



From the draft ERTRAC-ALICE-ERRAC Integrated Urban Mobility Roadmap

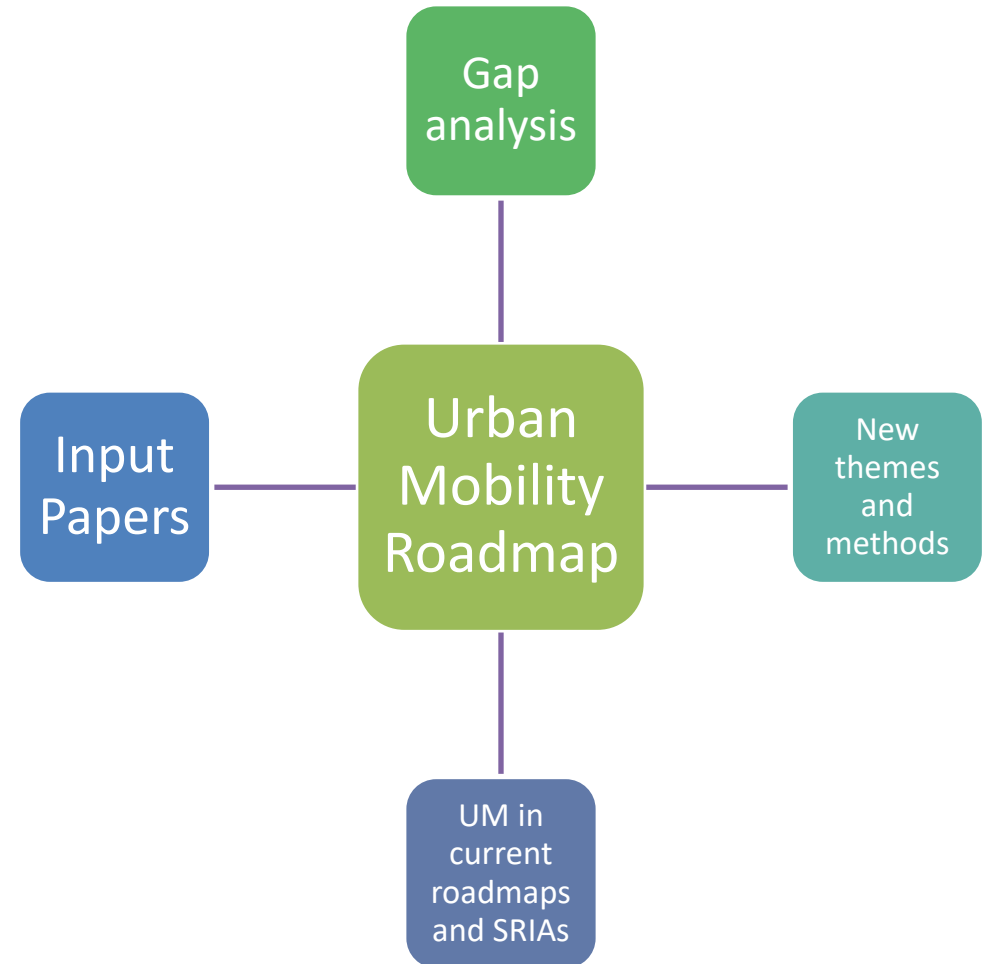
**Urban Construction
Mobile Non-Road Machinery**

**ALICE-POLIS webinar,
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The Urban Mobility Roadmap

- Update of the 2017 ERTRAC-ALICE-ERRAC urban mobility roadmap
- Technological advances, economic changes, actions and reactions to the marketplace, and societal trends and behaviours;
- Urban transport should be convenient, accessible, affordable, and resource-efficient for users, passengers and goods.
- Comprehensive and integrated perspective to identify research and innovation needs



- In the next slides there is draft text about construction logistics and mobile non-road machinery.
- The text has not yet been confirmed by the ERTRAC-ALICE-ERRAC working group, nor by the respective ETPs.
- The Roadmap will be finalised and proposed for approval by March 2024.
- If you would have comments, please share with mmeyer@polisnetwork.eu

Proposed text (draft) – rationale

Our urban areas are home to 75% of EU citizens. Urban areas consume over 65% of the world's energy globally, accounting for more than 70% of CO₂ emissions. Most cities are encouraging fossil-free mobility of people and goods, but the construction segment has often been neglected. The construction industry in Europe plays an essential role in the economy. Not only does it create new residential, industrial, and commercial buildings for Europeans to work and live in, but it also builds infrastructure and maintains and repairs older structures and buildings. In 2022, construction work in Europe made up between four and seven per cent of their GDP. In absolute numbers, the EU's construction revenue amounted to roughly 1.7 trillion euros in 2020, with specialised construction making up the biggest share of that turnover.

A significant and resource-intensive part of the construction process consists of transport to and from construction sites. Transports related to construction works make up a large proportion, 20-30%, of total urban freight transport. Only in Sweden, approximately 50% of urban transport is related to construction work, affecting city congestion.

Transport work carried out in the construction sector is often a forgotten environmental issue, accounting for about 10-15% of the entire transport sector's emissions (in the case of Sweden, up to 4–5% of Sweden's total CO₂ emissions), and this is forecasted to increase as a result of the urban development. In infrastructure projects, transport accounts for about 16% of emissions (Chang and Kendall, 2011) and filling materials make up the largest part of the ton-km transported by road in a region. In the Stockholm region alone, between 5 and 15 are generated million-tonne masses every year (Dalenstam, 2015)

Worksites are everywhere. They are needed to extract raw materials, build infrastructure and perform the urban transition towards smart cities. But worksites generate high amounts of GHGs and generate heavy disturbances: noise emissions, offensive smells (odour nuisance, olfactory pollution) and traffic jams in urban environments. Cities today are challenged not only by emissions and congestion but urban space also needs to be used more efficiently to be safer for vulnerable road users. Construction sites are hazardous, with constantly changing environments and many human / machine interactions.

The continuous urban development in European cities in the coming years demands efficient and fossil-free construction-related transports and building sites if European cities are to be fossil-free by 2030. Efficient and fossil-free construction work and construction transports in urban areas are essential for liveable and attractive cities.



Proposed text (draft) - outcomes

Project results are expected to contribute to the following outcomes:

- Optimised fossil-free transport network and traffic management for efficient transport flow to and from the construction site;
- New digital tools and services for optimised construction site control;
- Validated solutions for effective and secure data exchange across all modes of transports, infrastructure and construction work (vehicles as well as equipment, machines and infrastructure);
- Workable governance arrangements transport network and traffic management, in view of further supporting regulatory and policy actions;
- Tools and services to improve safety, security, resilience and overall performance of the construction work and transport;
- Digital traffic rules, smart traffic zones, V2X and C-ITS;
- Improved inventorying of energy consumed, pollutants and noise produced in construction sites;
- Refined profiles of actual operation and machinery technology stratification used across the EU.



Proposed text (draft) – R&I activities

This topic aims to demonstrate (IA, TRL6-7), through 1 to 3 use cases, the ability to conduct fully integrated, safer, connected and energy-efficient “rock to road” urban worksites. Demonstrations should be physical but could also be complemented with digital simulation environments.

The following R&I activities developing technical solutions and preparations for real environment demonstrators are proposed:

- Real-time connected trucks and machines fleet from raw material extraction to asphalt plant to road construction worksite with optimised and lean transportation and on-time delivery;
- Real-time connected worksites, transports and city infrastructure to decrease congestion – crossing infrastructure capacity data & visualisation of mobility flows;
- Improved environmental sustainability & circular handling of construction material through new functionality, services and logistics set-up, e.g. closeby loading & unloading areas such as Construction Consolidation Centers “CCC”;
- Increased safety on worksites with people & obstacles detection and classification in a dynamic environment, remote control/teleoperation or automated tasks in hazardous environments; safe entry/exit to worksite through smart technologies and interaction with worksite stakeholders and VRUs;
- Accident avoidance with augmented reality devices allowing to precisely locate underground networks (gas, electricity, water) when performing underground work;
- Sustainable off-road machinery and trucks with energy-efficient motion systems reaching the next steps beyond energy source replacement and overall neighbourhood disturbance reduction;
- Overall optimised process at complete worksite ecosystem level, specific tasks automation where relevant;
- Adjustment of worksites set-up to regional energy supply capabilities and infrastructures (electric grid, hydrogen supply, biomethane production, etc.);
- Interaction of worksites with energy supply infrastructures: vehicle-to-grid (V2G) / vehicle-to-X (V2X) capabilities, grid demand peak shaving, charging solutions integration.

Proposed text (draft) – relation to UM roadmap building blocks

Relevant policy drivers for this topic include:

- Climate neutrality
- Environmental policies: Zero pollution and zero waste, circular economy
- Land-use and transport interaction
- Just transition
- Digital transition as part of the twin (green and digital) transition (data governance)

This topic should use the following Research methodologies:

- Cities and districts as living labs
- Preparing Implementation: transferability, upscaling and capacity building
- Measuring impact, long term assessment of local R&I efforts
- Urban Mobility as sector of International Cooperation



Thank you for your attention!

