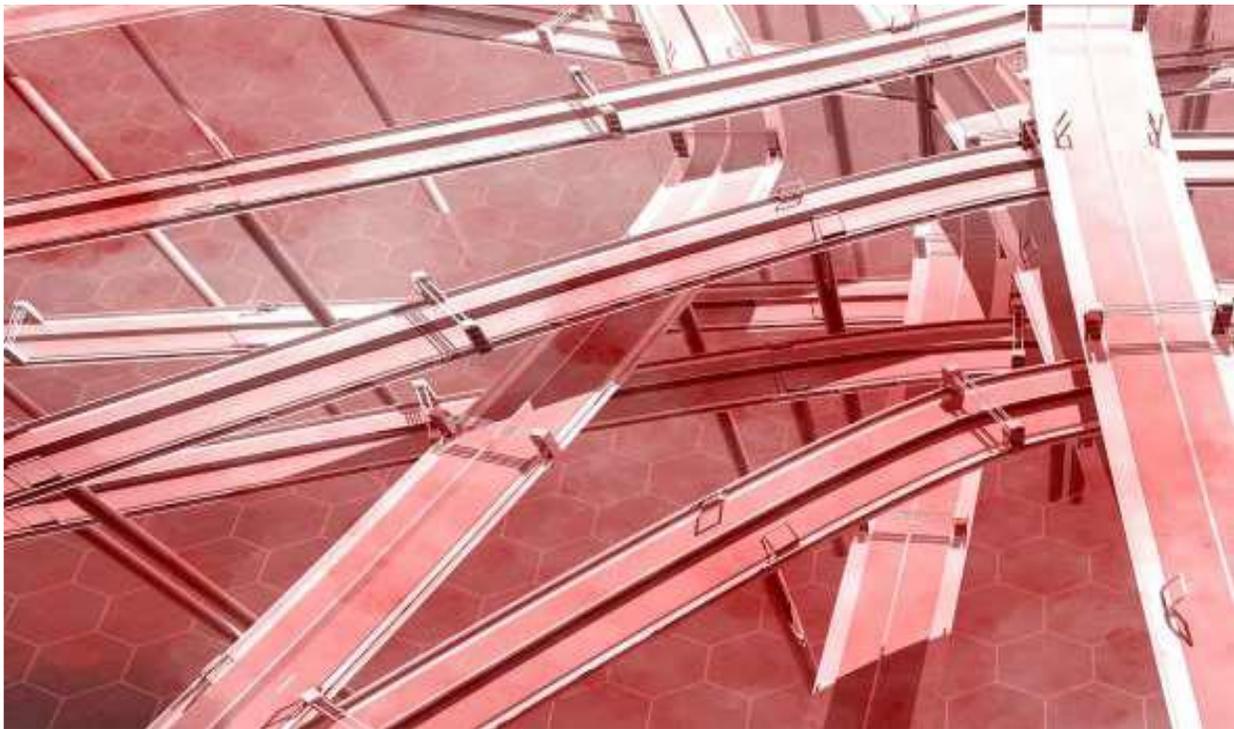




European Union
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RECREATE
REinforce Competitiveness of REgionAl
Transport SMEs
PGI05275
Policy Recommendations Report



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1. Introduction

SMEs currently employ 55% of the EU workforce in transport and their important role in the value chain is expected to expand. The rigid value chain of the transport sector is stifling the introduction of innovation by SMEs into new vehicles and transport-related products. SMEs (usually Tier 2 suppliers) find it difficult to interact with vehicle manufacturers, as they generally have short-term supply contracts to Tier 1 companies, who are strongly linked to specific large volume OEMs. Tier 2 SMEs have no collective voice or influence at European level and the EU is not taking advantage of or supporting directly the thriving innovative companies in this sector.

1.1. *RECREATE project*

RECREATE project will address this market failure and focus on the opportunities that new markets offer to innovative and dynamic transport SMEs through the adoption of regional support schemes. It will improve the capacity and capability of regional transport SMEs to further development and growth. This includes support for: 1. Research and Development 2. Rapid development and implementation of products and services 3. Access to finance schemes 4. Internationalisation opportunities. The project adopts a holistic approach to SME support by improving all the relevant schemes that could potentially deliver growth to the regional transport SMEs. Recognising the importance and the potential of the transport SMEs in the economies of the regions involved, RECREATE will map transport SME support measures and assess their effectiveness. The integrated approach adopted by the RECREATE project will drive the identification and development of support mechanisms in the transport SME sector and it will ultimately deliver Action Plans and policy recommendations for evidence-based policy improvement.

1.2. *Strategic framework to transport SMEs support*

SMEs are the backbone of Europe's economy. They represent 99% of all businesses and in the last 5 years, they have created around 85% of new jobs and provided two-thirds of the total private sector employment in the EU. The European Commission considers SMEs as a key for ensuring economic growth, innovation, job creation, and social integration in the EU. The European Commission provides support for SMEs in different fields. At the centre of the Commission's actions is the Small Business Act for Europe that provides a comprehensive SME policy for the EU and EU countries and promotes entrepreneurial spirit among European citizens. The Commission also has a priority to ensure that enterprises can rely on a business-friendly environment and make the most of cross border activities, both within the EU single market and outside of it. Access to finance is the most pressing issue for many small enterprises so the EC works to improve the financing environment for SMEs and provides information about funding. SMEs can apply for European Commission funding programs such as CEF, which finances projects related to energy, ITC, and transport, or COSME which aims to improve SMEs access to finance and markets through financial instruments. In general, EU policy for SMEs aims to ensure that Union policies and actions are small business-friendly and contribute to making Europe a more attractive place to set up a company and do business. Promotion of competitiveness and innovation are the key aspects of EU policy in relation to industry and SMEs.

1.3. About this document

The purpose of this document is to present the joint Policy Recommendations (PRs), that were prepared as part of the RECREATE project. Each partner was responsible to prepare policy recommendations for their regions, and as a result, this document involved all regional policy recommendations provided by the partners, and it also draws the conclusions and recommendations based on this information.

A Policy Recommendation is written policy advice prepared for some group or person who has the authority to make a decision or to influence policy decisions. Policy recommendations serve to inform people who are faced with policy choices or particular issues on how to make the best decisions. It is about using research and evidence to advocate change.

In general:

- a PR document should provide enough background information for the reader in order to understand the current situation and how it results in the existing issues;
- a PR should provide enough information to convince the reader that the problem has to be addressed as soon as possible;
- a PR should identify alternative solutions for the described issue;
- the best policy option should be selected based on analysis and evidence;
- the policy recommendations should provide a solution to existing issues.

1.4. Structure of this document

Policy recommendations document is structured in 8 parts. Except from the first one (introductory), chapter 2 outlines the methodology applied to prepare relevant and valid recommendations on transport related themes, highly important for the regions involved in the RECREATE project; in chapter 3, policy recommendations for the West Midlands region are presented; in chapter 4, policy recommendation for the South-Aegean region are presented; chapter 5 presents policy recommendations for Lithuania; chapter 6 is dedicated to the policy recommendations for South-West Oltenia region; part 7 presents the analysis of the suggested policy recommendations; part 8 outlines the overall conclusions.

2. Policy recommendations methodology

Within the framework of the RECREATE project, the policy recommendations will be aimed at improving all the relevant schemes that could potentially deliver growth to transport SMEs. These include support for:

- Research and development;
- Rapid development and implementation of products and services;
- Access to finance schemes;
- Internationalisation.

The preparation of recommendations document follows the methodology, which was created by the Lithuanian Innovation Centre in consultation with other project partners and their input (Coventry University Enterprises Ltd., Development Agency of South Aegean Region, Regional Development Agency South-West Oltenia). The methodology of the policy recommendations and its main principles are presented in the table below.

Table 1. Recreate Policy Recommendations methodology

Part	Question to be answered
Executive summary	What are the main points I want policymakers to understand – even if they don't read anything else?
Introduction	What is the policy issue and why it is particularly important?
Approaches and results	What did we learn about the current situation? / How policy recommendations have been created?
Implications	"If ..., then ..." (what could happen if something won't change)
Recommendations	What has to be done?

More information on policy recommendations can be found here: https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1590666588.pdf

3. Policy recommendations – West Midlands

3.1. Executive summary

The West Midlands region boasts strong industry partnerships, an innovative outlook, a supportive business climate, and a strong internationalisation approach. Coupled with successful case studies and building upon a strong legacy for industry, manufacturing, engineering and automotive, the West Midlands / Warwickshire (and wider Midlands region) continues to be a strong place to attract, incubate and cultivate innovation and transport related industry.

However, there is room for improvement linked to:

- A more sectorial focused approach or improved levels of expertise about transport sectors; linked to grow support towards Innovative Transport SMEs at local level;
- A better collaboration among Stakeholders involved in larger scale projects (for example for projects like the High-Speed Rail HS2 and the GigaFactory for EV battery production) at regional level;
- Maximisation of commercial opportunities and links between buyers and suppliers;
- Development of Financial Engineering Instruments to support SMEs and better Angel Investment links;
- Changes in market dynamics post-COVID;
- Internationalisation (especially in light of the UK EU Trade & Co-operation Agreement);
- Tackling Skills Gaps (particularly linked to innovation).

These are just some of the Region's current priorities. All of the aforementioned issues, however, have to be analysed in the context of a very challenging political and historical scenario incurred during the last few years, namely Brexit and the COVID-19 related crisis.

As explained in further detail below, a potential mis-alignment of support measures around the aforementioned main issues and opportunities would have serious implications for the Region's Transport Sector. It would affect its growth and longevity, most likely impacting jobs and potentially viability of businesses within the Sector.

3.2. Introduction

The West Midlands represents a centre of transport innovation in the UK, leading the smart, low-carbon movement of people and goods and connecting communities to new opportunities.

This includes not only the shift to electric and connected autonomous vehicles but also rapid technological change such as 5G, with the West Midlands being already the home to the UK's first 5G testbeds. Adapting to these challenges will create huge economic opportunities nationally and for the Region. The West Midlands will maximise these opportunities by combining advances in data science, artificial intelligence and sensing technology while completing large-scale infrastructure projects such as High-Speed Rail 2, the GigaFactory and improving the transport network. This involves a range of initiatives, all aiming at maximising the impact of current funding and putting the right foundations for future funding streams.

The next decade will be a period of large-scale change to how people and goods move, with significant innovation in mobility and continued changes to consumer preferences and global

committed. This funded a variety of business support programs. Many of those were delivered through the Innovation, SME Competitiveness and Low Carbon Priority Axes and have received very high levels of demand from SMEs across a range of industrial sectors (including SMEs servicing transport sectors). Those SMEs have been supported with issues linked to innovation and business growth.

COVID-19 resulted in the final ERDF Reserve Fund monies being channelled into temporary improvements to town and city centres to prepare for reopening after loosening of COVID restrictions, as well as small pots of vouchers to award small businesses to facilitate modernisation/diversification projects. As the economy recovers, this means that existing major ERDF schemes will need to adapt to service the evolving innovation and business growth needs of businesses across all sectors as England's main current source of funding to support businesses, not least those operating within and supplying transport sectors. In some cases, this will include helping businesses to respond to changing market trends within transport, such as electrification and advancement of low emission and connected & autonomous vehicles and in other cases will retail innovating to diversify and supply other sectors (this could not only include other modes of transport but also different sectors, such as health in response to global demand for ventilators). Coventry & Warwickshire-based programmes (e.g. CW Innovation Test Bed, CW Business Support, CW Green Business) will respond to this need, and will work closely with both other ERDF schemes such as WMG's Digital Innovation 4 Manufacturing and West Midlands Export Academy (DIT), emerging Government funded initiatives such as Made Smarter WM, and major transport schemes such as HS2 (supply chain opportunities – CWLEP Growth Hub now co-ordinating West Midlands response), Very Light Rail, Coventry Electric Bus City and Urban Airport Coventry. These projects have supported many local SMEs within transport sectors to innovate and grow and we expect further case studies demonstrating success to emerge.

As a result of the UK leaving the EU, UK Shared Prosperity Fund is planned to be the successor to EU Structural Funds after the end of activities delivered through the 2014-2020 programmes (the prospectus is expected to be published in Autumn 2021), but at the time of writing, the size, parameters, thematic areas of focus and governance mechanisms for the Fund is still to be defined. This will be a UK own fund to back the previous ERDF lines of funding.

3.3. Results

The Region's ecosystem is underpinned by a strong local policy focus on driving-up levels of innovation and maximising the potential of our key assets, including our major research-intensive universities, RTOs and R&D active firms.

Given the Region's historical success in securing and successfully deploying ERDF and ESF funds (Coventry & Warwickshire successfully allocated the majority of its EUR136m allocation of ERDF and ESF for the 2014-2020 Programming Period), a Shared Prosperity Fund that is designed in a manner that enables Coventry's businesses to prosper is vital.

The ability to support SMEs operating within the transport sector will be paramount. Through the 2014-2020 ERDF programming period, Coventry has developed successful SME support schemes, delivered in partnership with other crucial local business support bodies such as the Chamber of Commerce, Growth Hub and local universities, and it is important that beyond June 2023 (end of ERDF), UKSPF enables us to continue to build on these successes and partnerships

(and how we have been able to support successful development and transformation of some businesses) and apply lessons to make necessary improvements to ensure UKSPF can fund programmes respond to local economic needs and opportunities.

Ideally, the aim would be to build capacity in order to back the Transport Sector by promoting and encouraging both innovation and growth.

More in general, **linking Suppliers to opportunities** in the Transport sector has been a key issue in the West Midlands area. The issue could be segmented into two tiers: Regional – for projects like HS2 – and at Council level for more local opportunities.

The opportunities linked to NUTS 1 region and the local ones, require respectively **two different levels of engagements: Regional and Local** (interventions that are very niche in terms of sub-sector/supply chains targeted or types of innovations will probably need a wider regional response).

Coventry & Warwickshire Growth Hub (CWGH) will coordinate the whole West Midlands regional response to HS2 (High Speed 2 is a high-speed railway system, with its 176-kilometre first phase under construction and future stages awaiting approval) around supply opportunities. This will be done for example by using online platforms like “Find it in CW” (a procurement/supply chain opportunities platform led by CWGH and covering all sectors, which brings supply opportunities to transport SMEs, connecting demand to supply and bridging the gap between tier 1 and 2/3 suppliers). Coventry & Warwickshire Growth Hub will also coordinate the £1.9M funding for the MADE SMARTER Program. This is a program designed to push digital innovation among manufacturers. Due to the nature of the West Midlands Region, most of our manufacturers are Transport related companies.

The key to the future of the development post Brexit and post COVID of our area relies upon:

- A better collaboration and **collaborative working across Regional Organisations** – for opportunities of regional remit, like HS2 (better clustering work at Regional Level among players like the WMCA, Transport for West Midlands, the Aerospace alliance, the Rail alliance and more) linking in with Growth Hubs, Local Authorities and DIT and working alongside local-level business support programmes.
- A minimum level of **funding** – in terms of money and time – similar to the current level of activities and support. Short term funding in Business support organisations remains a main issue at the moment, especially when the business 1-2-1 support model offered is based on advice based on an Account Management model. This means that companies are supposed to be supported by one main business adviser along their business journey. Much business innovation is a long-term process and takes longer durations of support to realise outcomes. Post Covid and Brexit, long term funding commitments are in need. Considering the ERDF and European Social Funds will end June 2023 (post Brexit), new lines of funding are required from a National Level to sustain the same or similar level of activities, aimed at fast forwarding growth for Businesses in the Transport Sector. Considering the current ERDF / ESF funding runs in 7 years cycles and have a 3-year funding streams, a similar long-term commitment would be required to sustain a similar line of support. In order to improve further the system and attract the right level of staff and add value to businesses in the mid-long term, longer funding cycles would be

preferred to shorter lived ones. UK Shared Prosperity Fund (new national fund that is the planned successor to EU Structural Funds) will/should continue seamlessly.

- **Sector Focus – Regional** stakeholders working together to coordinate transport sector as a response to regional needs. Maximising the level of collaboration between Regional authorities and Local ones like universities, DIT and other important business support organisations is key, together with a better alignment of interests of the different parties and players involved in the sector.
- **Sector Focus – Locally.** Transport Sector specific expertise at Local level is also instrumental to growth from a SME perspective. For businesses in this sector, being supported by specialist advisers with an understanding of the sector and changing market dynamics is key to growth.

There is an opportunity in the region from partnership working. For example, the universities, LEPs and Local Authorities alongside the West Midlands Combined Authority, for access to resources, devolution funding, and innovation projects such as Very Light Rail (VLR) and Smart Parking. The region has built a reputation for being a leader in the field of intelligent mobility and has an ecosystem of physical and digital assets, now forming a ‘testbed’ for further inward investment and scalable solutions. Providing SMEs, manufacturers and researchers with a live environment with various aspects of urban, inter – urban, and rural conditions to develop sustainable evolving products. These projects are backed by government and align with the regional and national strategies. SME involvement in projects range from expertise in modelling, parking, developing bids, developing vehicles, technology, safety features, understanding regulations, simulation, cyber security, and communications. As a result, they may have increased their headcount, improved supply chains, or diversified to new sectors, applications and international markets (e.g., Appy Parking, RDM / Aurrigo, InfoHub). By building on these successes with continued and improved innovation support, there are opportunities to realise other innovation and growth success stories within transport SMEs.

3.4. Methodology

These recommendations are prepared in the framework of Interreg Europe project “RECREATE”, the goal of which is to reinforce the competitiveness of regional transport SMEs. The preparation of recommendations document follows the methodology, which was created by the Lithuanian Innovation Centre in consultation with other project partners (Coventry University Enterprises Ltd., Development Agency of South Aegean Region, Regional Development Agency South-West Oltenia).

In order to prepare these recommendations, Stakeholders’ meetings took place, together with the analysis of national and regional news with the aim to understand policy goals and actions in regards to our Regional latest priorities in the transport sector. In addition, desk research was also implemented, with the analysis of various reports. This provided an opportunity to make recommendations, which are based on latest economic and political development findings as well as good practices from other regions.

3.5. Potential implications

A lack of support measures around the aforementioned main issues and opportunities would have serious implications for the Region's Transport Sector, its growth and longevity. It would most likely impact growth and the competitiveness and potentially viability of businesses within the transport Sector and therefore impact jobs and the future of our economy.

Businesses are very confused at the moment due to Brexit and Covid-19, with many needing to innovate in some form to at minimum remain competitive. A sectorial, more streamlined, clear and focused approach to business support activities and initiatives could only impact such businesses in a positive way. Most of the SMEs in Transport do struggle to navigate in a very mature, but also very complex business support scenario (at regional, local and international levels).

The key here is to support and potentially expand overarching organisations, like the Growth Hubs, in order to guide businesses across the complexity of the current business scenario.

Key to the future is, however, developing a more sectorial focus to business support structures. Sectorial focus within transport will lead to:

- Better links with Tier 1 companies (inclusive of opportunities for local SMEs in the sector to collaborate on new innovations to strengthen supply chains);
- Better links to International Transport related opportunities.

A Long-Term future funding cycle and funding structures, at minimum reflecting the current levels of EU Structural Funding (ERDF-ESF), will lead to a more systematic, consistent and valuable support to businesses, adding value to the SME and the local economy in a more substantial way.

3.6. Policy recommendations

Following on previous considerations, these are proposed policy recommendations:

1. Importance of a more Sectorial approach at Regional and Local Level

- **Sector Focus – Regional** stakeholders working together to coordinate transport sector to respond at Regional level. At national level, there has been an increase of Regional activities and Innovation programs. However, High level Innovation and regional transport projects like the HS2 – High Speed Train-and the proposed new GigaFactory - building batteries for electric cars- (both linked to transport innovation) require a Regional coordination and working, beyond the urban remits and beyond single organisations' interests. Maximising the level of collaboration between Regional authorities (organisations like the West Midlands Combined Authority or Transport for West Midlands) and Local ones (like the Growth Hub, Universities, Local Authorities, the Chamber of Commerce, all Local SME support programs aimed to grow innovation in transport) is key. Together with a better alignment of interests, this would result in increased efficiencies and outputs.
- **Sector Focus – Locally.** Transport Sector specific expertise at Local level is also instrumental to growth from a SME perspective. For businesses in this sector, being supported by specialist advisers is key to growth. A Sectorial approach would also translate in a faster and more focused approach to specific opportunities, links to targets clients (increased links between

tier1-2 suppliers), an improved International foothold and overall a more resilient, profitable business. At Local and Sub-regional levels, this could be translated in organisations like Growth Hub and in major local innovation support programmes like the CW Innovation Test Bed. This programme has historically supported high numbers of transport SMEs and is likely to continue to do so.

2. Importance of strengthening Cluster Activities

Regional level bodies have an important role to play. A better collaboration of Cluster sector bodies is paramount to the support of Innovation, both at macro and micro levels.

Collaboration:

- Between Cluster bodies (like the Midlands Rail Alliance or the Midlands Aerospace Alliance or similar). This could stimulate more cross-sector innovation;
- Between Cluster bodies and local organisations and institutions (like Universities, relevant Local Authorities, Growth Hubs, etc.);
- Between Cluster bodies and local businesses (working in partnership to create better opportunities for the sector, lobbying with Governments, regulating Innovation linked to Transport and, more in general, building a community voice) is paramount to be able to effectively support businesses in the Transport Sector to innovate.

3. Intellectual Property

A more cohesive approach to IP audits and certifications linked to innovation is needed. Better collaborative work among Regional and Local players would result in less barriers to market for innovative businesses (with high IP requirements) and a reduction of risks. More SMEs in particular would access support with IP processes and certifications for new products.

4. Better Links between Tier1 and Tier 2/supply chain (buyer/supplier)

Web platforms like the “Find it in CW” (local transport related business opportunities) or great.gov.uk (international business opportunities) represent a digital tool to link buyers and suppliers around a specific business opportunity (either locally or internationally). Increased awareness (e.g., through marketing) and usage of those, would be an answer to one of the main issues of the Transport sector: missing links between tier 1 and tier 2/supply chain. It could also facilitate businesses to work with each other on new innovations that could also service Tier 1 firms.

5. Financial Engineering Instruments to support SMEs – better Angel Investment links

Regional bodies should be more responsible. Longstanding problem in the West Midlands is the supply of equity. Proof of concept is not enough. The WMCA has identified a need for at least £20M of further equity and proof of concept funding that could be further exploited in the future and would benefit Transport sectors.

6. International focus

The West Midlands has long been renowned as a centre for industry and manufacturing. Despite the challenges of globalisation, manufacturing remains the largest industry in the region, with strengths in basic metals, metal products and transport equipment. External challenges around Brexit, COVID and the global economy mean the West Midlands must be clear about their offer and what makes this a great place to invest.

The Department for International Trade (DIT) is currently evolving as an organisation. At the moment, it offers 3 levels of support/expertise: at National, Regional and Local levels. DIT also developed an online platform with the aim to bring Sector Export opportunities in foreign markets (Export Opportunities on the [great.gov.uk](https://www.great.gov.uk) website) with the aim to link international buyers/ UK based sellers.

Lately, as a result of the UK EU Trade & Co-operation Agreement and other changing global market dynamics, DIT has also developed a new initiative named The Export Academy.

Its aim is to give small and micro-businesses the know-how to sell to customers around the world with confidence. It's applicable to a wide range of businesses, inclusive Transport related ones. Whether a business would want to start exporting, or indeed aiming to enter new markets, DIT will support to overcome many of the common challenges that small businesses can face. The programme is designed for owners and senior managers of businesses looking to grow internationally and located in the Region, but also stretches across the rest of the country. The Export Academy features educational events, independent learning, networking and group mentoring, together with support by local international trade advisers, and the chance to join future trade missions and access grants and funding.

7. Skills Gap

Whatever skill support there is locally, there is a need for it to be well aligned with the innovation support offering. A barrier to innovation is skills: you can have all of the scientific expertise and the innovative equipment you want, but if there are no people with the right skills able to operate such machines this represents a barrier to growth.

It is important that, alongside innovation support to our SMEs, the skill support is also there. The West Midlands area faces multiple skills challenges. Better collaboration between Education providers and Innovative Transport SMEs is required, and also improved alignment between capital innovation infrastructure schemes, innovation support programmes targeted at SMEs in particular, and education and skills support programmes in order to align offer and demand of specialised and advanced skills.

4. Policy recommendations – South Aegean region

4.1. Executive summary

Sustainability and resilience in the transport sector of the South Aegean Region should be a key objective in the Region's policy documents. As the transport sector is vital for the sustainability and resilience of the Region and as the transport SME's need to adapt to the global economic trends and challenges, they need to invest in innovation in order to develop quality services and to create an integrated transport network which will serve both residents and visitors/tourists needs.

Regional policy documents promote innovation having highlighted the benefits of integrating digital, smart technologies, as well as smart pricing and financing measures for the islands. Strengthening of the decision-making and management structure of the smart specialisation strategy, investing on research and innovation and on the development of a cluster "culture" are key success factors to create an integrated and sustainable transport sector. Very vital, towards this direction, is the development of incentives for new IT-enhanced products and services from local transport SMEs with the support and guidance of the Region's academic and research institutions.

As policy-making is the first step which will direct funds onto specific actions, policy-makers need to be fully aware of the transport sectors state-of-the-art, opportunities and challenges, as well as its importance to the overall regional economy. Regional policies need to fully integrate with the EU policies and programmes on SMEs support, the EU Coastal and Marine Policy, EU tourism policies and support to tourism businesses and EU Transport Policy Framework.

4.2. Introduction



The Gross domestic product (GDP) of the region was 6.4 billion € in 2019, accounting for 3.5% of Greek economic output. In 2018, the transport sector in PNAI numbered 2,201 SMEs with a total turnover of 208.5 million euros (2.8% of the region). The transport sector directly employs 4,398 people. At the same time, the transport sector – including warehousing and support activities for transportation, travel agency, tour operator and other reservation service and related activities – is considered a technology and knowledge intensive sector with great opportunities, employing in 2019 – directly and indirectly – 9,000 people, which represent the 4.8% of the Region's employment.

Island regions are highly dependent of the efficiency and sustainability of the Transport Sector, as different transportation means and services are required in order to address the local economy needs and challenges. Policy and decision-makers have the key role to identify the challenges and opportunities for the Regions, to integrate EU policies into the regional and local strategies

and to suggest measures and improvements based on the results and achievements of policies implementation.

Greece has the longest coastline on the Mediterranean Basin and the 11th longest coastline in the world at 13,676 km, featuring many islands. Four (4) out of the 13 administrative regions of the country are entirely composed of islands, covering a total area of 19,805 km² (15% of the country's total area). The South Aegean Region (PNAI) covers an area of 5,305 km² representing the 27% of the country's island area (EUROSTAT). However, the transport section in PNAI struggles, as seasonality and high volumes of visitors during the summer season, make it difficult and challenging for the regional and local administration to create and deliver an integrated plan for sustainability and resilience in the transport sector. In PNAI, there are almost 800 motor vehicles per 1,000 people. In addition, in the summer season, the Region receives 27% of the total maritime passengers of Greece, as well as 22% of the air passengers. Almost 2,800 thousand tonnes of freight are transferred from and to the islands by sea (1.8% of the national freight transport), as well as 2 thousand tonnes by air (1.9% of the national freight transport).

European and national funding sources usually support innovation horizontally in all economic sectors. The South Aegean Region Smart Specialisation Strategy (PNAI RIS3) is the main policy document supporting innovation and research in four (4) main economic activities: a. Fishing & fish farming, b. Tourism & Hospitality (inc. retail sale of goods and food, activities of travel agencies and tour operators; tourist assistance activities), c. Agriculture, Livestock farming & Agri-food, d. Renewable energy sources. The main funding source is the South Aegean Regional Operational Plan, managed by the South Aegean Region. Other sources are the European Agricultural Fund for Rural Development and the National Operational Programme «Competitiveness and Entrepreneurship». 54.3 million euros were allocated for innovation, R&D and ICTs within the programming period 2014-2020. The annual gross domestic expenditure on R&D in the PNAI was about 11 million euros (in years 2015, 2017 and 2018). However, only 500,000 euros represent the business-enterprise sector, thus the SMEs.

Apart from the Regional administration, there are several research and academic institutions, which support R&D and innovation, receiving EU and national funding. The organisations mostly contributing to the sector are the University of the Aegean through the Department of Product Design Engineering and Systems of the Polytechnic School (<https://www.syros.aegean.gr/en/department/getting-acquainted-department>), the Hellenic Institute of Transport (Rhodes Department) and the Hellenic Centre for Marine Research (<https://www.hcmr.gr/en/>).

Regarding transport SMEs, they seem not to utilise existing support measures and sometimes they are not even aware of the funding opportunities. Lack of access in information for funding sources and opportunities, of sectorial collaborative bodies and places to foster innovation and R&D (clusters), are some of the reasons leading the transport SMEs to lack competitiveness and innovation. In addition, there is little support to graduates and young professionals of relevant fields to invest in the region, to create new businesses and to innovate, as the link between research and academic institutions and the market is very weak. As a result, transport SMEs are mostly linked to the tourism sector and follow its trends and needs, being strongly dependent to this sector. As transport SMEs act individually, they do not have the opportunity to exchange experiences, transfer knowledge and create and promote innovation in a Region like the South Aegean, which has unique features and could foster R&D activities in maritime transportation,

intermodality with other transport means (air and land), accessibility in island regions and low-carbon transportation.

4.3. Results

The challenges that the transport sector in PNAI faces reflect directly the region's sustainable development challenges that are also similar to other European island regions and overseas island countries. The transport sector, which is almost completely consisting of SMEs, has to deal with limited resources, remoteness, susceptibility to natural disasters, excessive dependence on international trade and tourism. So far, the transport sector's sustainability and resilience are



threatened by the restrictions that the sector faces due to high communication, energy and transportation costs, irregular international transport volumes, disproportionately expensive public administration and lack of infrastructure.

Lack of innovation is a major issue in the PNAI's transport sector, as the sustainability and resilience of the sector are highly dependent of it. The transport sector in PNAI plays crucial role in economy, as it supports freight and passenger travel, the activities of the tourism sector and the physical link among the islands and with the inland. Innovation offers better links, networking, development of ICT tools, facilitates logistics, tourist flows, freight transfer, creates new collaborative schemes and promotes research and sustainable development. SMEs, especially in the South Aegean Region, which consists of several islands, are those which could bring forward innovation in the Region through their knowledge about the islands' unique challenges and opportunities. However, lack of integrated activities and of a body or governance scheme that could coordinate the transport SMEs activities, currently rein back innovation and creativity. In this direction, associations, clusters and networks could act as driving forces in promoting innovation and creativity; this is something that the Region currently lacks of.

The transport sector struggles in the high-tourism season, where the problems become more evident due to the high demand of transport services. Digitisation, smart systems and applications make it possible to increase sector's innovativeness and contribute the its technological renewal. Public administrative bodies need to address the lack of investments in innovation and research. Policy makers have to use all possible funding sources to strengthen transport SMEs and to promote research around innovative solutions. The regional policy documents – including the smart specialisation strategy – need to recognise the significance and importance of promoting innovation in the transport sector horizontally, considering the Region's insular nature, which forces SMEs to be more adaptive, creative and innovative. Accessibility and intermodality, together with low-carbon transport solutions need to be investigated. Local research and academic institutions – in close collaboration with the transport SMEs and commercial associations, the regional and local authorities and stakeholders within tourism and trade sectors – need to develop specific research and innovation around these topics.

4.4. Methodology

These recommendations have been prepared within the framework of Interreg Europe project “RECREATE”, the goal of which is to reinforce the competitiveness of regional transport SMEs. The preparation of recommendations document follows the methodology, which was created by the Lithuanian Innovation Centre in consultation with other project partners (Coventry University Enterprises Ltd., Development Agency of South Aegean Region, Regional Development Agency South-West Oltenia). In order to prepare these recommendations, regional policy documents were analysed, such as the Regional Operational Programme of the Region of South Aegean, the South Aegean Smart Specialisation Strategy, the Regional Spatial Planning & Sustainable Development Framework for the Region of South Aegean, with the aim to understand policy goals and actions with regard to innovation, research and SMEs competitiveness in the transport sector. In addition, various quantitative data and indexes were also analysed from both, national and EU level data sources in order to present the state-of-the-art of the transport sector in South Aegean.

4.5. Potential implications



Transport is a key driver of economic growth in the South Aegean Region. It is a dynamic sector with many fluctuations in the travel characteristics (i.e. time, frequency, comfort etc) throughout the year, as there is a dramatic increase in daily trips and travel demand during the summer, which is the high-tourism season.

Innovation and smart technologies in the transport sector could greatly contribute and promote social cohesion (economic growth, employment), sustainable and smart tourism development (transport costs, time) and environmental preservation through smart and low-carbon transportation. Lack of investment in innovation and smart technologies through the improvement of regional policy documents and the engagement of stakeholders of the transport sector, will lead to a gradual degradation of the local transport SMEs, thus of the local economy which is mainly based on tourism, and thus will have a negative impact to employability in all sectors.

With a percentage of 30,6% of the PNAI's total population to be at risk of poverty or social exclusion, it is evident how crucial is to invest in the improvement of the transport sector and where to focus innovation on. Minimisation of disruption, safety, improvement of logistics, increased quality of transport products and services, reduced CO₂ emissions, are expected results that would not be achieved when there is lack of an integrated plan for transport development which focuses in innovation and smart technologies.

Innovation requires also good coordination, which is the first step towards a consolidated planning with the involvement of several stakeholders of the transport, tourism and trade sectors. If policies would not focus on innovation, transport SME's, which are the main actors of the sector in South Aegean, will lack competitiveness and will not be able to increase their capacity in skills to adapt to the worldwide economic trends and international markets.

Last, the maritime transportation (only passengers' ships) in South Aegean Region contributes by 36,4% to the GDP of Greece's insular area, bringing the region to a second place after the

Region of Crete (41,3%). It becomes evident that tourism is highly dependent on the transport sector. Lack in innovation in the transport sector will also lead to a collapse of the tourism sector, negatively affecting more than 55% of the Region's employment.

In summary, the transport's sector sustainability is linked directly to the Region's sustainable development. Focused and integrated policies are necessary to achieve economic growth and social cohesion, promoting at the same time respect for the environment.

4.6. Policy recommendations

In 2019, the National Transport Plan for Greece was developed, as a part of the EU's 2011 White Paper "Roadmap to a Single European Transport Area". The Plan was funded by the European Union and implemented by European Investment Bank (EIB) in cooperation with the European Commission's Structural Reform Support Service (SRSS). The purpose of this strategic document was to summarise the national strategy that will be pursued over the next 20 years, as well as to propose interventions with varying levels of maturity, some of which are at a generic/conceptual level. Based on this Plan, and the seasonality and high volumes of visitors during summer season, a transport sector development strategy should be prepared, by focusing on the needs of the Region of South Aegean.

The specialisation of the transport SMEs appears to be limited, thus policy makers should focus on technology upgrading, low-carbon transport systems, ICT services, smart services for tourism, transport means accessibility, accessibility by sea, etc. The region is in need to explore the possibility of creating a single business support and innovation cluster with a view to providing a holistic support to transport SMEs (informing them about funding opportunities, networking, design and implementation of investment and business plans, synergies with academic and research institutions etc).

1. Recommendations on governance

There is lack of a decision-making and management structure of smart specialisation strategy which leads to limited opportunities for funding, collaboration, synergies, knowledge transfer and business support. Regional Government and stakeholders consider tourism as core sector of South Aegean and all other sectors, including transport, depending and existing through tourism. The formation of a thematic working group consisting of transport sector's stakeholders could connect the sector to tourism technologies of (1) ICT and digital media, (2) creative services for marketing and promotion, (3) green energy, and (4) smart government.

2. Recommendations on innovation policy

Very little has been achieved in the transport sectors regarding SMEs support for research and innovation even though there are policy instruments supporting horizontally those thematics. It is important to create collaborative schemes like public-private partnerships in order to leverage private funding and generate sustainability. Towards this direction, strategic planning demands also the recognition of areas in which interventions have high multiplier effects and linkages enabling the impact to spread out in more sectors.

Transport for tourism is the starting point for discovering and creating technologies that can diversify the offered products and services in the South Aegean Region. Technologies to focus on include: (1) ICT and digital media, (2) creative services for marketing and promotion, (3) green energy, and (4) smart city technologies. Reduction on transport costs and travel time savings for short distances and commuting, should become the main subject in policy documents, focusing

on the utilisation of new eco-friendly, innovative and creative initiatives for the transport sector. The aim is to facilitate residents and tourists' trips, to creation new, long-term jobs through skill building on innovation, creativity and smart technologies, and to stimulate entrepreneurship and business culture.

Lastly, the environmental advantages of moving towards smart tourism/destinations should not be neglected. Investing in low-carbon transportation would improve commuter traffic safety, people could access more work and social possibilities because to more economical, efficient, and safe transportation. Because of the evident linkages between greenhouse gas emissions, low-carbon transportation is becoming a more viable local investment, both in terms of decreasing emissions and thereby mitigating climate change, as well as benefiting public health through improved air quality.

3. Recommendations on clusters and entrepreneurship

The contribution of the transport sector's stakeholders to the regional sustainability and resilience is crucial and could be achieved to a large extent through the development of synergies and clusters. The South Aegean Region lacks previous experience in cluster policies (there was no "cluster culture") and there are no mature clusters operating in the region. Cluster policies could enhance the technology domains related to transport. A competitive transport cluster approach could facilitate the rapid spread of good practices. In terms of business support, clusters can also operate as one-stop-shop by merging existing structures to support SMEs in designing and implementing business plans with an export orientated focus. In addition, the establishment of an incubator, hosting new and smart transport technology firms could be complementary to the region's most competitive sectors, such as tourism and fishery. Finally, it is recommended to support the creation of a business angel network and co-investment fund to ensure a large enough deal flow.

4. Recommendations on ICT policy – broadband – e-services

The region should strengthen support on ICT in the transport sector, supporting in parallel other sectors as tourism and fishery. The region should investigate viable policy tools to provide incentives for new IT-enhanced products and services from local transport SMEs, and also award funds for the fast transformation of traditional businesses using ICT tools. Smart transportation and wireline/wireless broadband expansion are crucial for the competitiveness of the whole sector. The hidden growth potential of remote areas and isolated islands, within the Region, should attract special attention, since it can be exploited using affordable ICT technologies. Better conditions would enable the private sector to have a more substantial role in assuming part of the risk of the planned ICT investments.

5. Policy recommendations – Lithuania

5.1. Executive summary

An economy based on the principles of circularity will be our future. Lithuania as an integral part of the European Union (EU) is committed to reducing its negative impact on the environment and the transition from a linear to a circular economy (CE) will be one of the main instruments. Currently, the CE in Lithuania is underdeveloped – f. e. the amount of industrial and municipal waste is growing, while at the same time the circular material use rate in the context of EU is quite low. In order to improve this situation and to enable the transition to be smooth and successful, change will need to happen not only in the individual parts of the value chain, but also in the supply chains, which will need to become more sustainable and resource-efficient. As a result, transport and logistics will play a crucial role in this process. By their nature, these sectors are horizontal and cover a wide range of activities, ranging from resource allocation, storage and transportation of manufactured goods, collection of waste, distribution of secondary raw materials, and so on. However, despite the clear contributions it can make to enabling the circular economy, policy documents and business activities do not reflect this. Various strategies and support instruments leave transport and logistics outside the CE and mostly focus on the micro level (manufacturing sector, waste management, eco-innovations) while various indicators show that transport and logistics sectors themselves apply too little technologies related to CE. This situation has negative implications for the future of Lithuania, as it might struggle to achieve ambitious climate-related goals, while at the same time businesses from various sectors will face challenges related to growth and competitiveness. In view of all this, sustainable growth in Lithuania will be achieved if policy makers and businesses themselves will take some actions as soon as possible to make transport and logistics more CE friendly. This will require a variety of actions, including the development and implementation of various innovations, technologies and business models, adequate human capital and regulations, systemic thinking and the change in the transport sector itself.

5.2. Transport sector in the context of circular economy

Lithuania can be considered one of the leaders in transport and logistics throughout Europe. Due to its geographical position, it has become one of the most important transport centres in Europe, linking the EU with the East, the North with the South. In 2019, Transport and logistics accounted for around 13,8 % of national GDP according to Eurostat, making it third biggest economic sector in Lithuania after the Manufacturing and the Wholesale and Retail. Also, currently this sector has around 8 700 private sector companies (99,3 % are SMEs / 77,9 % has from 1 to 9 employees), which employ around 142 000 employees.

Transport and logistics activities are highly interconnected with other economic sectors. In various value chains transport and logistics play an important role, as it facilitates local and global trade (transportation, distribution and storage of various goods). Taking this into account, changes, for example in manufacturing, construction or other economic sectors also highly influence the way transport and logistics work, the principles, methods or technologies it uses. On the other hand, the same could be said to the transport sector as new innovation and management tools applied in this sector also influence other economic activities. This reciprocal effect means that transport, like other economic sectors, cannot be static and constantly changes. In this context, new economic trends, that are or will be applied to various economic sectors, including digitisation and CE will inevitably change the way the transport sector operates.

Today's linear economic activity model is under the increasing pressure to change. To put it simply, in a linear economy we mine raw materials that we process into a product that we later throw away after we use it. This pattern of economic activity poses certain challenges. Together with the rise of the global population and consumption, global demand for raw materials is growing, while their availability is declining. Also, some of the raw materials are imported from other countries, making them more dependable on each other's. Last but not least, production and use of raw materials has a significant impact on the environment by increasing the use of energy consumption and CO₂ emission. As a result, a new circular economy approach had emerged with the help of academics, politicians, businesses and international organisations. A circular economy aims to maintain the value of products, materials and resources for as long as possible by returning them into the product cycle at the end of their use, while minimising the generation of waste. In order to understand this principle, the approach of 9-Rs is often used. According to it, the CE can be achieved by following these principles: 1) Refuse: preventing the use of raw materials; 2) Reduce: reducing the use of raw materials; 3) Reuse: product reuse; 4) Repair: maintenance and repair; 5) Refurbish: refurbishing a product; 6) Remanufacture: creating new products from (parts of) old products; 7) Repurpose: product reuse for a different purpose; 8) Recycle: processing and reuse of materials; 9) Recover energy: incineration of residual flows. Therefore, in a circular economy, material cycles are closed in the ecosystem, and there is not such a thing as waste, because every residual stream can be used to make a new product. Also, just like raw materials, energy also has to last as long as possible in the circular economy. Lastly, it is important to ensure the systemic thinking, where every player in the economy (producers, distributors, consumers, etc.) would be connected to each other.

Within this new economy, the principle of backwards appears near the principle of forward and in this context, transport sector and logistics becomes even more important. In a traditional linear economic model, raw materials or goods produced mostly move forward. As a result, the role of transport and logistics in a traditional or forward logistics systems deal with the flow of products from raw materials to the manufacturers, to the retailers, and finally to the consumers. At this last stage, the role of transport and logistics is mostly finished. On the other hand, with the transition to the circular economy, the scope of transport and logistics activities expand significantly. When we focus on the reverse flows, we consider the movement of goods in reverse to the point of origin. It starts at the end-user and finds its way back to the retailer or manufacturer for proper disposal or to remanufacture or refurbish a defective product, and even as far back as raw materials via recycling. Taking this into account, in order to fully achieve the circular economy, it is important to understand the impact of transport and logistics and create favourable conditions, so it can enable and empower circular economy to its full potential.

i. The promotion of the circular economy in Lithuania

Policy attention to promote CE is gaining more attention at both EU and national level. Regarding the national governance structure of CE policy, the Ministry of Environment is the main institutions in Lithuania, which implements waste management policy and circular economy is one of the top priorities under it. Creation and implementation of various innovations are also critical for the successful transition towards the circular economy, and the Ministry of Economy and Innovation is responsible for implementing policies in this area.

At the strategic policy level, European Green Deal is a major strategy devoted to transform European economies and make them climate neutral and circular. Transport sector is seen as an important element in this strategy, as it accounts for a quarter of the EU's greenhouse gas

emissions and this figure continues to rise as demand grows. As a result, there is a goal to reduce these emissions by 90% until 2050, while the main policy targets will be: clean vehicles and alternative fuels, shift towards rail and inland waterways, multimodal transport, transport digitisation. Another highly important strategy in the context of EU Green Deal is the Circular economy action plan. Strategy identifies priority sectors, including batteries and vehicles, packaging, plastics, textiles, food, construction and building. According to the action plan, these sectors and their related value chains will gain most attention in order to transform them into a more environmental-friendly ones. In the Lithuanian context, the priority to foster circular economy is described by the objective 1.4 of the Lithuanian National Progress Plan for 2021 – 2030, that is to “Reorient industry towards a circular economy and promote the development, deployment and diffusion of advanced technologies and innovations” Under this priority, targets related to the GHG and other emissions, innovation activities, ecological indexes are set. In addition, Lithuanian Programme for the EU funds’ investments in 2021–2027 also emphasises the importance of circular transition. Under the task 2.6 “To promote the transition to a circular economy and a resource-efficient economy” under the second priority “A greener Europe”, Lithuania aims to achieve the economy which would be circular, to reduce the amount of waste that would be disposed of in landfills, to recycle as much waste as possible, to encourage science and business cooperation, raise public awareness on waste prevention and management. Last but not least, circular economy is also singled out as a priority in the Lithuanian National Energy and Climate Action Plan. Transport sector also plays an important role in this strategy and the goals here are to reduce the GHG emission, increase the use of the alternative fuels, renewable energy and so on.

Regarding the practical promotion of the circular economy in Lithuania, certain support needs to be created. First of all, as the development and implementation of innovations are key to the successful transition to circular economy, current Lithuanian Smart Specialization Strategy (S3) provides a quite good basis for it. This strategy defines Lithuania’s R&D&I investment priorities and topics, including New production processes, materials and technologies, Energy and sustainable development, that are very important in this context. Various innovation related actors were able to apply for the support schemes under the first priority of the Lithuanian Operational Programme (OP) 2014 – 2020 if are in line with the S3 priorities in order to create new innovative solutions, that could be important for the circular economy. In addition, under the third priority of the Lithuanian OP (Promoting the competitiveness of SMEs), there were two important support instruments “Eco-innovations LT” and “Eco-innovations LT+” dedicated to foster eco-innovations in Lithuania. Both support instruments are dedicated to the SMEs, yet the first one supports the implementation of non-technological innovations (the implementation of environmental management and control systems as well as eco-design and eco-labelling), whereas the second one is dedicated to promote the implementation of technological innovations (modernisation and optimisation of processes with the aim to reduce the negative impact of the environment and / or conserving natural resources, waste production, waste reuse, recycling, heat recovery, flows separation, etc.). In the context of the circular economy, the second investment priority of the fifth thematic priority “Investment in the waste sector to meet the requirements of the EU environmental acquis and to meet needs identified by Member States in excess of those requirements” is also highly relevant. This priority pursues objectives, such as the decreased share of municipal waste disposed of in landfills (from 78 % in 2011 to 30 % in 2023) or the increased proportion of paper, plastic, metal, glass waste in municipal waste stream ready for re-use or recycling (from 17 % in 2010 to 50 % in 2030). In order to reach these objectives, some policy measures were created. One of them is “Development of municipal waste management

infrastructure” under which municipal administrations or regional waste management centres can get funding for activities such as the establishment / renewal of infrastructure, which would enable the preparation of waste to be re-used, or the installation or renovation of bulky waste collection sites and / or their adaptation so the waste could be prepared to be re-used.

ii. Effects of the current situation

Even though circular economy is quite high on the policy agenda and there are some support instruments dedicated to foster it, Lithuanian transport and logistics sector is decoupled from it and it is not seen as the one, that not only could, but also should contribute to the circular transformation. First of all, transition to CE in Lithuania is mostly seen through the development of innovations, digitisation, industry transformation and other actions, yet there is a lack of vision to the whole value chain. The focus is mostly concentrated on the micro level and particular sectors, that is, for example, on the industrial companies that have to foster in-house circular transformation or the constructions sector, that has to improve its business models. On the other hand, little attention is paid to the transport and logistics sector, which can bring together various actors from the micro level – this is the result of not seeing the full picture (macro level). By its very nature the transport sector is horizontal, which means that it brings together different players in the value chain and in order to implement the principles of circular economy, there is a need to be efficient in the whole value chain. In addition, even in the case of micro level, transport is not perceived as a priority in the circular transition. Some of the policy goals regarding transport sector are related to sustainability, that is the reduction of GHG emissions, transport electrification and so on, however there is a lack of attention to the principles of the circular economy, which could be applied to the transport sector, that would enable value chains to become more circular (sustainable over circular). It is important to understand, that sustainability and circular economy have two different meanings, even though these terms are very often used together and somewhat interchangeably (sustainability is a broad concept related to the integration of economic performance, social inclusiveness, and environmental resilience, to the benefit of current and future generations, while the circular economy is a system, in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops).

5.3. Current situation of circular economy and transport sector

Even though the development of circular economy is one of the top priorities in Lithuania, its development is quite fragmented and the results are quite ambiguous. First of all, to understand the use of materials in the economy, it is important to measure the level of domestic material consumption. Between 2009 and 2019, domestic material consumption in Lithuania increased from 34,9 up to 52,97 thousand tonnes (by 52 %). Also, the indicator of the direct material input saw a significant increase in ten years – from 54,2 thousand tonnes in 2009 to 84,4 thousand tonnes in 2019 (by 56 %). Within the growing volumes of the production in the economy of Lithuania, there was also a natural increase in the use of various materials. Yet, according to the productivity of resources (ratios of GDP over domestic material consumption in various unit of measure / it reflects the GDP generated per unit of resources used by the economy), Lithuania was only in the 22nd place among EU27 in 2019 with the result of 0.9 euro per kilogram. Between 2009 and 2019, productivity of resources in Lithuania increased by around 20 %, while the increase in EU27 during the same period was around 36 %.

In this context, it is also important to understand various indicators related to the waste. First of all, according to The Environmental Protection Agency, the volume of generated industrial waste is growing – 2213 thousand tonnes of waste in 2013 compared to 3360 thousand tonnes in 2018 (the amount of generated industrial waste increased by an average of 5% annually). Also, it is important to note, that the amount of municipal waste in Lithuania is growing, while at the same time population is declining. It means that the amount of accumulated waste per capita is increasing and in 2018 this number was 464 kilograms. Despite the growing amount of waste, since 2015 Lithuania made a significant improvement regarding the amount of recycled municipal waste. Recycled municipal waste compared to municipal waste generated in 2015 accounted for around 33.08 %, but since then this number is around 50 %, with 49.45 % in 2019. Despite this positive tendency, the circular material use rate (it measures the share of materials recovered and fed back into economy – thus saving extraction of primary raw materials – in overall material use / ratio is defined as the ratio of the circular use of materials to the overall material use.), Lithuania with the index of 4.8 lags behind not only the average of EU (11.7), but also Latvia (6.6) and Estonia (8.7).

Even though there is quite a lot information about the circular economy, there is not much data regarding transport and logistics, and its influence on the development of circular economy. The most directly related indicators are provided by the Eurostat, which carried out Community Innovation Survey in 2016 (CIS is a survey of innovation activity in enterprises). Yet, further provided information should be understood as indicative, because it is quite old and information was collected through a method of survey (in some cases respondents do not fully understand the questions / provides incorrect information).

In the CIS 2016, businesses were asked about the implementation of innovations in their logistics activities, including reverse logistics, digital supply chain management, inventory management systems and so on. Regarding the reverse logistics (all operations related to the re-use and return of products and materials), only 1,5 % of all businesses under Core industries (mining and quarrying, manufacturing, electricity, gas, steam and air conditioning supply, water supply; sewerage, waste management and remediation activities) applied innovations related to it (the average of the reporting countries is 3 %), the Core services sectors, which includes Wholesale trade and Transport and storage, has a result of 1,2 % (the average of the reporting countries is 2,7 %), while the result in the Transport and storage is 2,6 % (the average of the reporting countries is 2,7). In case of inventory management systems (for example automatic (& real-time) monitoring, tracking / tracing delivery of goods), situation in Lithuania is quite similar compared to reverse logistics, that is the result is lower compared to the average of other countries: the result of Core industries is 6,1 % (on average 7.8 % in other countries), the result of Core services is 6.3 % (on average 7.9 % in other countries) and the result of Transport and storage is 8 % (on average 9,6 % in other countries). Last but not least, in the context of Digital supply chain management (includes paperless, transparent supply chain transactions, manage supplier relationships, and control associated business processes), Lithuania's result in Core industries is 4.6 % (on average 5.5% in other countries), the result in Core services is 5.2 % (on average 6% in other countries), however Transport and logistics has a better result compared to other reported countries, that is 6,6% and 5,9 % respectively.

Overall, both data sets (the first set directly related to CE and the second one related to innovations in supply chain and logistics management) indicate the results in Lithuania, that are not good enough. Current transport and logistics activities have to be improved in order to have better results in the circular economy and it means, that the variety of actions have to be taken

by a variety of stakeholders, including policy makers and businesses. Of course, the sole action in transport related activities will not drastically change the situation, however the principles of circular economy can only be achieved if we will understand the importance of the transport and logistics in a circular supply chain, when we integrate circular thinking in the management of the supply chain and its related parts. Developments in the practices and business models of transport and logistics in combination with other activities in other sectors will make the transition much smoother.

5.4. Methodology

These recommendations are prepared in the framework of Interreg Europe project “RECREATE”, the goal of which is to reinforce the competitiveness of regional transport SMEs. The preparation of recommendations document follows the methodology, which was created by the Lithuanian Innovation Centre in consultation with other project partners (Coventry University Enterprises Ltd., Development Agency of South Aegean Region, Regional Development Agency South-West Oltenia). In order to prepare these recommendations, publicly available national and EU level policy documents were analysed with the aim to understand policy goals and actions in regards to circular economy and transport sector. In addition, various quantitative data and indexes were also analysed from both, national and EU level data sources in order to see the current situation of circular economy in Lithuania and how Lithuania stands in comparison with other EU states. Last but not least, desk research was also implemented, with the analysis of various analytical reports and studies. This not only provides a better understanding of the link between transport and circular economy, but also provides an opportunity to make recommendations, which are based of the scientific research and good practices from other regions.

5.5. Potential implications

According to various indicators and indices, the development of circular economy in Lithuania is not sufficient and we are still lagging behind the EU averages in various respects. However, according to the European Circular Economy Action Plan, the long-term business and country competitiveness, and transformation towards climate neutrality, as it was defined in the European Green Deal, are impossible without the implementation of CE and the contribution of transport and logistics to it. Circular economy will empower the sustainable growth, meaning that it will address societal and environmental issues, while allowing economic growth to be maintained. First of all, Lithuania and the whole EU highly depend on the raw materials, the amount of waste generated from electronics and ICT, textiles, plastics, food and packaging is on the rise, greenhouse gas emissions remain high and the energy consumption is not sufficient. In order to reach ambitious EU goals (climate neutral continent and climate neutral society), to preserve natural environment, to protect the most vulnerable groups in society, economic sectors heavily dependent on the climate, Lithuania and the other member states will have to take various actions related to climate protection and the transition to CE will be inevitable, otherwise the threats posed by climate change will have a major impact on the quality of life in various countries. In addition, business and country level ability to grow and be competitive in the international markets will also heavily depend on the adaption to CE. This process will encourage the implementation of various innovations and digital solutions, research and development activities (R&D), it will bring new cooperation opportunities for science, business and governments, public funding, brand differentiation/reputation, and a deeper relationship with existing customers. In practice, it will allow to reduce the use of raw materials and dependency on them, restore and reuse various materials, empower companies to keep processes operating at their optimal potential by using

digital solutions. Another important point is that EU and its member states are already committed to green policy and as a result, legislation, various standards and norms will change in the future. Companies that are not ready for that, will lose their market share, compared to those who will prepare for the future trends before they come. Overall, all this means, that business and country level competitiveness in the future will highly depend on the circular economy, therefore the late or unsuccessful transition will significantly affect the opportunities to further strengthen country's economy, create new jobs and address social challenges.

5.6. Recommendations

Up until now, transport and logistics value creation have been characterised by a linear flow and distribution of materials, various parts and products. In addition, we can also distinguish the type of waste disposal transportation and logistics, which focusses on processes at a product's end of life. This two-way and non-integrated linear system has two main drawbacks. First of all, the product creation process, with the added value of logistics and transport in the storage and distribution of materials and products is highly separated from the process of waste management. This gap between two different ecosystems constitutes a kind of intermediate stage that causes change of ownership and disrupts information flows between different actors. End-of-life products together with their inherent information, components and raw materials are less effectively recycled as it would be possible within in an effective circular economy. Secondly, because of this gap, it is difficult to integrate various recyclers as suppliers of high-quality secondary materials, products, components or raw materials together with manufactures, which would be willing to buy and use these materials. Taking this into account, the full potential of circular economy will be realised when the right conditions will be created and implemented for the development of green and reverse logistics.



Figure 1. Reverse logistics scheme. Source: Medium

In order to propose the recommendations on how to improve the impact of transport and logistics to the implementation of circular economy, it is important to understand the transport related concepts, their meanings and relations to CE. First of all, the most important concept is reverse logistics. The main goal here is to move goods from their point of consumption to an end point to capture value or properly dispose products and materials. In the context of circular economy,

value creation is the most important aspect, so at this point materials and products may be sent back to manufacturing, or be reused, refurbished, or recycled. Reverse logistics differs from waste management due to its focus on adding value to a product that has already been used, while waste management aims to collect and carry out treatment without producing a product. Reverse logistics is also often associated with the return of goods. Constant growth trends in sales volumes and expanding e-commerce mean that more and more products are being returned to sellers. Yet, this understanding of reverse logistics does not fully reflect the principles of reverse logistics, as at this stage we are still at the consumption level. Yet, returned products are often unfit for further consumption, therefore they might get involved in the recycling processes so the transport sector also has an important role to play here. However, to capture the full potential the reverse logistics, it is important to consider **reverse post-consumption logistics**. It is an environmental practice and, therefore, can be considered as a part of the circular economy cycle, since the waste must leave one production cycle and enter another, immediately after its generation, being reused. In addition to reverse logistics, the concept of Green logistics is also widespread. It is an umbrella term, which among others concepts also include reverse logistics. In general, it can be defined as a set of supply chain management practices and strategies, that reduce the ecological and energy footprints of the distribution of goods, which focuses in material handling, waste management, packaging and transport. Green logistic activities encompass the measurement of the environmental impact of different distribution strategies, the reduction of energy consumption in logistic activities, the reduction of the amount of waste and the management of its treatment, including its re-use. As a result, in order to promote the development and implementation of green and reverse logistics, areas of activity and related recommendations for both, policy makers and businesses can be presented.

1. Implementation of new technologies and innovations.

Development and implementation of new technologies not only directly related to the transport and logistics, but also to other economic sectors enable reverse logistics. Real time information flow and the increased transparency along the circular value chain serves as the basis to ensure a considerable circulation of post-consumer products. This is enabled by the technological trends, such as automatisisation of shipments (f. e. reverse logistics of hazardous waste); information logistics and data sovereignty (f. e. use of decentralised systems for the provision of information relevant for the processes in the circular value chain (material passport) / protection of transport documentation and respective data security); new manufacturing technologies (f. e. the use of secondary raw materials as a substitute to primary raw materials / integration of secondary raw material producers as raw material supplier in the supply chains); Industry 4.0 (f. e. transport planning within supply chain networks is done across actors and functions for an optimal use of transport capacities); social networked industry (f. e. better human-machine-interaction to improve the work efficiency such as to avoid redundant paths in waste collection). Despite the positive impact these technological trends can have on the implementation on reverse logistics and circular economy, businesses usually do not fully utilise them (it can be seen by the data of CIS 2016). On the one hand, businesses and especially SMEs do not have enough information or are not aware about the technologies, their implementation, potential partners, financing opportunities and therefore the soft support services in the form of consultations should be prioritised. On the other hand, financial barriers can also be important. For example, solutions to digitise supply chain can be very expensive, risky and create some type of uncertainty for businesses, therefore there is a need to incentivise companies to take these risks.

2. Development of technologies and innovations.

Businesses should also be encouraged to create and commercialise new innovative solutions, which would empower transport and logistics companies to be effective in the circular supply chains. Even though transport is relevant for all stages of circular economy and it unites various players in the ecosystem, there are no one-size-fits-all solutions in the market even within the same industry. As a result, there is a need to constantly analyse various value chains and create new innovative solutions. Additional demand for R&D activities are required to create new reverse logistics, inventory management systems or digital supply chain management solutions.

3. Business models.

Successful implementation of reverse logistics requires new management tools, use of different technologies, both equipment or software, exclusive competencies. Different from forward logistics, products come back not packed, they don't come back to predefined schedules, they don't even come back in the same state in which they went out and there are much more differences - this makes predictability a key challenge. Because circular economy is quite different from a traditional linear economic model, creation and implementation of new business models is an important process. These new business models are not only important for the companies operating directly in the transport and logistics, but also for those operating in other sectors, as transport is relevant for various economic activities. For example, manufacturing companies need to more closely cooperate with recycling industries and integrate them into their value chains; recycling industry will need to extend their business to new areas and also more closely cooperate with manufacturers; transport and logistics will see a decrease in the demand for the transportation of raw materials and there will be an increase for the demand of used products transportation. Thus, policy measures could be created with the goal to foster businesses to create these new business models with the integration of reverse logistics and to consult companies about the potential to apply new digital technologies, management practices, physical technologies and other know-how. Additionally, the exchange of experience and good practices how businesses apply circular business models can also be important, so support measures for participation in knowledge dissemination networks also have to be considered.

Also, one particular business model, which could be fostered by the policy makers in cooperation with business representatives is spatial clustering of industries, that are (increasingly) dependent upon each other: spatial clustering is important to create local industrial ecology supported by linking infrastructures (e.g., for local transport of reusable waste water or heat) and shared service (e.g., shared waste treatment, quality and safety control, shared local renewable energy production (wind, solar or biogas) and distribution, shared research and training institutes). Such economic geographical concentration of interrelated industries and services, (e.g., for high tech, agri-food, or chemical industries) instead of geographically uncontrolled and dispersed location of individual companies, increases the conditions for successful circular economic business models across the borders of the individual companies and thus reduces costly and inefficient transport movements.

4. Transformation of transport sector.

Transport and logistics have to become more environmentally efficient itself – transport sector is responsible for around 1/3 of GHG emissions in Lithuania (about 36 % emitted by trucks). This requires a strong focus on reducing avoidable transport, optimisation of product flows in production chains and towards the end users, the organisation of seamless and smart transport

chains using environmentally friendly transport modes that significantly reduce the energy-intensity of transport. As a result, there is a need to foster the multi-modal transport and on-demand mobility, transport electrification and various alternative fuels, autonomous vehicles used in the logistics and transportation processes.

5. Systemic thinking.

For the logistics sector, it is important to start a more systematic thinking and interaction with other industries served by them to stimulate a joint rethinking of the entire supply chain. One single link in the whole value chain can be able to more or less optimise its own production processes or services in line with the principles of circular economy, but all these individual link optimisations do not necessarily result in an optimal closed loop supply chain. As a result, a high-level cooperation and coordination is required between different actors, from the transport and logistics, industry, waste management and even consumers. Systemic thinking on a smaller scale could be initiated by individual actors in the system, yet in order to achieve a bigger scale, the role of facilitation could be taken by various business associations and structures representing different industries, clusters or even the government. The creation of ecosystem and action within it could provide new initiatives, support schemes or legislation, which would incentivise the adoption of reverse logistics practices in the whole supply and value creation chain.

6. Human capital.

Effective reverse logistics operations require highly skilled personnel. In order to gain organisational benefits from RL practices, RL experts who are personally committed and responsible for the creation and implementation of RL strategies should be placed in the organisation. Yet, due to frequent technological changes and the application of the newest innovations, personnel have to be constantly trained, however this training requires financial resources that the organisation may not possess or want to dedicate to reverse logistics, thus creating great difficulty in managing RL practices. Education and training are major requirements for success in an organisation; therefore, the more well-trained staff available, the greater the efficiency of the RL operation. From the policy point of view, the system of incentives should be created so the businesses could offer formal training for their employees.

7. Regulations.

Generally, companies can get involved in the reverse logistics if they can profit from it or because they “feel” socially motivated. Yet, the third option, why companies can get involved in the reverse logistics is because they have to do so. This can be determined by the legislation and regulations. Especially in Europe, there has been an increase of environmentally related legislation like on recycling quotas, packaging regulation and manufacturing take-back responsibility. Reverse logistics friendly regulations are vital: on the one hand regulations can create additional barriers for businesses and discourage them from potential actions, while on the other hand, if created properly they can ensure a level playing field, objectives to be achieved, and instrument how it will be reached. For example, for municipalities it is important to ensure a legislation, which would enable effective collection, segregation, processing and municipal waste reusing, because it will contribute towards efficiency improvement of the system for collecting recyclable municipal waste functions. Transport sector and logistics have to be seen not only as individual sectors, but also as those without which the empowerment of the circular economy will be incomplete. Also, due to the horizontal nature of transport in the circular economy, different governmental institutions should also be involved in the policy creation processes, yet it is important to ensure that

duplication between them would be kept to a minimum and that their activities would not interfere with each other (complementarity instead of duplication).

6. Policy recommendations – South-West Oltenia

6.1. Executive summary

There is a high potential for further development and expansion of transport-related SMEs sectors in the South-West Oltenia (SWO) region of Romania, in the next 20-30 years continuously.

The vision for the South-West Oltenia region is to become a major hub in transport related industry: automotive (passenger cars), railway vehicles (passenger trains and tramways), aircraft industry (a major plant of military industry), light electric vehicles (for urban mobility) and others.

In this respect, the region has to set up /develop a clear strategy to support and further develop SMEs that are working in the transport-related sectors, based on policy instruments, financial support programmes and schemes; the region has to take advantage of the current slight recovery in terms of industrial sectors. The strategy needs to be outlined in a holistic approach, to build up a governance support system, while the Regional Development Agency SWO's role has to be further strengthened in supporting the regional stakeholders as major players in the transport-related sectors.

Adapting to market trends and climate change is a key requirement for the transport sector in the SWO region. It must become an integral part of all activities related to the transport sector and be integrated into the daily thinking of people working in this sector. The prospect of adapting to market trends and climate change must be integrated into tendering procedures in all components of the transport sector and in infrastructure asset management systems, business plans and the improved project planning and development cycle. The starting point for this work in the transport sector is to identify the relative vulnerability of transport sector to the impacts of market trends and climate change, to define measures to be implemented in the short, medium and long term. A summary of the specific recommended measures of transport sector adaptation is provided below - with examples of factors to be considered.

6.2. Introduction

Transport-related industry in the SWO region is supported by a major automotive manufacturing company, Ford Romania, along with numerous companies producing automotive components. Ford Company is present in SWO since 2007 when it took over Craiova factory by making massive investments. Regarding the automotive component manufacturing, SWO has attracted increasingly more foreign investors in this segment, so currently there are produced automobile components in several factories in the region. Such developments have increased the turnover of the sector steadily over the period 2010-2018, and the increasing trend continues. Automotive production is almost entirely exported, its share in the total exports of the country's automobiles is important. The value of the exported vehicles is increasing, together with the increasing value of the automotive components to export. In 2010, exports related to the automotive industry were worth 1 billion Euro. In 2018, exports related to the automotive industry reached 2 billion Euro, hence a 100% increase. This automotive industry network represents a hub, a pivotal centre of transport-related industry development, which is even more developed and more innovative than Dacia hub in Pitesti.

The main factors influencing the level of Transport-SMEs in the SWO region include:

- Capacity to invest;
- Capacity to generate and bring new products and new services to the market

- Capacity to compete on the regional, national and international markets with the focus on the integration in the value chains.

Yet, by size classes of SMEs, the overall characteristic remains the low level of investments: in 2010 the investment volume of SMEs was 145 million Euro. In 2018, the investment volume by SMEs reached 160 million Euro. By comparison, FDI in SWO in 2010 was 1 billion Euro, while the FDI in 2018 reached 1.6 billion Euro. Transport SMEs are not sufficiently market-oriented to make long-term investments to enable them to grow and consolidate on the market. Transport SMEs also do not introduce new products or services. Transport-SMEs innovation capacity is one of the specific features of this sector alongside flexibility and market orientation. The success of innovative activities carried out by Transport-SMEs is reflected both in the development of markets through launching new or improved products, as well as through the improvement and innovation in the field of organisational and technological processes specific to each company, including the distribution processes. Innovation in transport sectors is still deficient in terms of adopting new technologies that enable companies to meet market demands.

Low level of business investments and innovation are determined by a lot of factors. One of them is the gap in transport SMEs financing. The usual option for Transport SMEs entrepreneurs was to borrow money from their local banks. As borrowing has become too expensive, transport SMEs tend to hold on to their investments until an improvement in the economic conditions. This is detrimental to the economic growth and innovation. The financial landscape has changed dramatically and Transport SMEs would need to broaden their horizon for financing and use new tools like crowdfunding and microfinance.

Transport SMEs have to explore the new range of financing mechanisms. Compared to larger companies, transport SMEs are much more vulnerable to funding shortages due to the lack of capital buffers and resources, and the lack of internal diversification. Transport SMEs rely mainly on bank financing in the form of short- and long-term loans to provide working capital and to finance future growth. But their loan applications are often rejected by their banks, leaving them more dependent on their own means or even causing financial distress.

Lack of qualified personnel is also a big issue for businesses in the region. Many transport SMEs are reporting difficulty in recruiting staff in general, and they are having more trouble finding skilled workers. It's not surprising that capable employees are harder to find as the pace of hiring picks up and the unemployment rate drops. But would-be employees just don't appear to be the right fit for many of the open positions. The main reasons for having difficulty filling open jobs are:

- a low number of job applicants;
- a lack of needed work experience;
- competition from other employers;
- a shortage of technical skills;
- a shortage of qualified candidates in local markets.

Collaboration with public administration can also be considered an important issue in the region. In many occasions, the collaboration between transport SMEs and public authorities is really difficult. Public authorities should be proactive in supporting the transport SMEs by enabling them doing business in a free and stimulating ecosystem. Excessive bureaucracy imposes a disproportionate bureaucratic burden on transport SMEs, creating both incentives and opportunities for bribery and corruption. This can manifest itself in the form of excessive or overly rigid administrative procedures, requirements for unnecessary licences etc that are

slowing down business operations. The difficult collaboration with public authorities has a particularly negative effect on transport SMEs in export-oriented sectors such as manufacturing and the automotive industry.

A weak collaboration between universities / research centres and transport SMEs is another key issue in SWO. Region is lagging behind in terms of innovation even though it includes many active research units. The region's aim is to bridge the gap between R&D creators, producers, financiers and transport SMEs marketers by creating a mechanism that facilitates the valorisation of research results.

- Low-level accessibility of R&D results by transport SMEs, due to internalities of research efforts;
- Weak knowledge transfer mechanisms among researchers and transport SMEs;
- Lack of policies for creating links between science and the transport SMEs sector;
- Fail to meet a critical mass of R&D results for transport SMEs due to isolation and lack of interregional cooperation.

There is a need to create sustainable links between the transport SMEs sector and the academia through market driven actions facilitating access and support to R&D results.

In the current context of financial and economic conditions, the various factors such as increased risk aversion, decreased liquidity, bleak prospects for economic growth, etc. have a highly negative effect on transport SMEs and entrepreneurs' access to short and long – term growth.

Transport-SMEs are particularly vulnerable because:

- It is more difficult for transport SMEs to downsize -since they are already small-,
- SMEs are individually less diversified in their activities,
- SMEs have weaker financial structures or lower capitalisation,
- SMEs have lower credit ratings,
- SMEs are heavily dependent on credit,
- SMEs have fewer options for finance, especially in financial markets;
- It is difficult for SMEs in the transport sector to find the right workforce
- SMEs find it difficult to collaborate with public sector, science and research organisations

6.3. Results

The current situation is reflected in the results recorded by the Transport-related SMEs in the South-West Oltenia region.

Transport SMEs difficult access to finance is an obstacle to the current operation of the firms. A significant negative correlation has been revealed between the level of financing constraint and the SMEs' size which implies that smaller firms experience more severe financing problems than larger firms.

High start-up price for SMEs, together with licensing and registration requirements has the likelihood to impose extreme and needless burden on Transport SMEs.

Transport SMEs have difficult access to international markets through their lack of access to human resources, to external markets and to technology.

On the whole, Transport SMEs face multiple difficulties and are suffering major obstacles and barriers that make them disadvantaged in the fierce business competition.

6.4. Methodology

The recommendations are based on the methodology developed within the Interreg Europe project “RECREATE”, the goal of which is to reinforce the competitiveness of regional transport SMEs. The preparation of recommendations document follows the methodology, which was created by the Lithuanian Innovation Centre in consultation with other project partners (Coventry University Enterprises Ltd., Development Agency of South Aegean Region, Regional Development Agency South-West Oltenia).

To conduct these policy recommendations, desk research of relevant literature and data sources on transport SMEs and innovation was conducted. Analysed data sources included Eurostat, Smart Specialisation Platform, Strategic Transport Technology Plan, ERAWATCH, European Science Foundation, CORDIS, INTERREG Europe platform, regional and national websites in partner countries, key policy documents, RIS3 for partner region, Regional Development Plan for partner region, other national & regional strategies. Also, data from stakeholder group meetings and discussions was used.

6.5. Potential implications

The development of transport SMEs and business ecosystem was quite fast in the region. Along with the development of bigger companies in the region, SMEs operating in the automotive sector have also started to expand. However, companies are currently under increasing pressure to adapt to various emerging trends, such as digitisation or green transformation. In order to meet the emerging opportunities, companies face the challenges which were presented above. Therefore, in the long – term transport SMEs and the whole ecosystem in the region may face significant difficulties:

- companies will not respond to the global trends and lose their competitiveness;
- difficult situation of transport related SMEs in the SWO region might worsen and these SMEs might get into deeper economic & financial crisis;
- economic growth and job creation in the region will be adversely affected

6.6. Policy recommendations

1. The **institutional framework and operational environment** for transport-related SMEs in the SWO region has substantially improved, with, e.g., the adoption of a new SME definition, the formalisation of platforms for public-private dialogue on business-related policies and laying the groundwork for Regulatory Impact Assessments (RIA). Building on these achievements, the introduction of SME-specific RIA tests could help the region to better anticipate the potential impact of draft legislation on transport SMEs. Moreover, attention should also be drawn to carrying on the various activities aimed at improving business closure and insolvency procedures.

2. **Access to finance** for transport-related SMEs in the SWO region should be made easier. It should be facilitated based on changes in the legal framework allowing the provision of grants to commercial entities, an increase in the financial support offered by state agencies and the implementation of a multitude of financial education initiatives. However, a more co-ordinated approach to financial education could better address the specific needs of small and medium entrepreneurs, while also facilitating the adoption of international financial reporting standards. In

addition, the creation of a full-fledged credit guarantee scheme and the development of alternative financing tools could reduce the burden of currently heavy collateral requirements on SMEs.

3. The SWO region has to improve in the fields of skills development **and entrepreneurial culture**; skills needs anticipation, the involvement of employers in setting education and training standards, and the introduction of mandatory entrepreneurship modules in vocational education and training curricula. The adoption of a strategic framework for entrepreneurship could help SWO close the gap in this regard; but emphasis should be put on the implementation, monitoring and evaluation of the other various activities underway to effectively assess their impact.

4. Considering to setting-up **targeted financial support to transport-related SMEs**, the regional authorities should have in view providing additional targeted financial and logistic support to help SMEs overcome the financing barriers to exporting and the risks encountered, such as longer cash-flow cycles, physical distance from buyers and currency risk, when engaging in international trade.

As a first step, consultations among authorities, financial institutions and exporting SMEs should be held regularly, as well as surveys carried out, in order to identify specific barriers and needs for further internationalisation/export development. Depending on the needs identified among transport SMEs in SWO region, financial solutions could include export loans to finance additional working capital, export credit insurance to cover market and political risk, as well as export factoring to convert exporters' trade receivables in discounted liquidity. Awareness raising campaigns promoting the availability of transport SME targeted trade finance instruments, as well as export-related finance and insurance skills trainings such as export risk management, should be considered an integral part of the proposed financial solution.

5. To improve competitiveness of transport SMEs and to help them to succeed in the EU market, the policy makers should support transport SMEs, by promoting the formation of clusters in Transport sectors. Clusters can increase productivity, contribute to more rapid innovation and new business formation through co-operative research, sharing knowledge and infrastructure, and optimising costs in accessing inputs, marketing and distribution. This initiative offers promising signs, with strong interest from regional stakeholders and entrepreneurs. Several clusters have already been formally registered, with a management structure in place.

6. Important steps have to be taken to facilitate **transport-related SMEs' innovation and R&D activities**, by, e.g., allowing public universities and research centres to own spin-off companies and increasing financial support for innovation and expanding the statistical base on companies' use of ICT and innovation activities. The adoption of a more strategic approach towards transport-related SME innovation, including dedicated instruments to ensure better and more effective implementation of priority actions, would facilitate SWO region's shift towards a knowledge and innovation-based economy.

In response to policy changes impact on the transport SME development, recommendations are defined along three pillars – implementation, results and impact – to improve the current situation of transport SMEs:

- **Implementation** of the transport SME policy recommendations should be facilitated by setting targets for quantitative indicators. More user-friendly tools for the annual progress would make it possible to enhance the communication value of the document.
- **Results** would benefit from Key Performance Indicators for each strategic direction to clearly indicate the progress level of intended results. The regional periodic analysis report could include a section reporting on these results, which will facilitate the revision and upgrading of the transport SME policy recommendations for the future.

- **Impact** could be strengthened by adding a specific transport SMEs section to the periodic regional analysis report, comparing current target values with past trends, reflecting changes in the context of the overall economic cycle in Transport sectors, by reporting on changes recorded by Transport SMEs in the overall business results level of the South-West Oltenia region.

7. Analysis of policy recommendations

Mobility and transport sector is an enabler of our economic and social life. From daily commuting to work, visiting family and friends, tourism, to the proper functioning of global supply chains for the goods in our shops and for our industrial production, transport sector is a key player. As the second-largest area of expenditure for European households, the transport sector contributes 5% to European GDP and directly employs around 10 million workers.

Despite its significant positive impact on societies and the economy, transport sector is characterised by large **negative externalities** (cost that is suffered by a third party as a consequence of an economic transaction). According to the calculations in the EU, external costs due to transport have been evaluated to be approximately 4 % of GDP in 2011.¹ Some of the negative externalities caused by the transport includes:

- **Transport accidents**, causing injuries and sometimes death. In statistical terms, some means of transport are more dangerous than others. Private cars for example, are the biggest cause of transport accidents.
- **Transport congestion**, which is costing a lot in terms of missed turnover or extra costs due to delays or resulting stress. Here again, road transport is more subject to congestion than other modes.
- **Noise pollution** remains a major environmental health problem in Europe, with the transport sector being a major cause. Road traffic noise is the dominant source affecting human exposure above the EU's threshold of 55 decibels (dB) for daily exposure and 50 dB for night exposure. Around 100 million people are exposed to road traffic noise above 55 dB in the 33 member countries of the European Environmental Agency.
- **Poor air quality** with an impact on people's health is also caused by transport, especially the NO_x and particulate matters contained in fossil fuels, especially diesel. In fact, these are causing far more premature deaths than accidents.
- **CO₂ emissions** which are responsible for climate change also come from a big part from transport. There are also emissions resulting from the production of vehicles, impacts in terms of space dedicated to roads, tracks, airports etc. In 2017, 27 % of total EU-28 greenhouse gas emissions came from the transport sector. Emissions from transport in 2017 were 28 % above 1990 level, despite a decline between 2008 and 2013.

Taking all this into account, on 9 December 2020, the European Union issued its new **Sustainable and Smart Mobility Strategy – putting European transport on track for the future**. According to this document, all transport modes need to become more sustainable, with green alternatives widely available and the right incentives put in place to drive the transition. Concrete milestones will keep the European transport system's journey towards a smart and sustainable future on track:

By 2030:

- at least 30 million zero-emission cars will be in operation on European roads;
- 100 European cities will be climate neutral;
- high-speed rail traffic will double across Europe;
- scheduled collective travel for journeys under 500 km should be carbon neutral;

¹ Transport in the European Union, <<https://ec.europa.eu/transport/sites/default/files/2018-transport-in-the-eu-current-trends-and-issues.pdf>>

- automated mobility will be deployed at large scale;
- zero-emission marine vessels will be market-ready;

By 2035:

- zero-emission large aircraft will be market-ready;

By 2050:

- nearly all cars, vans, buses as well as new heavy-duty vehicles will be zero-emission;
- rail freight traffic will double;
- a fully operational, multimodal Trans-European Transport Network (TEN-T) for sustainable and smart transport with high – speed connectivity.

To make this vision a reality, 3 priority topics with 10 flagship areas for action were selected.

1. SUSTAINABLE MOBILITY – AN IRREVERSIBLE SHIFT TO ZERO-EMISSION MOBILITY.

The European Green Deal calls for a 90% reduction in greenhouse gas emissions from transport, in order for the EU to become a climate-neutral economy by 2050, while also working towards a zero-pollution ambition. For transport to become sustainable, in practice this means:

- Boosting the uptake of **zero-emission vehicles, vessels and aeroplanes, renewable & low-carbon fuels and related infrastructure** – for instance by installing 3 million public charging points by 2030.
- **Creating zero-emission airports and ports** – for instance through new initiatives to promote sustainable aviation and maritime fuels.
- **Making interurban and urban mobility more sustainable and healthy** – for instance by doubling high-speed rail traffic and developing extra cycling infrastructure over the next 10 years.
- **Greening freight transport** – for instance by doubling rail freight traffic by 2050.
- **Pricing carbon and providing better incentives for users** – for instance by pursuing a comprehensive set of measures to deliver fair and efficient pricing across all transport.

2. SMART MOBILITY – ACHIEVING SEAMLESS, SAFE AND EFFICIENT CONNECTIVITY.

People should enjoy a seamless multimodal experience throughout their journey, through a set of sustainable mobility choices, increasingly driven by digitisation and automation. As innovation will shape the mobility of passengers and freight of the future, the right framework and enablers should be in place to facilitate this transition that can make the transport system much more efficient and sustainable. In practice, these goals have to be achieved by:

- Making **connected and automated multimodal mobility** a reality – for instance by making it possible for passengers to buy tickets for multimodal journeys and freight to seamlessly switch between transport modes.
- Boosting **innovation and the use of data and artificial intelligence (AI)** for smarter mobility – for instance by fully supporting the deployment of drones and unmanned aircraft and further actions to build a European Common Mobility Data Space.

3. RESILIENT MOBILITY – A MORE RESILIENT SINGLE EUROPEAN TRANSPORT AREA: FOR INCLUSIVE CONNECTIVITY.

Transport has been one of the sectors hit hardest by the COVID-19 pandemic, with damage stemming from the huge negative demand shocks following the necessary containment and mitigation measures. This has given rise to supply chain disruptions, steep reductions in foreign and domestic travel and tourism, and reduced connectivity

across the EU as a whole. This has also resulted in immense operational and financial difficulties for many businesses active in the transport sector, many of them small and medium-sized enterprises (SMEs). This strategy must help the sector and relevant ecosystems such as travel and tourism bounce back better from this crisis and become greener, smarter and more resilient. Therefore, European Commission commits to:

- **Reinforce the Single Market** – for instance through reinforcing efforts and investments to complete the Trans-European Transport Network (TEN-T) by 2030 and support the sector to build back better through increased investments, both public and private, in the modernisation of fleets in all modes.
- Make **mobility fair and just for all** – for instance by making the new mobility affordable and accessible in all regions and for all passengers including those with reduced mobility and making the sector more attractive for workers.
- Step up **transport safety and security** across all modes – including by bringing the death toll close to zero by 2050.

Within this ambitious plan, EU has committed itself to 82 different actions between 2020 and 2025. The examples of certain actions are shown in the table below.

Table 2. Examples of actions under Sustainable and Smart Mobility Strategy - putting European transport in track for the future.²

Action	Year of implementation
Establish sustainable taxonomy criteria for all modes	2021
Issue guidelines for operators and platforms on informing users about the carbon footprint of their deliveries and on offering sustainable delivery choices	2023
Adopt the implementing legislation for the approval of connected and automated vehicles	2021
Set out an AI roadmap for mobility	2021
Propose rules on a trusted environment for corridor data exchange to support collaborative logistics	2022
Establish a scheme under the cybersecurity certification framework for automated vehicles	2023

The European Union’s plan, operational objectives and measures clearly indicate the problem areas in which nation states must continue to work. Actions at the EU level is necessary but not sufficient condition to tackle various negative externalities, produced by the transport sector. As a result, targeted and timely implemented policy changes and measures by a national or regional authorities should also be a priority.

7.1. Consistency of policy recommendations with the objectives of the EU transport policy

Sustainable, smart and resilient transport sector and mobility are different topics, yet at the same time they are highly interconnected and reinforce each other. In fact, they are not a completely new themes and there are many different definitions of them. In general, they can be described as follows:

² Sustainable and Smart Mobility Strategy – putting European transport on track for the future, < https://eur-lex.europa.eu/resource.html?uri=cellar:5e601657-3b06-11eb-b27b-01aa75ed71a1.0001.02/DOC_2&format=PDF>

- **Sustainable** transport and mobility refer to the broad subject of transport that is sustainable in the senses of social, environmental and climate impacts. Components for evaluating sustainability include the particular vehicles used for road, water or air transport; the source of energy; and the infrastructure used to accommodate the transport (roads, railways, airways, waterways, canals and terminals). Transport operations and logistics as well as transit-oriented development are also involved in evaluation. Transportation sustainability is largely being measured by transportation system effectiveness and efficiency as well as the environmental and climate impacts of the system.
- **Smart** transportation, by definition, is an approach that incorporates modern technologies into transportation systems. This includes cloud computing, wireless communication, location-based services, computer vision, and other tools to enhance mobility. In order to have smart transport, intelligent transportation systems, such as connected cars, mobility-as-a-service, autonomous vehicles, and other have to be integrated and work as a whole to achieve the best results. The benefits of such systems include better safety, accessibility and sustainability.
- Transport **resilience** is defined as the ability of a transportation system to move people or goods around in the face of one or more major obstacles to normal function. On a strategy level, it means a transportation system is created to accommodate future growth and possible changes to future usage or access patterns. In general, resilience is defined as a system's ability to continue to function at an acceptable level of efficiency in the face of disruptive or unexpected conditions.

These topics are particularly relevant for West-Midlands, South Aegean, South-West Oltenia regions and Lithuania. Within policy recommendations dedicated to these areas, all EU-wide issues more or less are raised. However, particular topics in the policy recommendations prepared by the project partners stands out more compared to others.

Two distinct themes in the policy recommendations prepared for the **West-Midlands region** are **smart** and **resilient** transport. Transport sector currently faces many different challenges, which pose serious issues to remain an innovation leader. Rapid technological change force companies to adapt quickly by implementing new technologies, business models, retrain human resources. On the other hand, public support organisations and education institutions must also respond to changes as quickly and effectively as possible. Last but not least, government, both at regional and local level must shape their policies and measures in such a way that they do not disrupt but encourage further growth in the sector.

Region's transport sector competitiveness, growth and longevity depends on many different factors, but first of all it has to remain innovative and at the same time resilient to future internal and external shocks. Taking this into account, policy recommendations for the West-Midlands region respond to these elements. Proposed actions include improvements in the business support environment, collaboration and clustering, internationalisation, intellectual property rights and human resources. All of this should help transport companies in the region to become more connected and automated, AI and data driven, and also more resistant to any disruptions.

In case of **South Aegean region**, policy recommendations are mostly focused on **sustainability** and **resilience**. Because the region is made up of different islands, local people and tourists highly depends on local SMEs that in general are not innovative. On the other hand, transport sector, which is almost completely consisting of SMEs, has to deal with limited resources, remoteness,

susceptibility to natural disasters, excessive dependence on international trade and tourism. So far, the transport sector's sustainability and resilience are threatened by the restrictions that the sector faces due to high communication, energy and transportation costs, irregular international transport volumes, disproportionately expensive public administration and lack of infrastructure.

Business digitisation could help to solve some of these issues, yet lack of innovation (both in terms of development and deployment) hinders the development of this sector. Yet, proposed recommendations on business environment and innovation policies, clusters and entrepreneurship, ICT policy should help this region become more environmentally friendly, while transport sector could become more accessible and resilient.

Sustainability is the major topic tackled by the recommendations dedicated to **Lithuania**. The linear economic model is gradually losing its relevance as the principles of the circular economy become increasingly important. Along with these changes, transport related principles such as green logistics and reverse logistics are emerging. However, business in Lithuania use few technologies to help implement these principles. Realising that transport is an integral part of value creation by combining different activities, the implementation of circular economy is difficult to achieve without the contribution of this sector.

For this reason, policy recommendations for Lithuania are intended to encourage sustainability in general, while transport sector should play a key role in this transformation. Lithuania must create favourable conditions for the development and implementation of new logistics principles, such as green and reverse logistics. Policy recommendations respond to these aspirations by describing potential areas of activity, including innovation ecosystem, business models, human capital, regulations and others.

Last but not least, policy recommendations for **South-West Oltenia region** mostly focuses on the **smart** and **sustainable** transport. Adapting to market trends and climate change is a key requirement for the transport sector in SWO region. To achieve this, companies in the region must increase their investments in development and innovation. However, there are many reasons hindering this process, including gaps in financing measures, lack of human capital, low level of collaboration with public administration, science and business support organisations.

As a result, policy recommendations are dedicated to support and improve regional innovation ecosystem, which could latter help businesses to succeed in relation to global business trends. Improvements in the institutional framework, access to finance, better human capital and new targeted innovation support schemes for SMEs should allow region to reach its goals to become smart and resilient.

Despite the differences, these are the key points and observations how transport sector should be supported:

- **Specific and targeted support for the transport sector.** Transport sector is very broad, combining different economic activities and enabling them to function fully. Yet, companies in the sector have certain distinctions that require specific knowledge and exceptional support, which may be less relevant for companies in other sectors.
- **Access to finance.** Further development of the businesses depends on many factors, including the availability of financial support. Some companies are not fully informed or unaware of possible financial support. Other companies are aware of the possible financing instruments, but do not use them or cannot use them for various reasons. In this context, it is necessary to create favourable conditions for companies to benefit from

external financial support in the shortest possible time, with as little bureaucracy and as little cost as possible.

- **Support for innovations.** In today's economic climate, the creation and implementation of innovations, regardless of their type, is the key to enable companies to increase their competitiveness. Because innovation related activities are highly risky and expensive, the goal of business support structures is to share these risks with the business, thus creating greater incentives to innovate.
- **Skills gap.** Transport is an industry undergoing significant change, not least due to technological transformation and access to data. This poses important questions regarding the future of work in the sector and its continued productivity. In order to stay ahead of the curve and extract optimal benefits from these changes we need to ensure that we have an appropriately skills workforce. For this reason, the goal of government, educational organisations, and business must be to promote education that meets the challenges of the future, enabling employees to find work and employers to hire employees.
- **Cooperation.** This element can be seen from two perspectives. On the one hand, it is important to ensure business cooperation with public institutions or science organisations. Decisions that respond to business needs can only be made when business and government work together and listen to each other's needs. The same could be said about science-business cooperation. The two sides must find common ground in order to make mutual cooperation as effective as possible. On the other hand, businesses have to cooperate with each other. Business clusterisation is a particularly important element, which has to be fostered.
- **Internationalisation.** International business cooperation, joint projects between business and research organisations in different countries, and the promotion of exports are activities that must be encouraged as much as possible. Integration into international networks allows businesses to increase their innovativeness, productivity, and contribute to better performance.

8. Conclusions

The Policy Recommendations report provides in detail recommendations about how transport sector should be supported in the project partners regions and how particular issues related to this sector should be solved. From the policy recommendations, it can be seen that the transport sector faces a variety of issues, related to business competitiveness, innovation, internationalisation and others. In addition, the transport sector is facing major changes that are being shaped by new technological processes, changes in the economy and social life. Still, the policy recommendations between the different partners, while responding to different challenges, are quite similar, which means that different problems and challenges can be addressed through a quite similar package of measures. Also, most of the policy recommendations are also highly related to the context of the European transport policy, whose main objectives are sustainable, smart and resilient transport.

Exchange of experiences and good practices is one of the key principles under which Interreg Europe operates. By analysing what issues others regions have to deal with and what are their policy recommendations, project partners will be able to use these examples as an inspiration to understand how their local issues and gaps in transport ecosystem could be solved. This also could be particularly important for various stakeholders related to transport sector, including government or business support organisations, as this document also not only presents recommendations, but also introduce different topics and challenges.

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