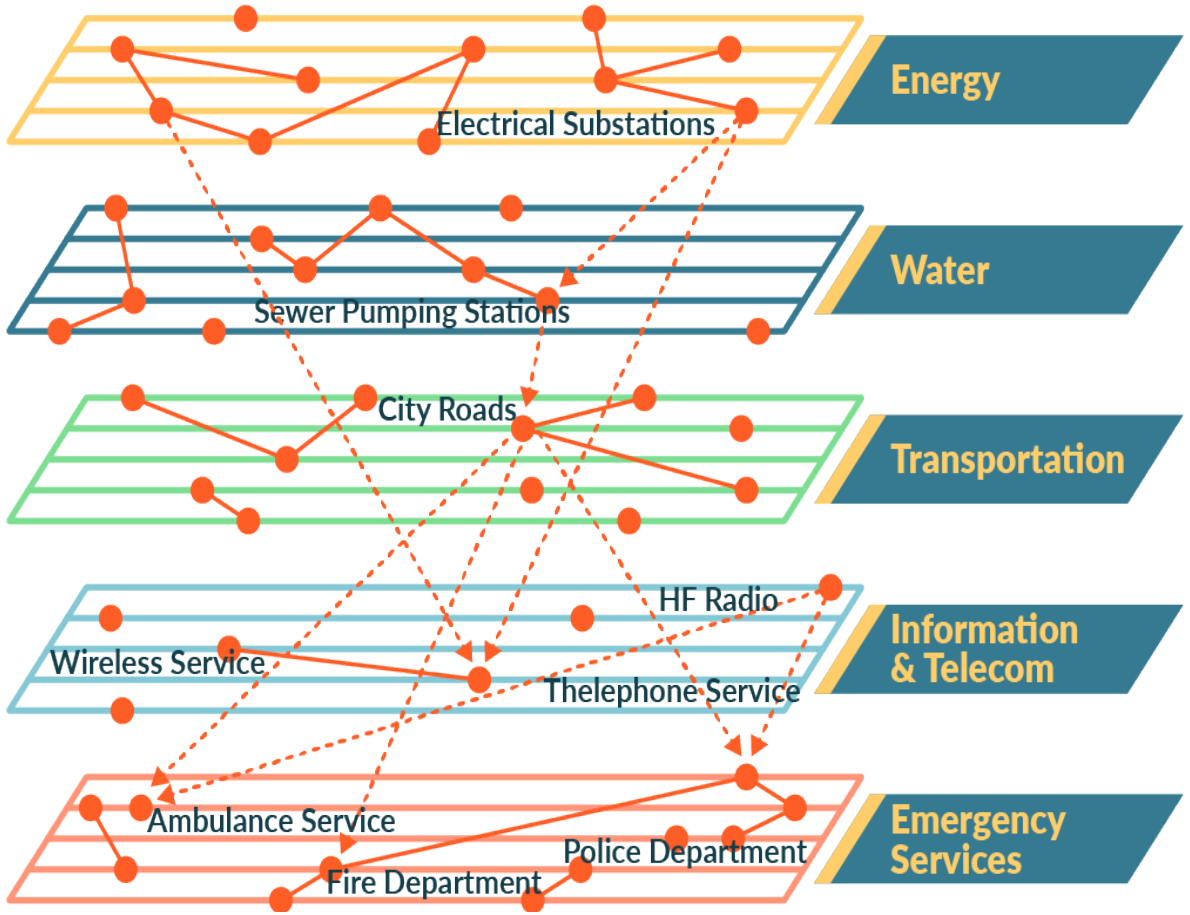
Presenter: Jenny Rainbird

Company: Inlecom

Date: 8th October 2021

The challenge

- Disruptions in CI may result from hazards, physical and/or cyber-attacks on installations and their interconnected systems.
- Increase of combined physical and cyber-attacks due to their interdependencies.
- A comprehensive approach is needed to secure existing and future, connected and interdependent CI installations, plants and systems that is accurate, efficient and cost-effective and where possible automated that minimizes cascading effects.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 101021668.

The approach

- The overall project's technical objective is to establish an Ecosystem Platform for connecting stakeholders of interdependent CIs and Emergency Services to collaboratively and efficiently manage security and resilience by sharing
  - Data
  - Critical Infrastructure Protection models
  - New resilience services
- PRECINCT will implement Digital Twins and Serious Game approach to identify vulnerabilities and testing/validate new detection and mitigation models and associated services in a real-time real-life context.

PRECINCT

Fact File

PRECINCT
Preparedness and Resilience Enforcement for Critical Infrastructure Cascading Cyber-Physical Threats

2 year project
Start date: 1st October 2021
End date: 30th September 2023
Total budget: €9,472,739.05
40 Partners - EU and South America

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The partners

PRECINCT

Prometni institut Ljubljana d.o.o.
Institute of Traffic and Transport Ljubljana l.l.c.

Barcelona Supercomputing Center
Centro Nacional de Supercomputación

TECHNOLOGY
GRUPPO FERROVIE DELLO STATO ITALIANE

EOS
EUROPEAN ORGANISATION FOR SECURITY

LPP
Zapelji se na www.lpp.si

ATHENS INTERNATIONAL AIRPORT
ELEFTHERIOS VENIZELOS

POLIS
CITIES AND REGIONS FOR TRANSPORT INNOVATION

ITL
ISTITUTO sui TRASPORTI e la LOGISTICA

Slovenske železnice

KEMEA

ICS
INSTITUTE FOR CORPORATIVE SECURITY STUDIES

ATTIKO METRO S.A.

ATTIKES DIADROMES S.A.

AKKA
PASSION FOR TECHNOLOGIES

NUROGAMES

ENGINEERING

CONCEPTIVITY

360° SECURITY

TelekomSlovenije

Elektro Ljubljana

R·S

Aeroporto di Bologna
Aeroporto Guglielmo Marconi di Bologna S.p.A.

imec

UITP
ADVANCING PUBLIC TRANSPORT

VLTN

UCD DUBLIN

tecnalia
Inspiring Business

lepida CUP2000

montimage

AIT
AUSTRIAN INSTITUTE OF TECHNOLOGY

water-link

inlecom

KU LEUVEN

dlr

Comhairle Contae County Council

LUXEMBOURG INSTITUTE OF SCIENCE AND TECHNOLOGY
LIST

CORTE
Confederation of Organisations in Road Transport Enforcement

VAS
institute

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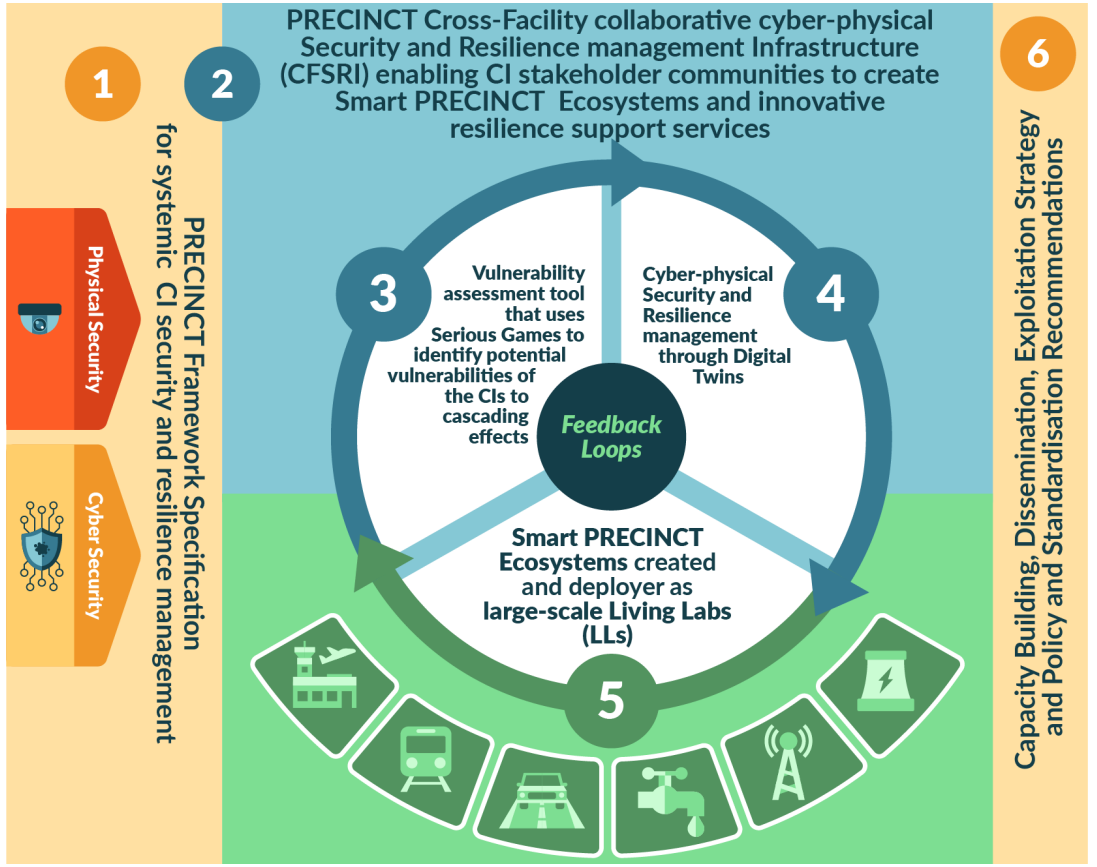
The key outputs

1. A PRECINCT Framework Specification for systematic CIs security and resilience management fulfilling industry requirements elicited with stakeholders within the LLs and integrating new insights from reference EU projects.
2. A Cross-Facility collaborative cyber-physical Security and Resilience management Platform enabling CI stakeholders to develop AI-enabled PRECINCT Ecosystems and enhanced resilience support services.
3. A vulnerability assessment tool that uses Serious Games to identify potential vulnerabilities of the CIs including cascading effects and to identify resilience enhancements for each CI and the coordinated measures.
4. Digital Twins to represent the CIs network topology and metadata corresponding to the relevant dependency profiles, applying closed-loop Machine Learning to detect anomalies and alert conditions and to provide optimised activation of response and mitigation measures and automated forensics.
5. Smart PRECINCT Ecosystems, deployed in four large-scale LLs and in transferability validation demonstrators, will provide measurement-based evidence of the targeted advantages.
6. Sustainability outputs including Capacity Building, Dissemination, Exploitation and Policy and Standardisation Recommendations.



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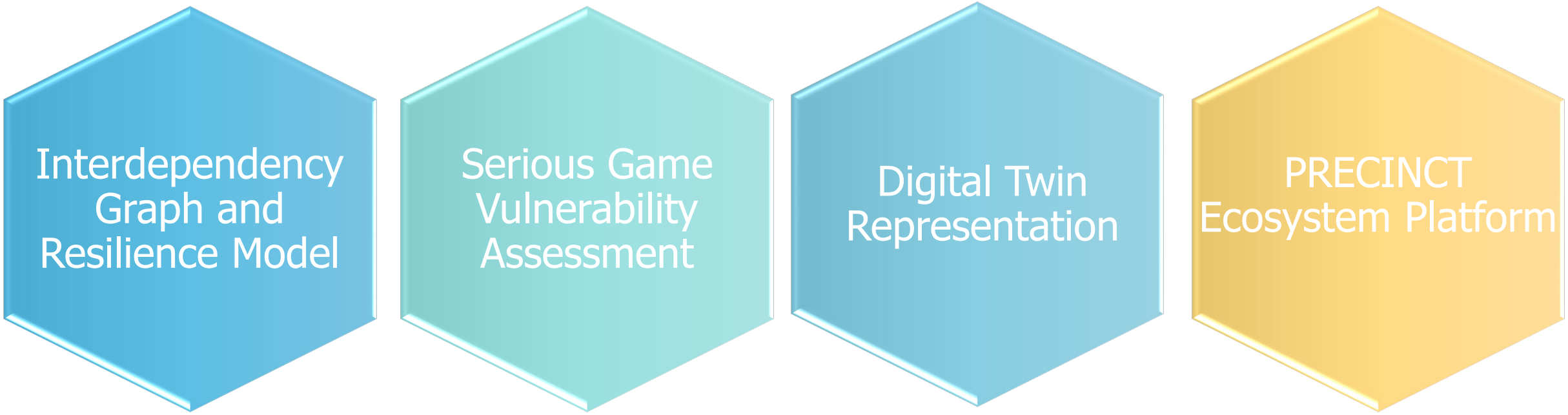
PRECINCT Innovation Focus Areas



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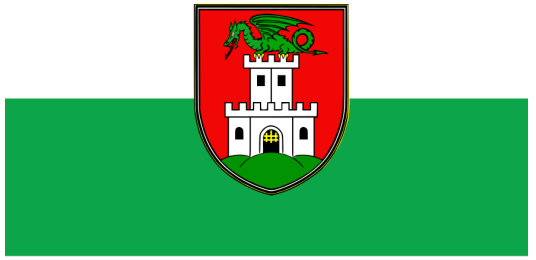
The Living Labs

Multi-CI coordination centre – Ljubljana



- Interconnected CIs
  - The Slovenian National Railway Company and Traffic Institute
  - The City of Ljubljana bus transport operator
  - The Telekom Slovenije
  - Elektro Ljubljana
  - The City of Ljubljana's Municipality Police
  - The Institute for Corporate Security Studies
  - Support from the Information Security Administration of the Republic of Slovenia

Case study

- physical threat (bomb) and a cyber-attack with simultaneous DDoS attacks to critical parts of the critical Industrial Control Systems (ICS) of the electricity and communication operators, which provide important services for business continuity of the transport mobility hub.

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Emergency Services & coordinated CIs through city Digital Twin - Antwerp

- Police Zone Antwerp
- Water-link
- IMEC - integrated CI models for flooding and traffic prediction
- KUL - city's flooding model and rainfall nowcasting
- VIAS will coordinate

Case study

- Interdependencies and cascading effects.
- Effects of major flooding in the metropolis Antwerp on traffic infrastructure, tunnels, streets, roads and metro
- Energy blackouts
- Direct or indirect impacts on hospitals, emergency services and chemical industry.

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Transport reliance- Athens

- Athens airport
- Attiko Metro
- Attikes Diadromes - will contribute to road/motorway-related data
- KEMEA - holistic PRECINCT security framework

Case study

- Airport Cyber-attack
- Attack on voice, data, radio, air to ground communications impacting Airport, Metro and Road stakeholders comms.
- Attach on fibre optic cable routings impacting train signalling and toll operation
- Physical earthquake and realistic scenarios combining multi-hazards from above will be specified by the serious game approach.

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ICT Critical Infrastructure - Bologna

- Lepida - IT for the Regional Government
- Bologna airport
- Ferrovie dello Stato - data sources and threat scenarios
- The Institute for Transport & Logistics
- Emilia-Romagna Region Regional Government
- Bologna Metropolitan City
- Local emergency responders, Police dept and traffic police.
- Local Health Authority of Bologna
- TPER (public transport operator)
- SRM Reti e Mobilità (Local Authority for Public Transport)
- Marconi Express - Bologna Int. Airport to city of Bologna transport link
- Port Authority of Ravenna

Case study

- Airport Cyber-attack / cyber physical attacks on rail/ airport infrastructures combined with attack on the Lepida IT system reducing the ability of the CIs and authorities to communicate with the public and cascading effects on mobilisation of first responder services.

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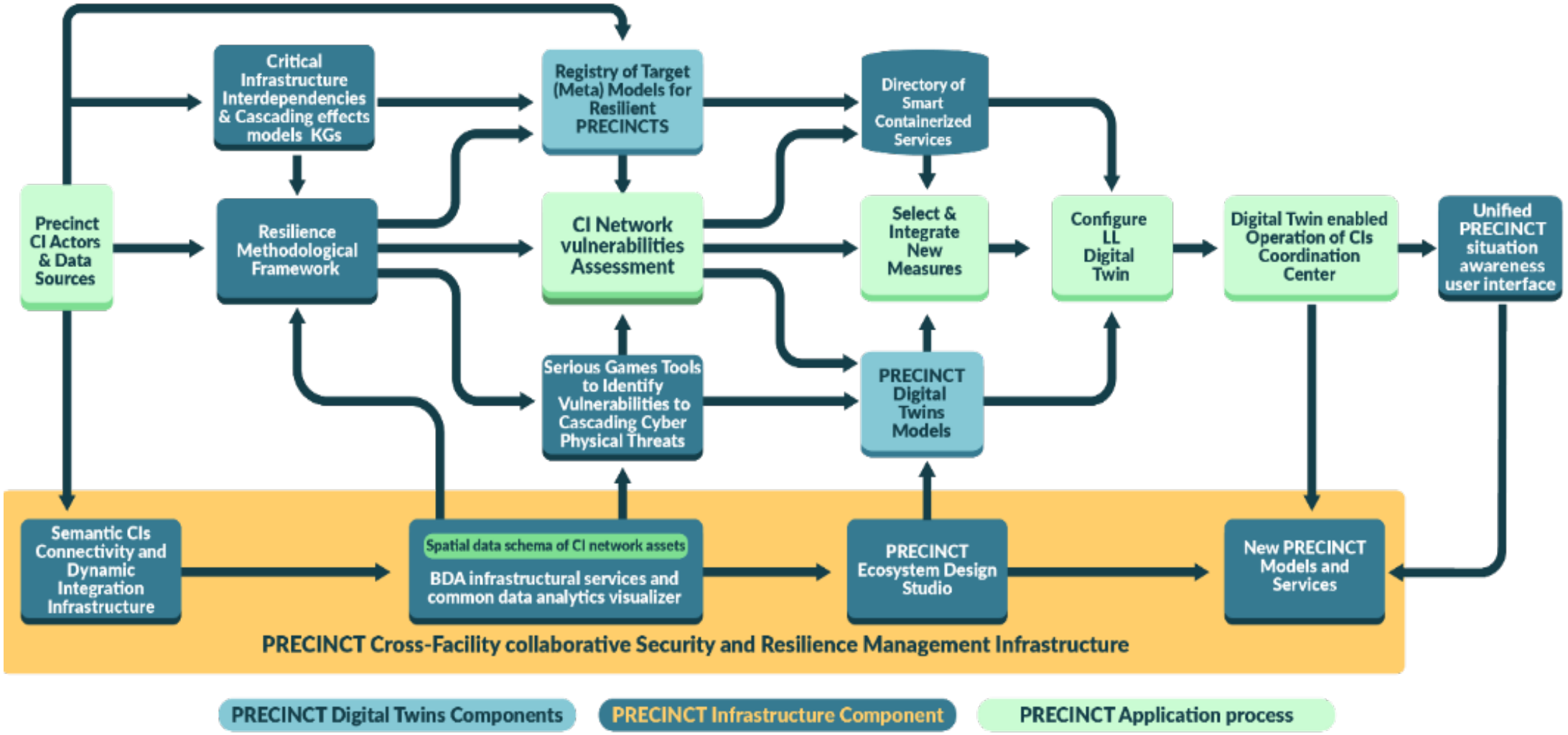
The implementation process for the LLs



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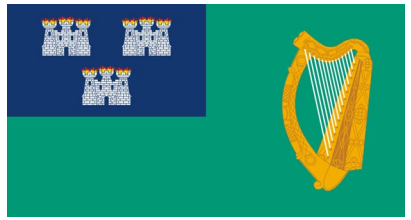
Transferability Demonstrators

- Luxemburg (Energy Tele-Communications focus)
  - investigation in integration of the PRECINCT DT with the ongoing development of the Luxemburg National DT.
- Dublin (Transport, Energy focus)
  - investigation of green transport city security /resilience implications.
- Uruguay
  - involving water, electricity and telecom CIs, will explore the possibility of establishing a Digital Twin - enabled National CIs Coordination Centre.



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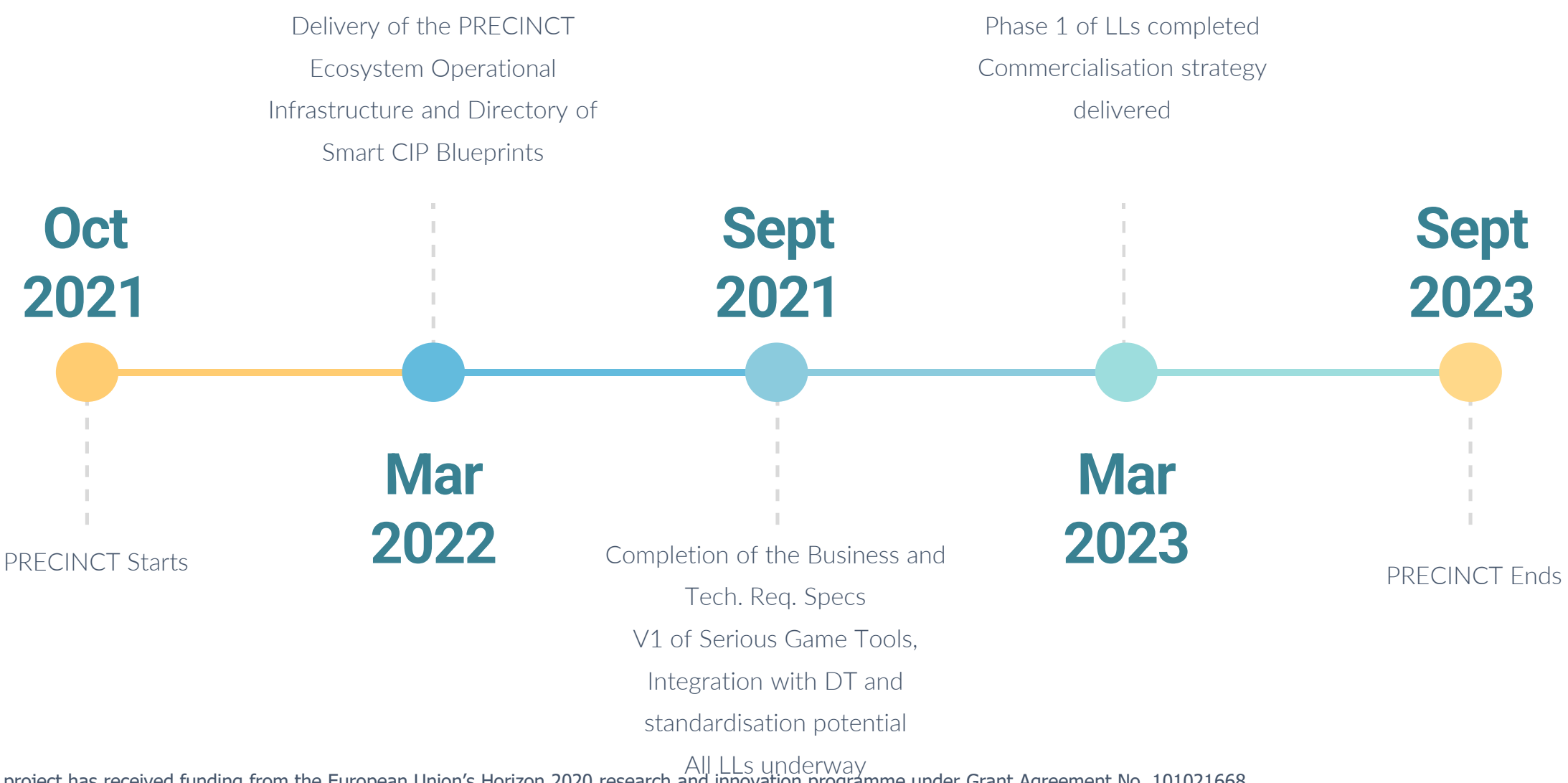

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Keep up to date with progress

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www.precinct.info

linkedin.com/groups/12552516/

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Thank you for you attention!

Inlecom

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