LUCRAM

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Security after 11 September

Risk and Vulnerability
Characteristics
Swedish Research Programme

Background

- 11 September 2001 New York
- Loss of power supply New York, London, Rome and Sweden/Denmark
- SARS, MCD
- Flooding in Central Europe
- Flooding in Sweden
- Seveso, Bhopal

Background (2)

- Storms in Sweden 2004
- Drinking water contamination 2001
- Explosion at a fireworks depot
- etc

Lessons

- **Direct impact local or regional**
- **Indirect impact national or transnational**
- **Direct impact analysed**
- **Indirect impact greater than direct**
- **Coordination?**

Swedish Administration

- New legislation 2002:472
- ”Åtgärder för fredstida krishantering och höjd beredskap”
- Yearly report on risk and vulnerability required from all national authorities
- Some (6) have direct responsibility for coordination

Requirements

- **A: are all risks and vulnerability to society identified?**
- **B: Are there sufficient competence and resources available?**
- **C: Are the coordination among relevant actors appropriate?**

Observations

- **Indirect impact known – planning lacking**
- **Focus on technical issues – organisational lacking**
- **Coordination across areas insufficient**
- **Shortcomings in competence and resources**
- **No clear responsibility across areas**

Framework Program for Risk and Vulnerability Analysis (FRIVA)

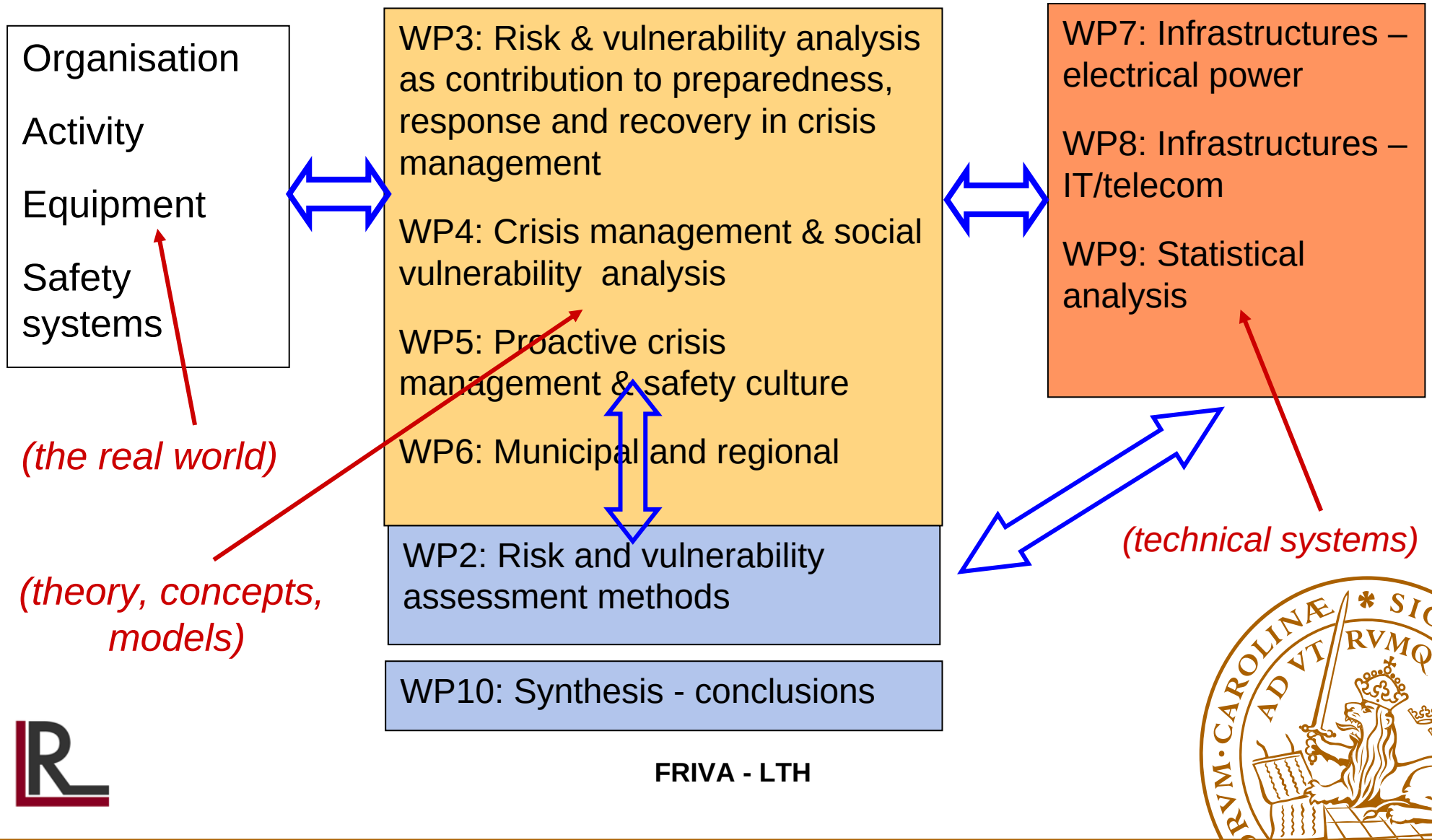
- **Integrated framework research programme**
- **10 sub-projects – start 1 March 2004**
- **Financed by SEMA, The Swedish Emergency Management Agency**
- **SEMA coordinates, on a national level, the society's actions to manage preparedness for severe emergencies**

Objective of FRIVA

Risk and vulnerability modelling, assessment and management of interdependent critical social and technology infrastructures:

- **Extend and improve the national competence**
- **Analysis from multiple perspectives.**
- **The role of system dynamics modelling; statistics of extreme events**
- **A long term objective will be to analyse modelling of interdependencies of critical infrastructures**

LUCRAM - FRIVA



Research Topics

- Complex Systems Analysis
- Network theory
- Dependencies
- Agent-based modelling

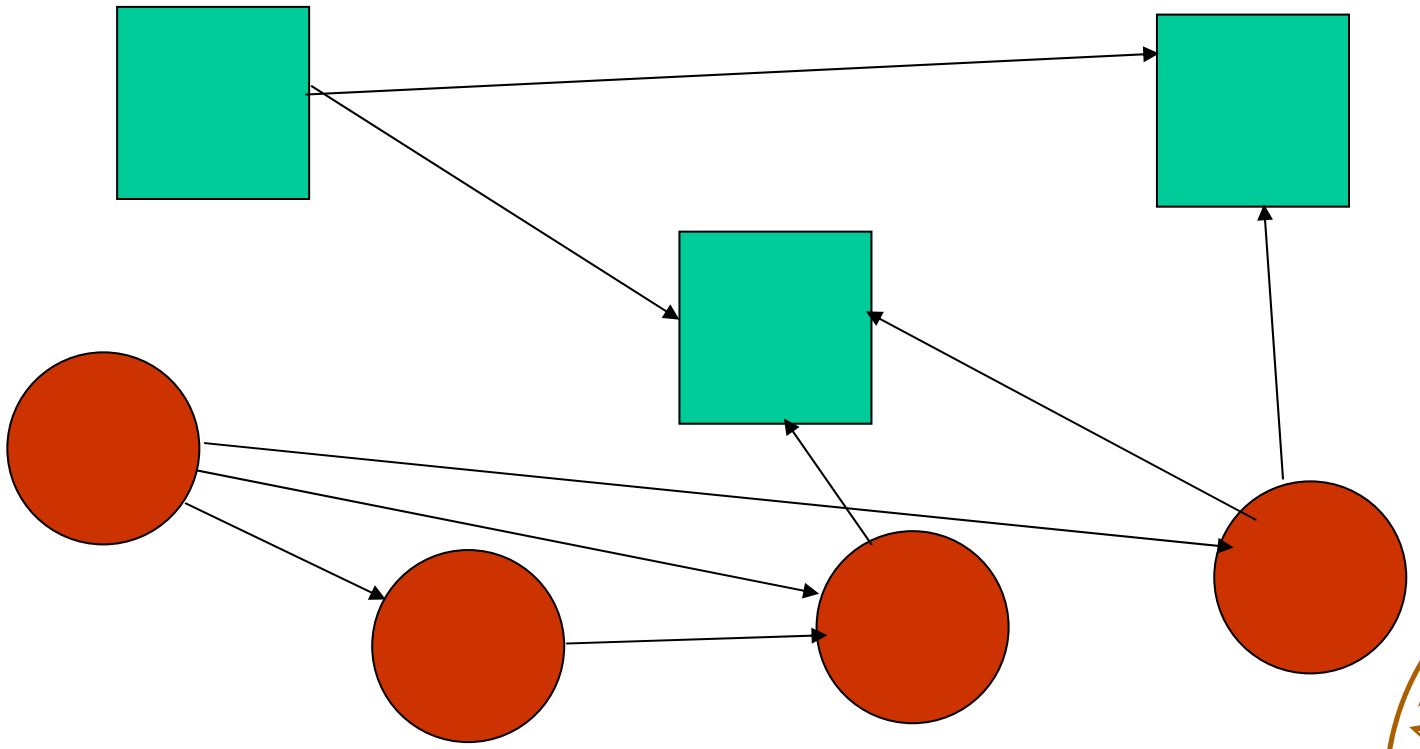
Network Theory

- Technical networks
- Information networks
- Social networks
- Biological networks

Network Theory (2)

- Dependencies
- Structural and dynamic characteristics
- Linkages between networks

Networks



Modelling

- **Agents**
- **Dynamic relationsship**
- **Complex system simulation**