



Crisis and Risks Engineering for Transport Services



Co-funded by the
Erasmus+ Programme
of the European Union

July 8, 2022

**Warsaw University
of Technology**



What is the *crisis* and *risk*?

...a time of great disagreement, confusion, or suffering

...an extremely difficult or dangerous point in a situation

...experiencing a time of great difficulty, danger, or suffering

...**a moment during a serious illness when there is the possibility of suddenly getting either *better* or *worse***

...the possibility of something bad happening

...danger, or the possibility of danger, defeat, or loss

...to put something in a situation where it could be lost or damaged





The new crisis in transport

2018

Global transport when we have started

- Stable development of supply chains for 80 years
- Supply chains driven to the limits
- Stable economic growth
- Agility and inventory minimization
- 10 years since the major financial crisis
- Global transport projects
- Decarbonization as the basic political problem
- Weather phenomena: hurricanes, droughts

2022

Global transport now

- **After-pandemics issues**
- **War acts and terrorism**
- Ecological issues and elimination of fossil fuels
- Inflation
- Economic crash (world crisis)
- China vs USA
- Global shortage of raw materials
- Bottlenecks (channels, ports)
- Technological shifts: Industry 4.0, combustion engines
- Weather phenomena: hurricanes, droughts

?

Future global transport?

- No alternative to electric vehicles?
- Destructive weather phenomena?
- Geopolitical situation?
- End of fossil resources?
- Depopulation / overpopulation?





The new crisis in transport



Imbalance between supply and demand – production delays
Shortage of key raw materials and logistics services
Broken supply chains (bottlenecks) and contracts
Semiconductors – "crude oil of the 21st century"
International politics
Financial crises
Insulation
Lack of drivers or specialists
Pandemic recurrences (in China)
The global container crisis

Pandemic
(new threats and new scale of challenges)



Assessment and modernization of supply chains and transport processes
Rethinking supply chains may revise logistics patterns
Inventory rationalization
Diversification of partners in supply chains
Development of e-commerce and last mile processes
The demand for logistics space
Increased investment in digital technologies and Industry 4.0
Nearshoring





The new crisis in transport

- The weakening economic and trade outlook flattens the demand for goods
- Soaring inflation
- Consumers in Europe have revised their purchasing expectations downwards
- Shortage of gas for production industry
- Soaring fuel costs
- Higher prices of raw materials and transport equipment
- Airspace closure and restricted land capacity, change of shipping (sea) routes, removal of Russian carriers, avoiding Eurasian railways
- Severe changes in the supply of grain to other countries as a result of the illegal Russian blockade
- Attempts to shift grain exports from Ukraine to/through Europe by rail

War acts
in Ukraine
(new threats
and new scale
of challenges)





The new crisis in transport

European Commission Contingency Plan for Transport (May 2022)

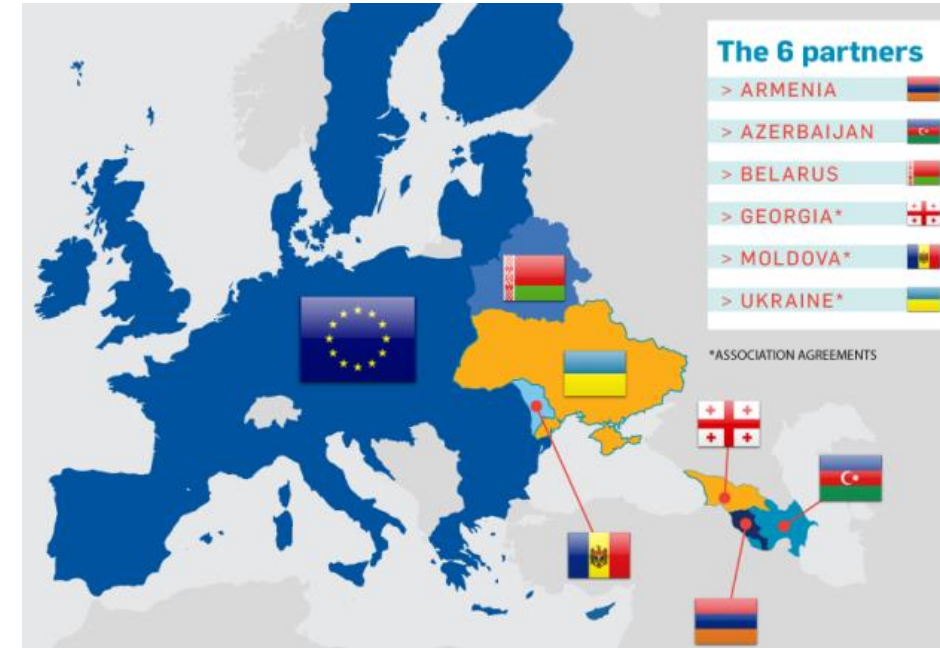
- Making EU transport laws fit for crisis situations
- Ensuring adequate support for the transport sector
- Ensuring free movement of goods, services and people
- Managing refugee flows and repatriating stranded passengers and transport workers
- Ensuring minimum connectivity and passenger protection
- Sharing transport information
- Strengthening transport policy coordination
- Strengthening cybersecurity
- Testing transport contingency
- Cooperation with international partners





CRENG – the answer to a problem

- Risk and crisis engineering for transport service is today critical for societies and global economy.
- CRENG MA programs in universities of France, Germany, England, Norway, etc.
- Ukraine, Azerbaijan, Turkmenistan located on **strategic transport routes**.
- EU supports integration of UA, AZ (Eastern Partnership) and TM (Central Asia) transport systems.
- 11 UA, 5 AZ and 3 TK HEIs annually train 250, 80 and 50 specialists in Transport Technologies (**none on CRENG**).
- **The project meets strategies of PCs** in transport services and higher education. This fact is proved by legislative acts.



Source: EU/EEAS



Co-funded by the
Erasmus+ Programme
of the European Union



CRENG study program

Crisis and Risk Engineering in Transport Systems: New Core Curricula

1. New technologies and big data for innovations in crisis and risk management + IT Security
2. Risk and crisis forecast, Analysis and Reduction Methods and Tools
3. Simulation of complex transport processes and systems that operate in conditions of risks
4. Human Factors in Design & Operations
5. Humanitarian logistics and transport services in disasters conditions
6. Informational-Analytic and Diagnostics for Sociotechnical System
7. Risk and crisis engineering of Transport systems
8. New challenges for crisis and risk management in logistics systems
9. Supply chain management and networks
10. Health, Safety & Environmental Management Systems





CRENG study program

Crisis and Risk Engineering in Transport Systems: New Transferrable Curricula

1. Project management and leadership in logistics and research, through open communication and team-working
2. Research methods and professional development
3. Carrier Managing, Soft skills for engineers, basics of technical creativity





CRENG Work Packages milestones

Development of new MA program “CRENG ” and innovative teaching environment:

- New core and transferable curricula on CRENG
- E-learning courses on MOODLE platform in PCs HEIs
- Retraining program on new curriculum on CRENG by EU HEIs
- Teachers retrained on new MA programs and teaching/learning environment at EU HEIs
- Teaching materials for each new curricula (Join Web Platform);
- Laboratories at PCs HEIs
- Master classes on new MA program conducted by retrained PCs teachers an EU HEIs;
- Pilot teaching
- Staff from PCs HEIs retrained to operate CRENG Service Offices
- MA program “CRENG” accredited on institutional and national levels
- CRENG Service Offices
- CRENG + Agreement
- Skills Wallet and IPBL implemented at PCs HEIs





Warsaw University
of Technology



Faculty
of Transport

WARSAW UNIVERSITY OF TECHNOLOGY

Thank you for attention!

www.creng.eu



Co-funded by the
Erasmus+ Programme
of the European Union

Dr. Konrad Lewczuk
Faculty of Transport, WUT
CRENG project manager

www.creng.eu
www.facebook.com/CrengErasmus/