

Transportation Resilience and Accessibility in Crisis

ENSURING RELIABLE TRANSIT DURING
EMERGENCY SITUATIONS

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Challenge Summary: Introduction

Transportation systems are vital for civilian and defence operations, particularly during crisis events.

Crisis events can disrupt critical infrastructure, hinder emergency response and impede military logistics.

Geographical Challenges

Greece's rugged terrain and dispersed islands create complex barriers for transportation continuity during emergencies.

Impact of Disruptions

Transportation disruptions delay emergency responses, hinder evacuations, and obstruct defense logistics in crisis situations.

AI-Powered Solutions

Innovative AI-driven, dual-use transportation solutions enhance adaptability and autonomy in disrupted environments.

Advanced Technologies Integration

Use of geospatial intelligence, autonomous systems, and resilient communications ensures mobility and logistics continuity.

Challenge Summary: Introduction



The HCDI seeks innovative, dual-use solutions that:

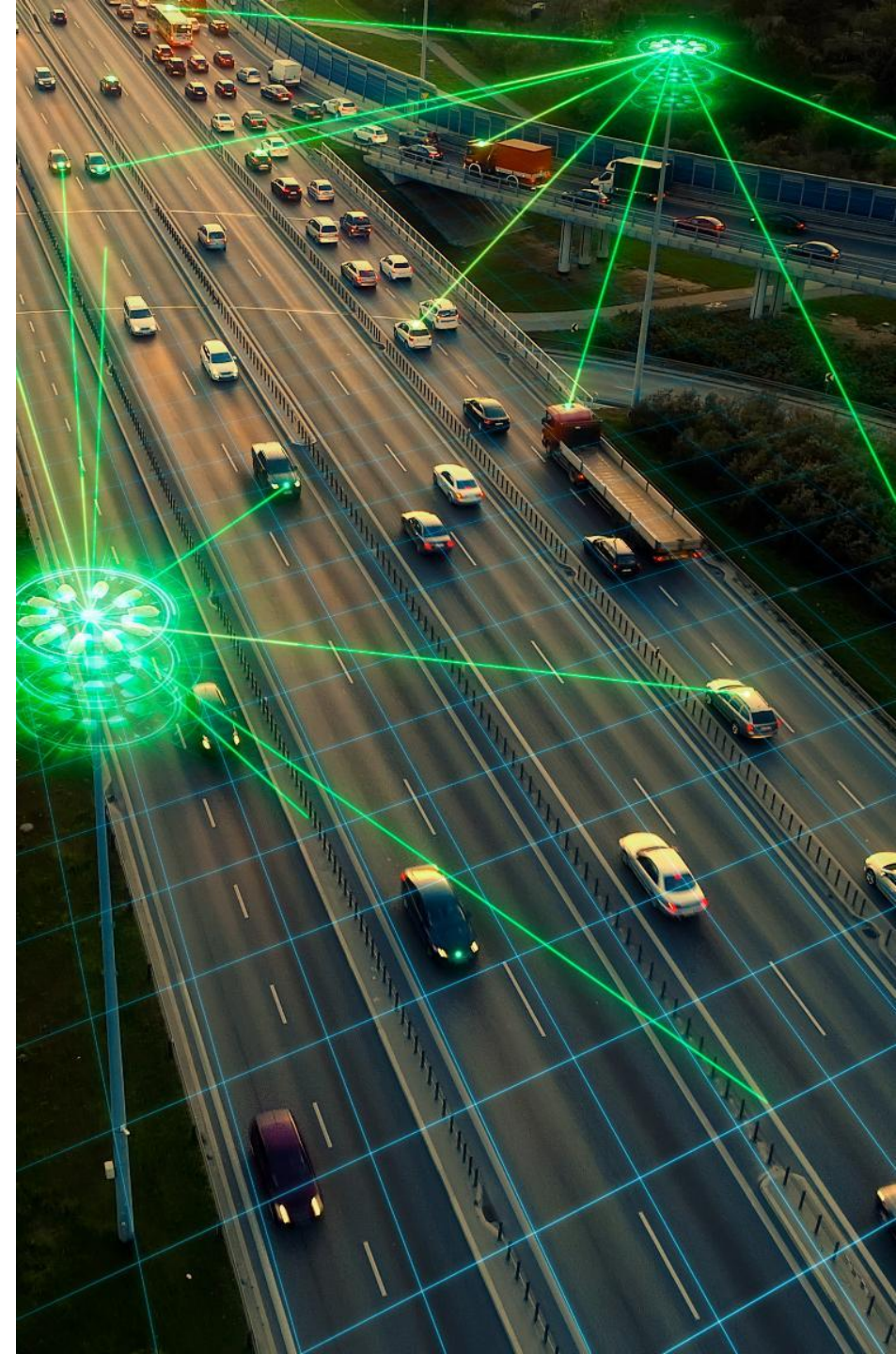
- enhance the resilience and accessibility of transportation systems during crises,
- leveraging geospatial technologies, advanced communications, and autonomous systems

to ensure rapid, secure, and efficient mobility for civilians and defence forces in contested or disrupted environments.

Exemplar Enabling Technologies:

1. Geospatial and Surveying Technologies

- Advanced geospatial analytics for real-time mapping and damage assessment of transportation infrastructure.
- Satellite-based remote sensing and LiDAR systems for monitoring road, port, and airstrip conditions in crisis zones..
- AI-driven platforms for integrating geospatial data with transportation logistics, optimizing routes in disrupted environments.
- Portable surveying tools for rapid assessment of terrain and infrastructure accessibility post-crisis.



Exemplar Enabling Technologies:

2. Autonomous and Resilient Transportation Systems

- Autonomous drones and unmanned ground vehicles (UGVs) for delivering supplies and conducting reconnaissance in inaccessible areas.
- Modular, rapidly deployable transportation platforms (e.g., temporary bridges or floating docks) for maritime and coastal regions.
- AI-based traffic management systems for real-time rerouting of civilian and military transport during crises.
- Energy-efficient propulsion systems for autonomous vehicles, optimized for long-range operations in remote areas.



Exemplar Enabling Technologies:

3. Communication and Integration Technologies

- Resilient communication systems (e.g., O-RAN, satellite, or hybrid RF-optical networks) to support transportation coordination in contested environments.
- Interoperability solutions connecting civilian transport networks with military tactical communication systems.
- Edge computing for processing real-time transportation and geospatial data in areas with limited connectivity.
- Decentralized mesh networks for maintaining communication during infrastructure disruptions, enabling transport coordination.



Exemplar Enabling Technologies:

4. Secure and Adaptive Systems

- Zero-trust architectures for securing transportation management systems against cyberattacks.
- Post-quantum cryptography to protect data exchanges in transportation logistics and command systems.
- Blockchain-based systems for transparent tracking of supply chains and transport assets during crises.
- Adaptive AI systems for predictive maintenance of transportation infrastructure, reducing vulnerabilities in crisis scenarios



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