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Safe and Secure Smart Cities

Lasse Berntzen

About myself

- Professor in Information Systems at University of South-Eastern Norway
- Research on Smart Cities, Big Data, Data Analytics, IoT
- Some recent work on drones (will get back to that)
- Former project manager for BIBIKT (Better Inter-municipal Fire Department through ICT)



Affiliation: USN Center for Security, Crisis Management and Emergency Preparedness

<https://www.usn.no/research/our-research/economy-management-and-politics/center-for-security-crisis-management-and-emergency-preparedness/>

Smart Cities

- The **smart city** is a concept with no unified definition, but:
- Technology plays an essential role
- The main objective is to improve the quality of life for its citizens
 - Provide better services
 - Reduce environmental footprint, sustainability
 - Facilitate participation

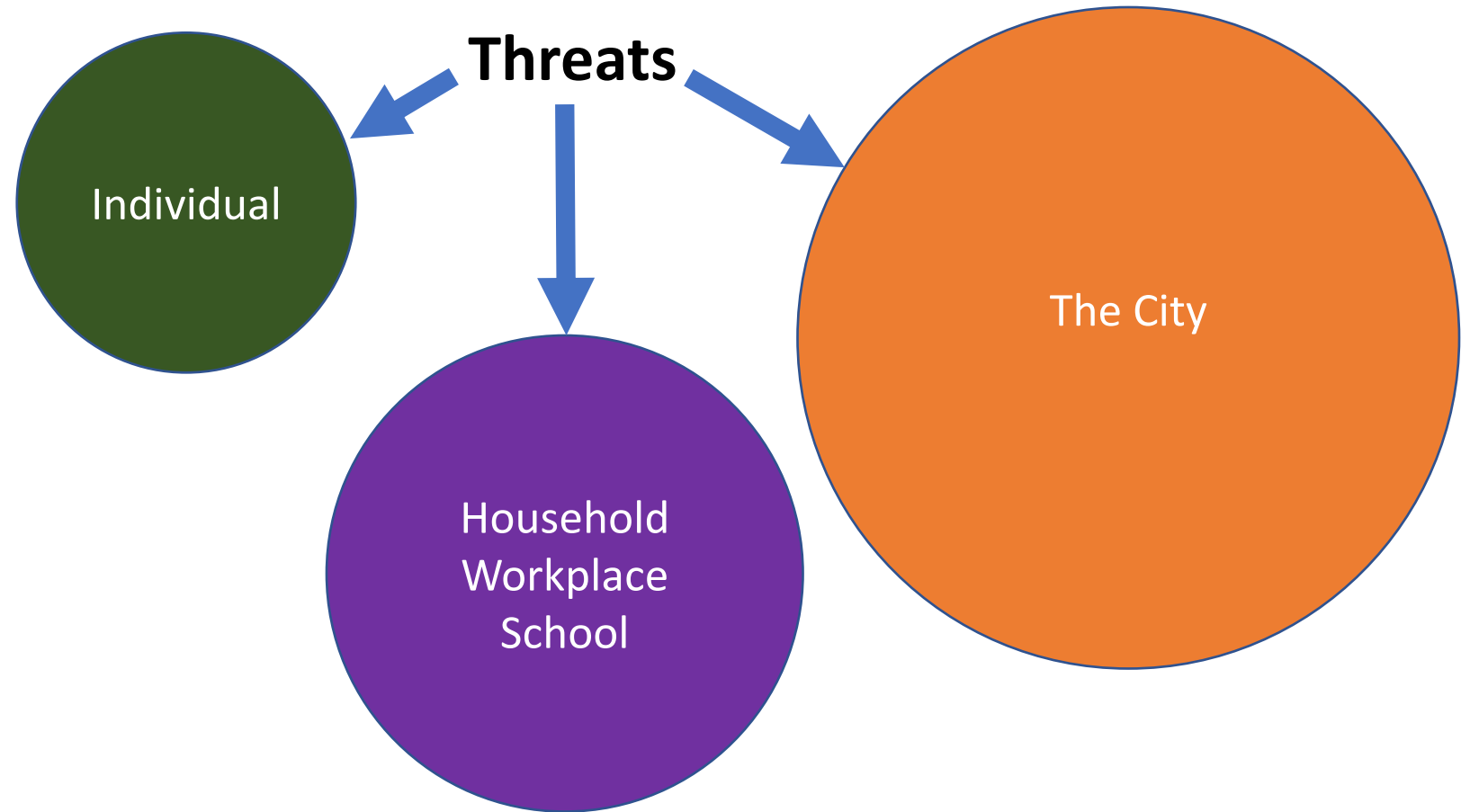
Safe and Secure Smart Cities

Safety and security
are often mentioned
in the context of
smart cities



Safe and Secure from what?

- Starting with the threat landscape
- What are the threats against individuals, households, workplaces, and schools?
- What are the threats against the city?



Threat Landscape

From smaller incidents to major ones

Urban crime

Accidents

Environmental disasters

Pandemics

Catastrophes

Terror attacks

Acts of war

Planning and Training

- Preparedness on all levels
- Planning must focus on the capacity to handle emergencies
- Organizations must train to be agile, to easily adopt to new situations
- This is the way to achieve resilience
- Example: School shootings. A school shooting is a case, but procedures and actions should be applicable for a wide range of incidents

Safety and Security

Individuals

Awareness
Competence

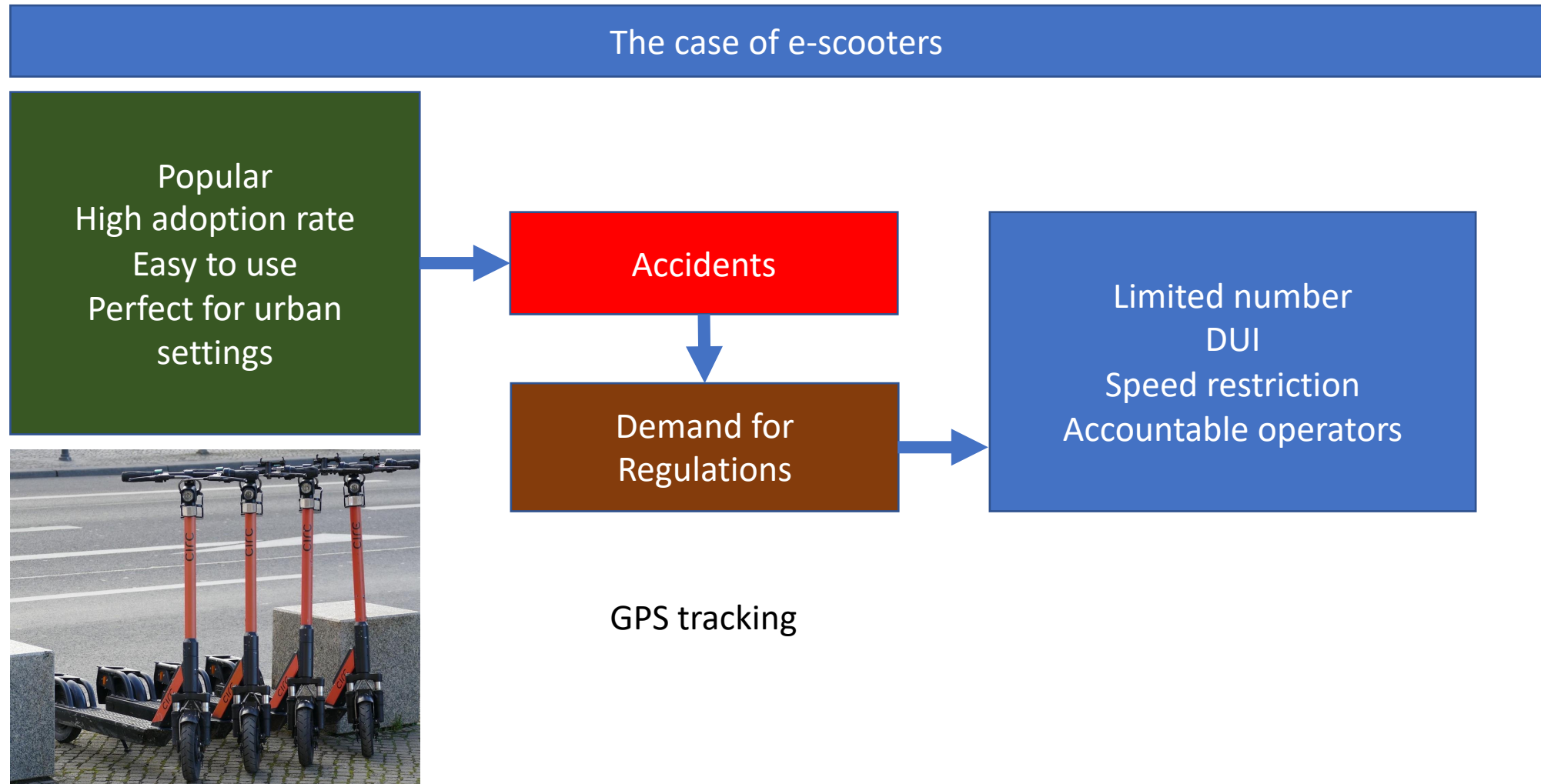
Technology

Detection
Prevention
Recovery

Organization

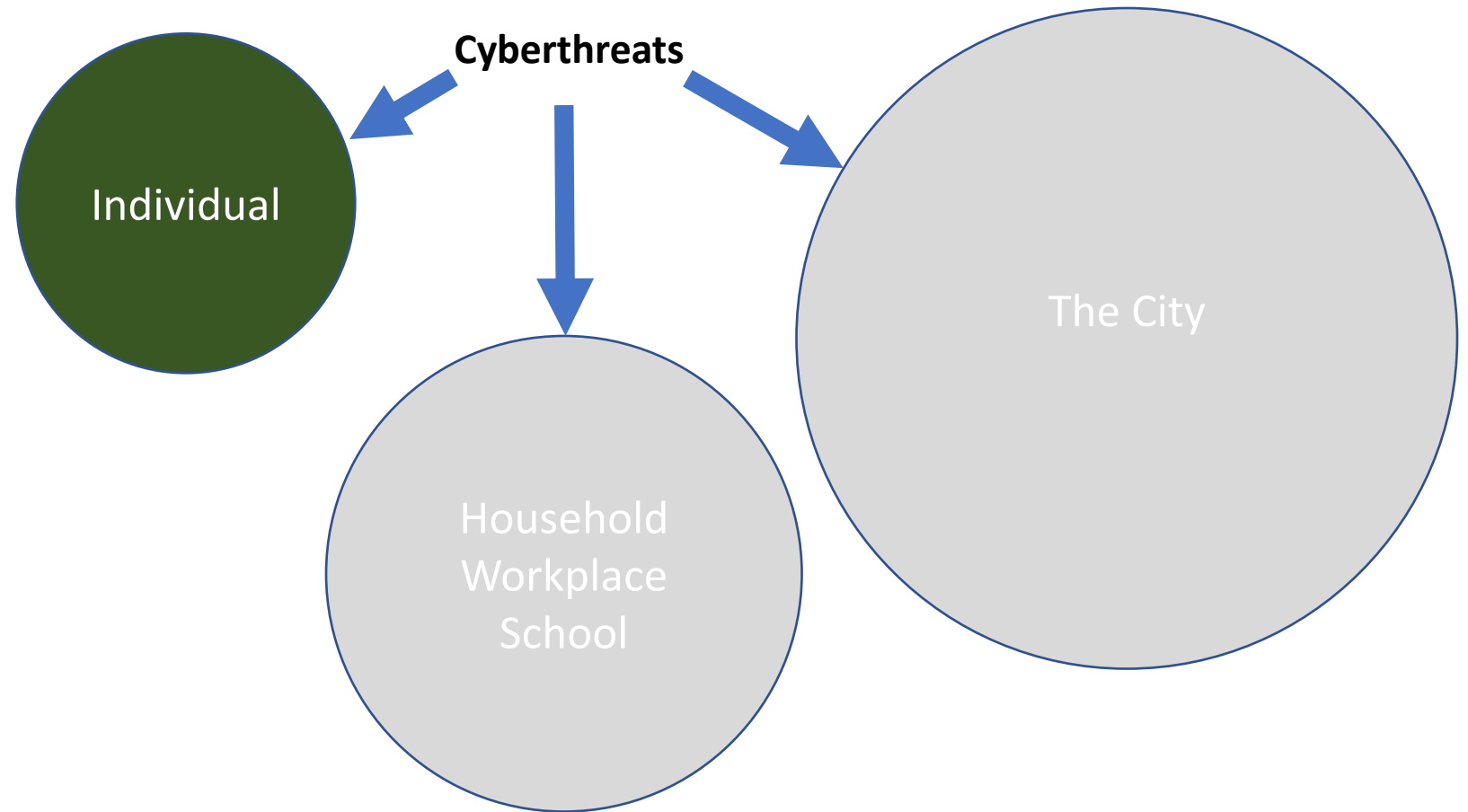
Regulations
Procedures
Guidelines
Planning and training

Safe and Secure in Daily Life



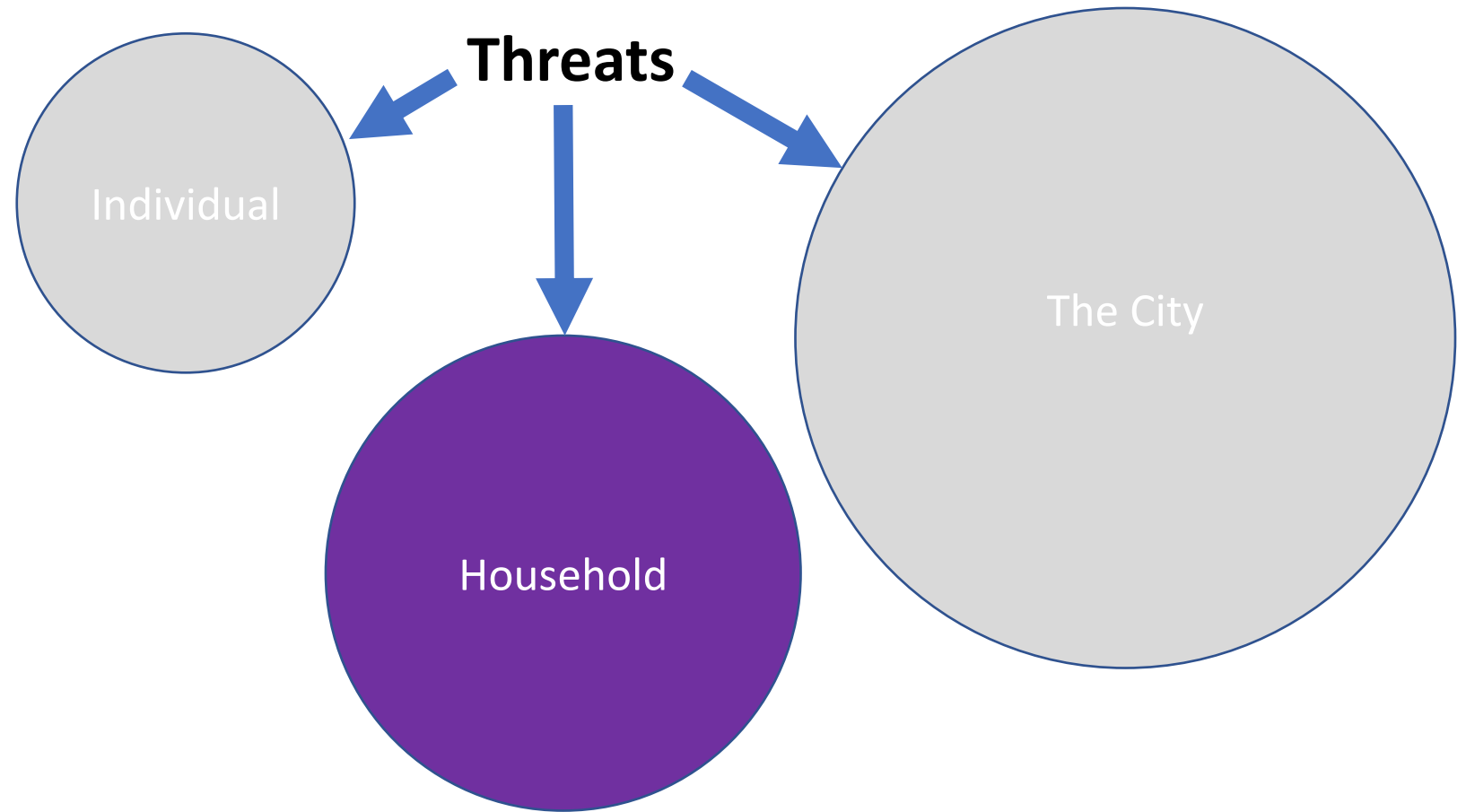
Cyberattacks Happen Everywhere

- Mobile phones
- Tablets
- Smart watches
- Personal computers



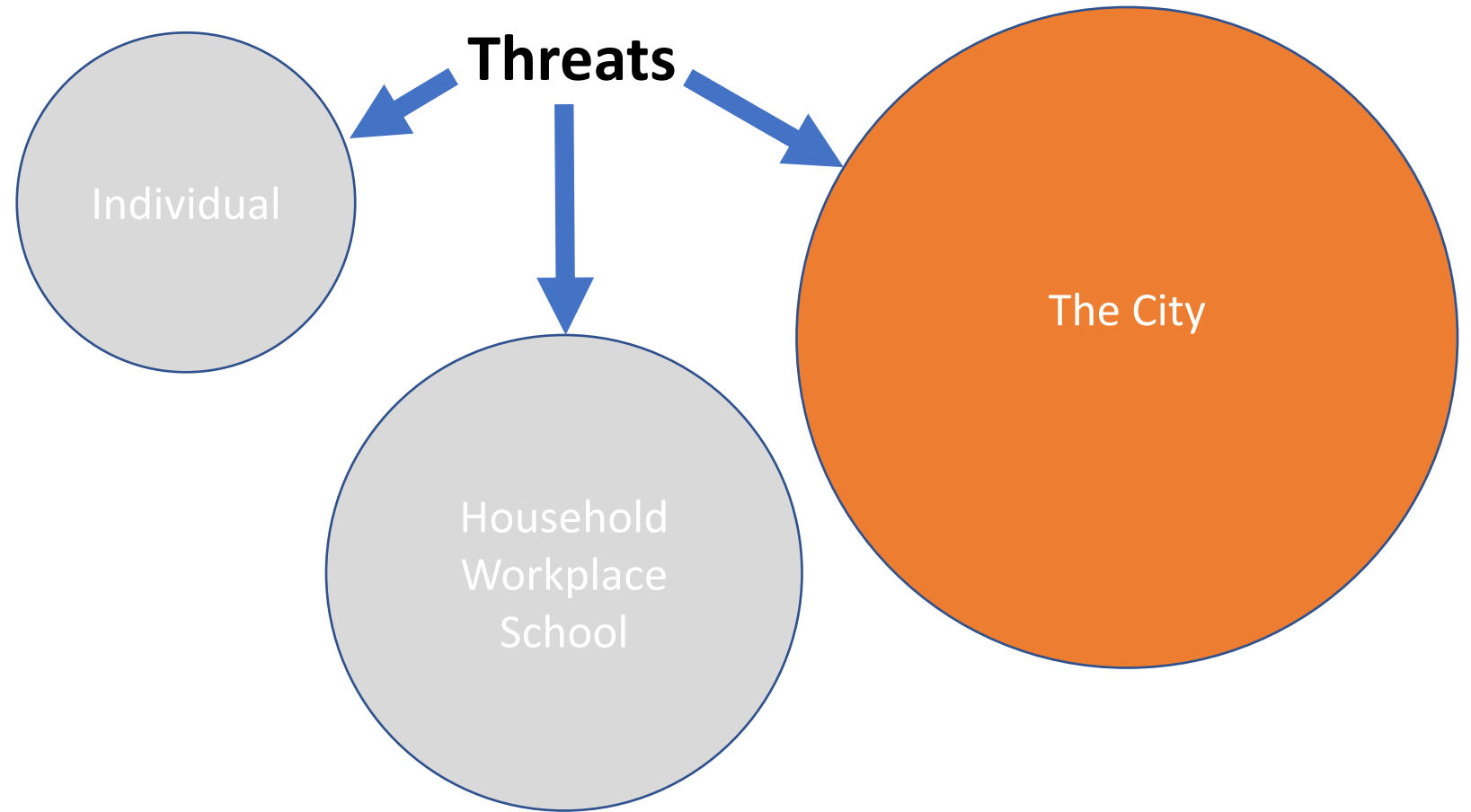
Cyberattacks Happen Everywhere

- Smart energy meters
- Smart appliances
- Home healthcare systems
- Home security systems



Safe and Secure from what?

- Critical infrastructure
- Administrative systems



The City and Cybersecurity

- Information systems are vital for efficient city management
- Cyberattacks may disable critical systems
- What are the most critical systems in the city?



Critical infrastructure

Energy

Communication

Water

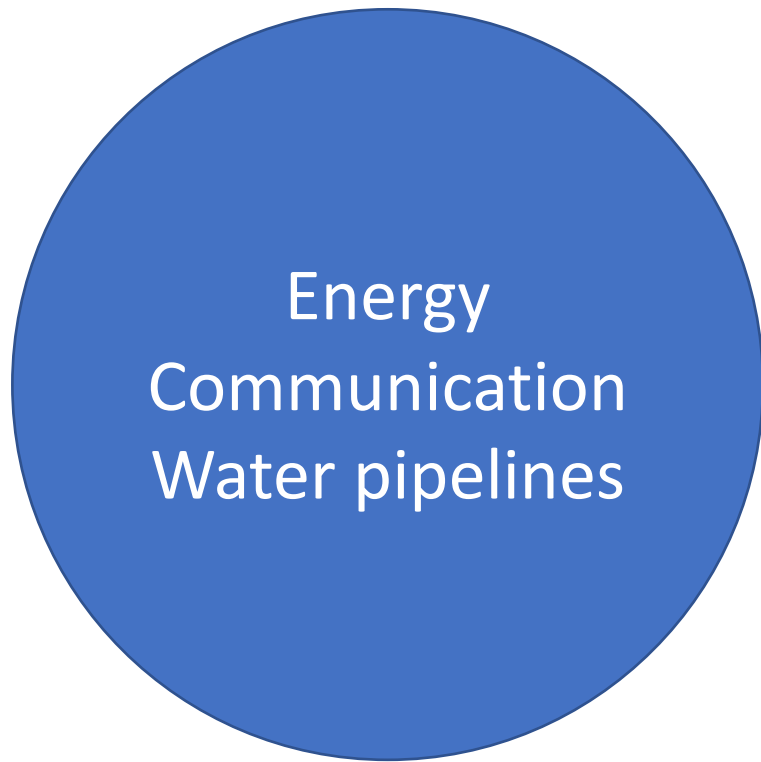
Traffic management

Sewage/waste

Emergency services

Medical information systems

Physical Threats



The long distances inherent in power transmission systems, pipelines, and utilities leave remote locations exposed.



Need for physical protection, monitoring, and surveillance

Two often
overlooked
threats

Hardware
hacking

Denial of
Service

Hardware Hacking +

To physically destroy components by cyberattacks

Overheating circuit breakers or transformers

Destroy control units

Disable sensors

Jam radio signals



Denial of Service - Jamming

- Denial of service is easy to implement
- No need to break into a system
- Just overload the reception side
- Jamming is also a kind of denial of service
- Drone jammers
- GPS jammers

Critical Infrastructure

Isolation

Protection

Redundancy

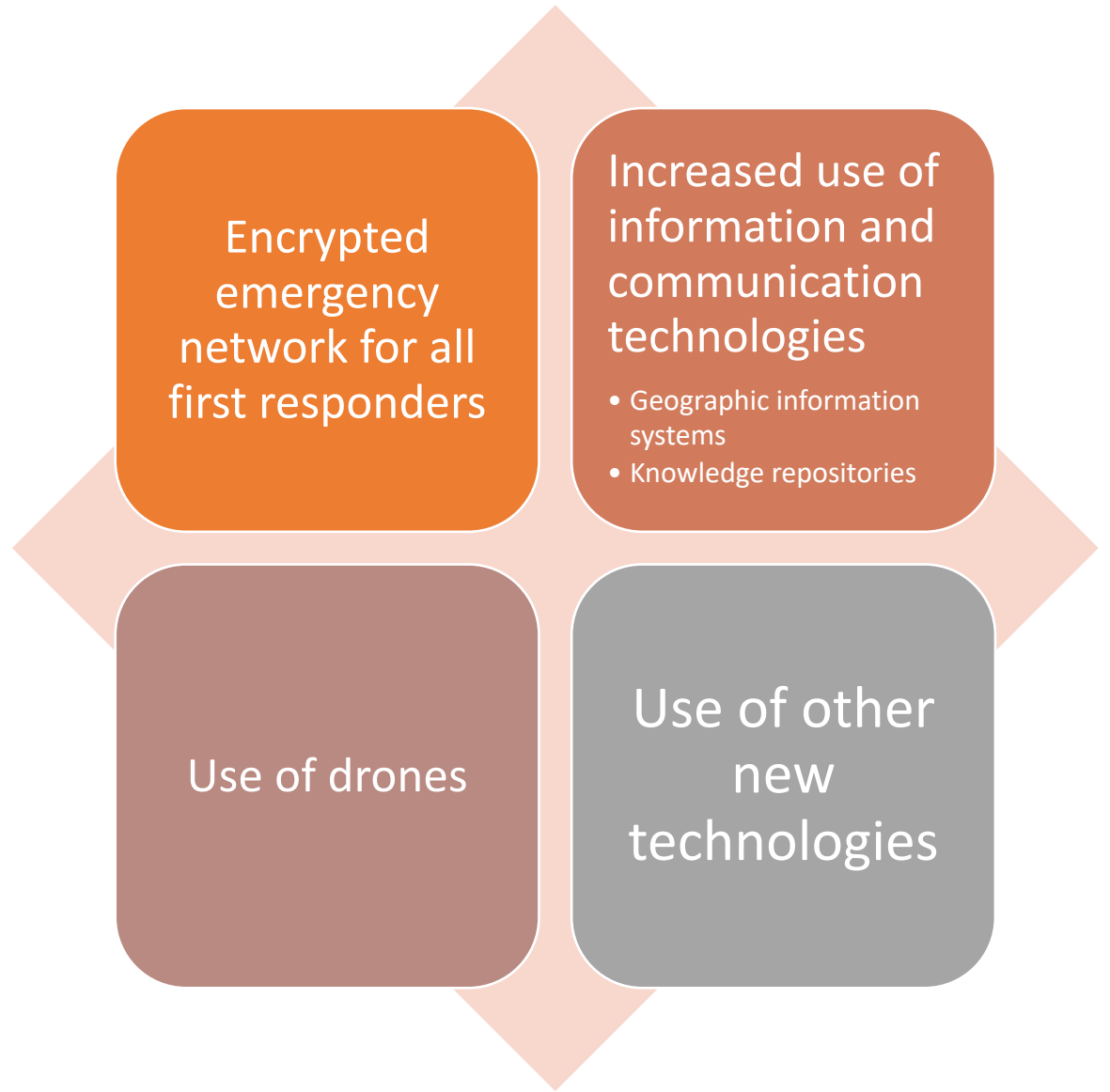
Emergency Services

First responders: Fire department, ambulances, police

Increased complexity, new challenges

Need for collaboration across boundaries

Technology Impact



Drones

Heart-starter delivery
(Sweden)

Last mile delivery
(e.g. medicine)

Time-critical
transport

Surveillance

Search and Rescue



Drones have a lot of potentials, but also introduce new risks
Drones are airborne and may fall down

Ethics

- A Smart City has a lot of opportunities to use technology to improve safety and security
- But technology comes with dilemmas
 - Tracking electronic footprints (mobile, payment cards)
 - Number plate recognition
 - Facial recognition
 - Prediction/forecasting
- Possible false positives
- “Minority report” (movie)

How to Increase Competence

Training for
employees
(awareness)

IT security team
(more than
technology)

Research

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Thank you for listening

lasse.berntzen@usn.no